NEW MEXICO ENVIRONMENT DEPARMENT
SURFACE WATER QUALITY BUREAU

USE ATTAINABILITY ANALYSIS FOR STREAM REACHES IDENTIFIED AS EPHEMERAL THROUGH APPLICATION OF THE HYDROLOGY PROTOCOL

AUGUST 2013

SUMMARY

The New Mexico Environment Department (Department) conducted a Use Attainability Analysis (UAA) to determine the most protective attainable aquatic life and contact uses for six (6) stream reaches located throughout New Mexico (**Table 1, Figure 1**). This UAA is based on the *Hydrology Protocol for the Determination of Uses Supported by Ephemeral, Intermittent, and Perennial Waters* (NMED 2011) and follows the procedures described in Subsection C of 20.6.4.15 NMAC. This UAA concludes that four (4) of the evaluated stream reaches in the Pecos River basin, Tularosa closed basin and the Mimbres closed basin are naturally ephemeral, and that the designated uses applicable to 20.6.4.97 NMAC are appropriate and attainable. Attainment of the CWA §101(a)(2) uses for these ephemeral waters is not feasible due to the factor identified in 40 CFR 131.10(g)(2): *natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use*. The Department proposes these four stream reaches for inclusion in 20.6.4.97 C. NMAC as ephemeral waters.

Table 1. Evaluated Stream Reaches

REACH NAME	WQS for PERENNIAL REACHES	HYDROLOGICAL STATUS as determined by this UAA	SUPPORTING DOCUMENTS
Pecos River basin			
Aqua Chiquita from Rio Peñasco to McEwan Canyon	20.6.4.208*	naturally ephemeral	Appendix B
Grindstone Canyon from Grindstone Reservoir to headwaters	20.6.4.209*	naturally ephemeral	Appendix C
Tularosa closed basin			
San Andres Canyon	20.6.4.801*	naturally ephemeral below South San Andres Canyon	Appendix D
Mimbres closed basin			
San Vicente Arroyo from Mimbres River to Maudes Canyon	20.6.4.803*	naturally ephemeral	Appendix E
Salt closed basin			
Sacramento River below Scott Able Canyon	20.6.4.805	Intermittent and ephemeral	Appendix F
Scott Able Canyon	20.6.4.805	Perennial and ephemeral	Appendix F

*Perennial reaches, if any, would be classified; however, this UAA concludes that there are no perennial portions within the evaluated reach.

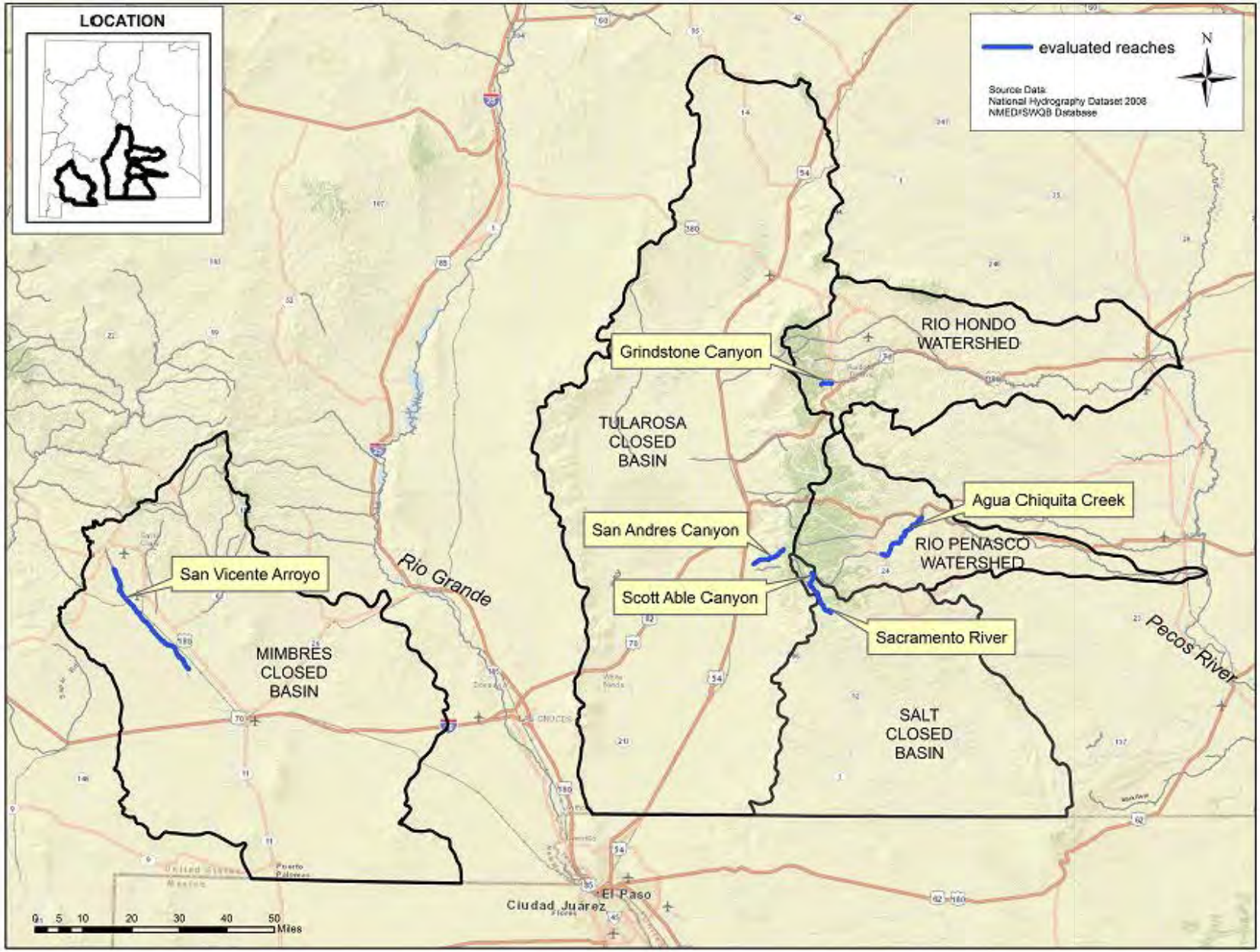


Figure 1. Locations of evaluated stream reaches

BACKGROUND

The Clean Water Act (CWA) §101(a)(2) and 20.6.4.6 NMAC require that wherever attainable, water quality shall provide for the protection and propagation of fish, shellfish and wildlife and for recreation in and on the water. Accordingly, federal regulation at 40 CFR 131.10(j) effectively establishes a rebuttable presumption that CWA §101(a)(2) uses (i.e., 'fishable, swimmable' uses) are attainable. In order to remove a §101(a)(2) use or change the use to one with less stringent criteria, a state must provide a Use Attainability Analysis (UAA) demonstrating that the use is not attainable due to one or more of the six factors listed in 40 CFR 131.10(g) (Appendix A), and to determine the most protective aquatic life and contact uses that are attainable. New Mexico's UAA procedure is described in 20.6.4.15 NMAC.

In New Mexico, surface waters not included in a classified Water Quality Standards segment (20.6.4.101-899 NMAC) are considered unclassified waters of the State (20.6.4.97-99 NMAC). Applicable standards for unclassified waters depend on the existing hydrologic condition of the water body; i.e., 20.6.4.97 for ephemeral, 20.6.4.98 for intermittent and 20.6.4.99 for perennial waters. The designated uses for ephemeral waters in 20.6.4.97 are limited aquatic life, secondary contact, wildlife habitat and livestock watering. For the limited aquatic life use, the acute aquatic life criteria of Subsection I and J of 20.6.4.900 apply. Chronic aquatic life criteria do not apply unless adopted on a segment-specific basis. Human health-organism only criteria apply only for persistent pollutants unless adopted on a segment-specific basis. By default, unclassified non-perennial waters are subject to 20.6.4.98 NMAC with the designated uses of primary contact, marginal warmwater aquatic life, wildlife habitat and livestock watering; the first two of which are CWA §101(a)(2) uses. Specific waters may be placed in 20.6.4.97 NMAC if a UAA confirms that the water is ephemeral and that §101(a)(2) uses are not attainable due to one of the factors listed in 40 CFR 131.10(g). Springs are separate hydrological features and are not included with any specific water listed in 20.6.4.97 NMAC.

The *Hydrology Protocol for the Determination of Uses Supported by Ephemeral, Intermittent, and Perennial Waters* (HP) is a methodology used to distinguish among ephemeral, intermittent, and perennial streams and rivers in New Mexico. The HP is described in detail in Section II.C and Appendix C of *New Mexico's Water Quality Management Plan and Continuing Planning Process* (WQMP/CPP) (NMED 2011). The HP evaluates the hydrological, geomorphic and biological indicators of the persistence of water, and thus indicates the aquatic life and contact uses supported by those waters as a result of the flow regime.

The HP is organized into Level 1 and Level 2 Evaluation. Data gathered during the **Level 1 Evaluation** are usually adequate to indicate the hydrological status of the stream. If the Level 1 Evaluation is inconclusive, the **Level 2 Evaluation** may be conducted. The Level 1 Evaluation includes both **office** and **field** procedures.

Office procedures may utilize geographic information system (GIS) based mapping to analyze aerial photos, topographic maps and landscape-level attributes such as ecoregions, geology, soils and vegetation. Aerial photos show impoundments, riparian (streamside) vegetation, and the presence or absence of water in the channel. Topographic maps show elevation breaks and channel constraints that could indicate a change in hydrology. Ecoregions (Griffith et al., 2006)

are large geographic areas that represent ecosystem variations. Each ecoregion is characterized by a certain elevation, air temperature, precipitation, terrain, geology, soils, vegetation and fauna. Ecoregion breaks indicate a significant change in landscape-wide characteristics including hydrology. Wells and surface diversions recorded with the New Mexico Office of State Engineer (NMOSE) are reviewed for possible effects on surface flow in the water body. Permitted wells and surface diversions recorded with the New Mexico Office of State Engineer are mapped in relation to each evaluated stream reach (NMOSE 2013). National Hydrography Dataset (NHD) shapefiles are used to depict stream channels on site location maps. Permitted discharges (NPDES permits) are identified and mapped to evaluate effects on flow. Meteorological data are reviewed to ensure that extreme drought conditions or precipitation events do not bias the field results. Drought conditions are appraised using the 12-month Standardized Precipitation Index (SPI), an index that expresses the standardized probability of recording a given amount of precipitation at a given location. There are several such indices available. For HP evaluations, NMED generally uses the SPI from the National Drought Mitigation Center (NDMC) and the High Plains Regional Climate Center (HPRCC) (NDMC 1995). An index value of zero indicates the median precipitation. A negative index value indicates below normal precipitation, and less than -1.5 is considered drought conditions.

Field procedures are conducted on-site and data recorded on the *Hydrology Determination Field Sheet* ("Field Sheet"). The office procedures confirm the homogeneity throughout the evaluated stream reach, and thus the applicability of the HP results throughout the reach. Results of the complete evaluation are documented in the *Cover Sheet for the Hydrology Protocol UAA for an Ephemeral Stream* ("Cover Sheet").

Results of the HP may be used as technical support for a UAA, and are a required component of the UAA process for ephemeral waters as described in Subsection C of 20.6.4.15 NMAC. Under these procedures, the Department posts the UAA on its water quality standards website and notifies interested parties of a 30-day public comment period. The Department then submits the UAA, with any revisions and responses to comments, to EPA Region 6 for technical approval. If EPA grants technical approval, these waters are subject to the water quality standards in 20.6.4.97 NMAC for implementation under the CWA. The Department then petitions the WQCC at a later date to specifically itemize these waters by name in Subsection C of 20.6.4.97 NMAC.

METHODOLOGY

The Department conducted a UAA for six (6) stream reaches (*see* Table 1) following the procedures described in Subsection C of 20.6.4.15 NMAC. Historical observations indicate that these waters may be ephemeral, but are currently unclassified (*see* 20.6.4.98-99 NMAC) or potentially classified, e.g., "perennial reaches of…" or "perennial tributaries to…" (*see* 20.6.4.101-899 NMAC).

Office and field procedures for the HP Level 1 Evaluation were completed for each reach. GIS was used to map stream channels, permitted wells and diversions, and permitted discharges; and to analyze aerial photos, topographic maps, ecoregions, geology, soils and vegetation. The SPI was applied for the 12-month period prior to application of the HP field procedures to identify

drought conditions. NMED conducted HP field procedures in 2012 and 2013 at the following locations:

- **Aqua Chiquita Creek (Figure B-1)**
  2012- above the confluence with the Rio Peñasco
  2013- 10 miles above the Rio Peñasco, at McDonald Flats Road

- **Grindstone Canyon (Figure C-1)**
  2012- above Grindstone Reservoir

- **San Andres Canyon (Figure D-1)**
  2012- 1.75 miles above Taylor Ranch Road, at the canyon outlet
  2013- 2.75 miles above Taylor Ranch Road, below Hackberry Spring

- **San Vicente Arroyo (Figure E-1)**
  2013- 5 miles below Maudes Canyon, at Ridge Road
  2013- 6.5 miles below Maudes Canyon, at Tyrone Road

- **Scott Able Canyon (Figure F-1)**
  2012- 0.75 miles above the Sacramento River, at the Scott Able trailhead
  2013- 1.75 miles above the Sacramento River, above the Scott Able Road crossing

- **Sacramento River (Figure F-1)**
  2012- 7 miles below Scott Able Canyon, below the community of Timberon
  2013- 1 mile below Scott Able Canyon

QUALITY CONTROL

Department staff performed one replicate of the HP field procedure for Scott Able Canyon in 2013 at the same location evaluated by other Department staff in 2012 (**Appendix F**). Although scores differed, both results indicated ephemeral. According to the HP protocol, if the sum of the first 6 indicators is less than or equal to 2, the stream is determined to be ephemeral and the evaluation may be stopped. If the sum is greater than 2, the evaluation must be continued. The 2013 QC score was 3, therefore the evaluation was continued resulting in a score of 8 (ephemeral).

RESULTS AND DISCUSSION

Results of each evaluated reach are documented in Appendices A-F. The HP Level 1 evaluations determined that the following four stream reaches are naturally ephemeral:

- **Aqua Chiquita from the Rio Pe¶asco to McEwan Canyon (Appendix B)**

- **Grindstone Canyon from Grindstone Reservoir to headwaters (Appendix C)**

- **San Andres Canyon below South San Andres Canyon (Appendix D)**

- **San Vicente Arroyo from the Mimbres River to Maudes Canyon (Appendix E)**

The HP Level 1 evaluations determined that the following two stream reaches are *not* ephemeral throughout:

- **Sacramento River below Scott Able Canyon (Appendix F)**

The Sacramento River is eight miles long from Arkansas Canyon below Timberon to Scott Able Canyon. An ecoregion break occurs below Arkansas Canyon. Characteristics are homogenous from Arkansas Canyon to Scott Able Canyon. The Department performed the HP field procedure in 2012 below the community of Timberon. The result indicated that this section of the stream was ephemeral. The following year, the Department applied the HP field procedure below Scott Able Canyon, six miles upstream from the 2012 location. The result here indicated that this upper section was intermittent.

- **Scott Able Canyon (Appendix F)**

Scott Able Canyon is 2.8 miles long from the Sacramento River to the head of the canyon, where a break in topography, geology and vegetation occurs. The canyon is homogenous below this point. Scott Able Road crosses the channel approximately 1.5 miles from the Sacramento River. The Department performed the HP field procedure in 2012 and 2013 below this road crossing. Results both years indicated that this section of the stream was ephemeral. The Department also applied the HP field procedure in 2013 above the road crossing, one mile above the previous location. Results indicated that this upper section of the stream was perennial. Staff documented several pools and substantial evidence of recent perennial surface flow.

CONCLUSION

This UAA demonstrates that four of the evaluated stream reaches listed in Table 1 are naturally ephemeral, and that the designated uses described in 20.6.4.97 NMAC are appropriate and attainable. The UAA finds that it is not feasible to attain the designated uses of marginal warm water and primary contact because of factor 131.10(g)(2): *Natural, ephemeral or intermittent or low flow conditions or water levels prevent the attainment of the use.* These four stream reaches are proposed for inclusion in 20.6.4.97 NMAC as ephemeral waters, following the procedures described in Subsection C of 20.6.4.15 NMAC.

REFERENCES

Griffith, G.E., Omernik, J.M., McGraw, M.M., Jacobi, G.Z., Canavan, C.M., Schrader, T.S., Mercer, D., Hill, R., and Moran, B.C. 2006. Ecoregions of New Mexico (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey.

National Climate Data Center (NCDC), National Oceanic and Atmospheric Administration (NOAA). U.S. Standardized Precipitation Index. http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/spi.html

National Drought Mitigation Center (NDMC). 1995. The Standardized Precipitation Index (SPI). School of Natural Resources, University of Nebraska – Lincoln. www.drought.unl.edu/MonitoringTools/DailyGriddedSPI.aspx

New Mexico Administrative Code (NMAC). 2012. *State of New Mexico Standards for Interstate and Intrastate Surface Waters*. New Mexico Water Quality Control Commission. As amended through April 30, 2012 (20.6.4 NMAC)

New Mexico Environmental Department (NMED), 2011. Statewide Water Quality Management Plan and Continuing Planning Process Appendix C: *Hydrology Protocol for the Determination of Uses Supported By Ephemeral, Intermittent, and Perennial Waters*. May 2011. p. 55 ftp://ftp.nmenv.state.nm.us/www/swqb/WQMP-CPP/WQMP-CPP-December2011.pdf

New Mexico Office of the State Engineer (NMOSE). 2013. New Mexico Water Rights Reporting System (NMWRRS). http://www.ose.state.nm.us/waters_db_index.html

APPENDIX A

UAA Factors

40 CFR 131.10(g):

(g) States may remove a designated use which is not an existing use, as defined in Sec. 131.3, or establish sub-categories of a use if the State can demonstrate that attaining the designated use is not feasible because:

(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or

(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or

(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

(4) Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

(6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

APPENDIX B

Agua Chiquita (Rio Pe¶asco to McEwan Canyon)

Cover Sheet - Hydrology Protocol Use Attainability Analysis for an Ephemeral Stream[1]

Stream Name:	Basin:	8-digit HUC:
Aqua Chiquita	Pecos River, Rio Peñasco watershed	13060010
Reach Description:	**Upstream lat/long:**	**Downstream lat/long:**
Rio Peñasco to McEwan Canyon	32.798 / -105.461	32.914 / -105.338
Current WQS		**Assessment Unit ID:**
☒ Unclassified 20.6.4.98 NMAC ☐ Classified 20.6.4. NMAC		NM2208-01

Reach Evaluation (How homogeneity of reach hydrology was verified)	
Methods Used	NMED staff observations, site photos, aerial photos, topo maps. GIS mapping layers of geology, vegetation and ecoregions.
Reasoning	Agua Chiquita from the Rio Peñasco to its headwaters is approximately 36 miles long. A significant break in geology, vegetation and ecoregion occurs in the vicinity of McEwan Canyon, approximately 10 miles upstream of the confluence with the Rio Peñasco. Characteristics from Rio Peñasco to McEwan Canyon are homogenous. Channel is dry or nearly dry with no riparian corridor.

Hydrology Protocol Results		**Notes**
Location 1 (lat/long): 32.90522/ -105.343702	☒ eph ☐ int ☐ per	Above Rio Penasco =1
Location 2 (lat/long): 32.82943/ -105.44823	☒ eph ☐ int ☐ per	McDonald Flats Road =2
☐ Additional location results attached.		

Hydroclimatic Conditions		**If "yes" please describe.**
Drought (SPI Value < -1.5)	☐ yes ☒ no	
Recent Rainfall (within 48 hours)	☐ yes ☒ no	
Gauge data available?	☐ yes ☒ no	
If yes for any of above, please explain why these conditions do not impact the UAA conclusion that natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use:		

Hydrologic and Other Modifications		**If "yes" please describe.**
Dam/diversion	☒ yes ☐ no	20 NMOSE permitted surface diversions
Channelization/roads	☒ yes ☐ no	HP was conducted at a rural road crossing.
Groundwater pumping	☒ yes ☐ no	31 NMOSE permitted wells
Agricultural return flows	☐ yes ☒ no	
Existing point source discharge	☐ yes ☒ no	
Planned point source discharge	☐ yes ☒ no	

[1] This form is designed for the UAA process for ephemeral waters described in Subsection C of 20.6.4.15 NMAC.

Hydrologic and Other Modifications		If "yes" please describe.
Other modifications e.g., land use practices	☐ yes ☒ no	
If yes for any of above, please explain why these modifications do not alter the uses supported by the natural flow regime: Stream above and below road crossing have the same characteristics. NMOSE documents 31 wells and 20 surface diversions within 1 mile of the evaluated reach. Total of all well diversions is 152 acre-feet per year (afy). Minimum depth to water is 105 feet, indicating that groundwater pumping is not affecting surface flow. Total of all surface diversions is 763 afy, mostly declarations >100 years old. NMOSE documents the evaluated reach as ephemeral, therefore it is not possible for these water rights to be fully utilized. Based on the very low HP scores and depth to groundwater, it is unlikely that intermittent or perennial flows have existed historically.		

Current Uses Observed		If "yes" please describe.
Macroinvertebrates	☐ yes ☒ no	
Fish	☐ yes ☒ no	
Recreation (contact use)	☐ yes ☒ no	
If yes for any of the above, please explain why these observed uses are consistent with the UAA conclusion that 101(a)(2) aquatic life and recreational uses are not feasible:		

Additional Comments:

ATTACHMENTS:

☒ Map and Photos (required)
☒ Hydrology Protocol Field Sheets for all locations (required)
☐ Level 2 Analysis (optional)
☒ Additional sites and/or documentation (optional) SPI

CONCLUSION:

This UAA concludes that the stream reach identified above is ephemeral and that Clean Water Act Section 101(a)(2) aquatic life and recreational uses are neither existing nor attainable due to the factor identified in 40 CFR 131.10(g)(2): *natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent*. Based on this conclusion, we recommend that the designated uses and criteria identified in 20.6.4.97 NMAC be applied to this stream reach in accordance with the UAA process set forth in Subsection C of 20.6.4.15 NMAC.

Submitted by: Deborah Sarabia, NMED

Signed: _____ Date: _____

Surface Water Quality Bureau concurs with recommendation. ☐ Yes ☐ No

If no, see attached reasons.

Signed: _____ Date: _____

EPA Region 6 technical approval granted. ☐ Yes ☐ No

If no, see attached reasons.

Signed: _____ Date: _____

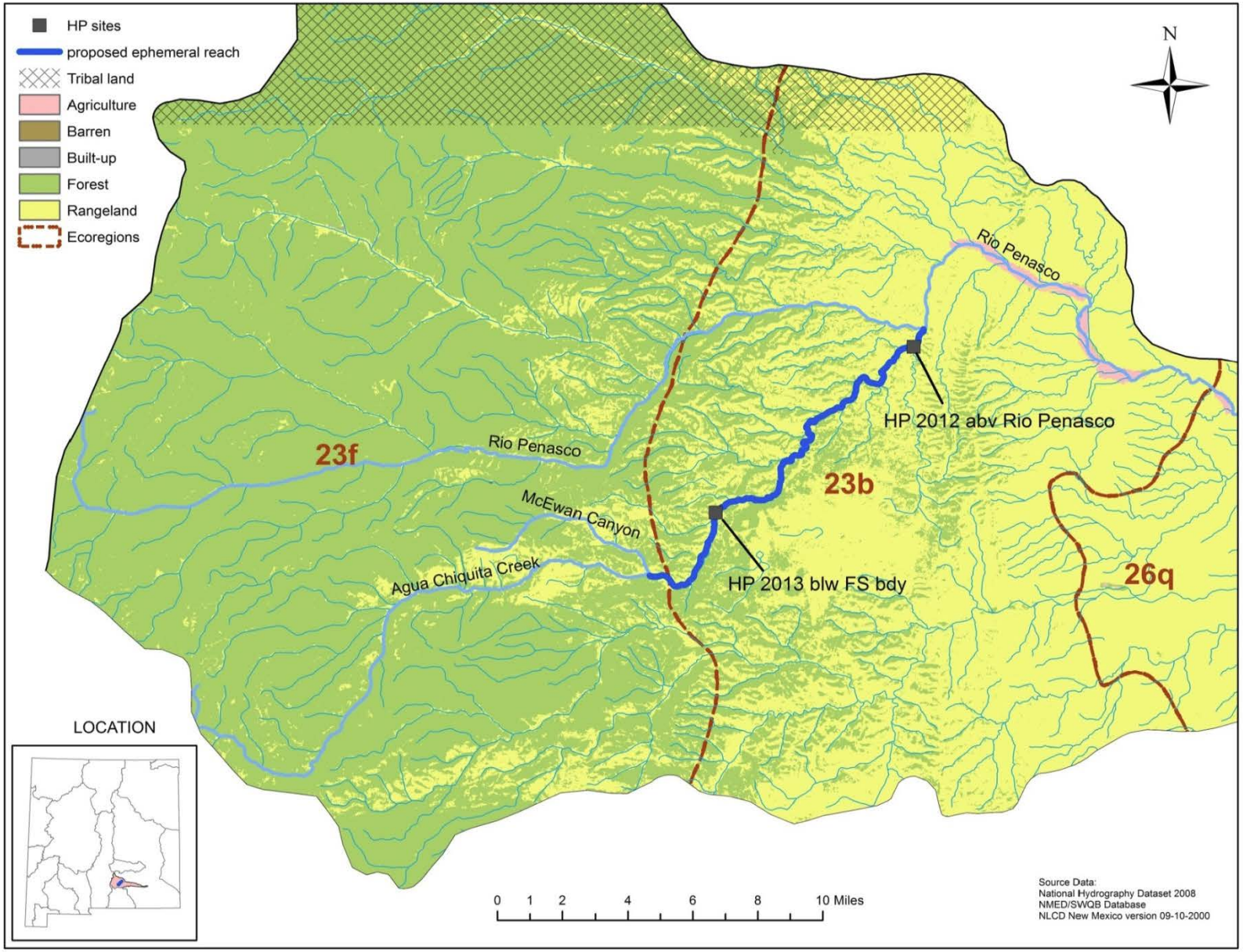


Figure B-1. Agua Chiquita Ecoregions and Land Use/Land Cover

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 5-8-13	**Stream Name:** Agua Chiq.	**Latitude:** 32.82943
Evaluator(s): DS, SM	**Site ID:** Q Miller + McDon.	**Longitude:** 105.44823
TOTAL POINTS: 2 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM-2208-01	**Drought Index (12-mo. SPI Value):** -1 – -1.5

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 20 %cloud cover ___ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 10 %cloud cover ___ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES X NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ___ YES X NO **Diversions** X YES ___ NO **Discharges** ___ YES X NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	2

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.9)	
If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL. If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL. YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.				
1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.	
	3	1.5	0	
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
			TOTAL POINTS (#1.1 – #1.12)	

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
	TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)	

Agua Chiquita

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Photo Descriptions and NOTES

Photo #	Description (US, DS, LB, RB, etc.)	Notes
1581-82	2012 sonde location	
1583-85	2013 HP	

NOTES:

traveling from Weed: NM24 east ~3 mi
along AC, left on Miller Flats Rd, ~3 mi, rt on
McDonald Flats Rd, HP from bridge
Irrig likely, some sm impoundments

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 9/26/12	**Stream Name:** Agua Chiquita	**Latitude:** 32.90522
Evaluator(s): Doug & Huey	**Site ID:** A.C. above Peñasco	**Longitude:** -105.343702
TOTAL POINTS: 1 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM 2208-01	**Drought Index (12-mo. SPI Value):** 0 to -1

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover ✓ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover ✓ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES ✓ NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ✓ YES ___ NO **Diversions** ✓ YES ___ NO **Discharges** ___ YES ✓ NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	1

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with no bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.9)	
If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL. If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL. YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.				
1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.	
	3	1.5	0	
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
			TOTAL POINTS (#1.1 – #1.12)	

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
		TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Photo Descriptions and NOTES

Photo #	Description (US, DS, LB, RB, etc.)	Notes

NOTES:

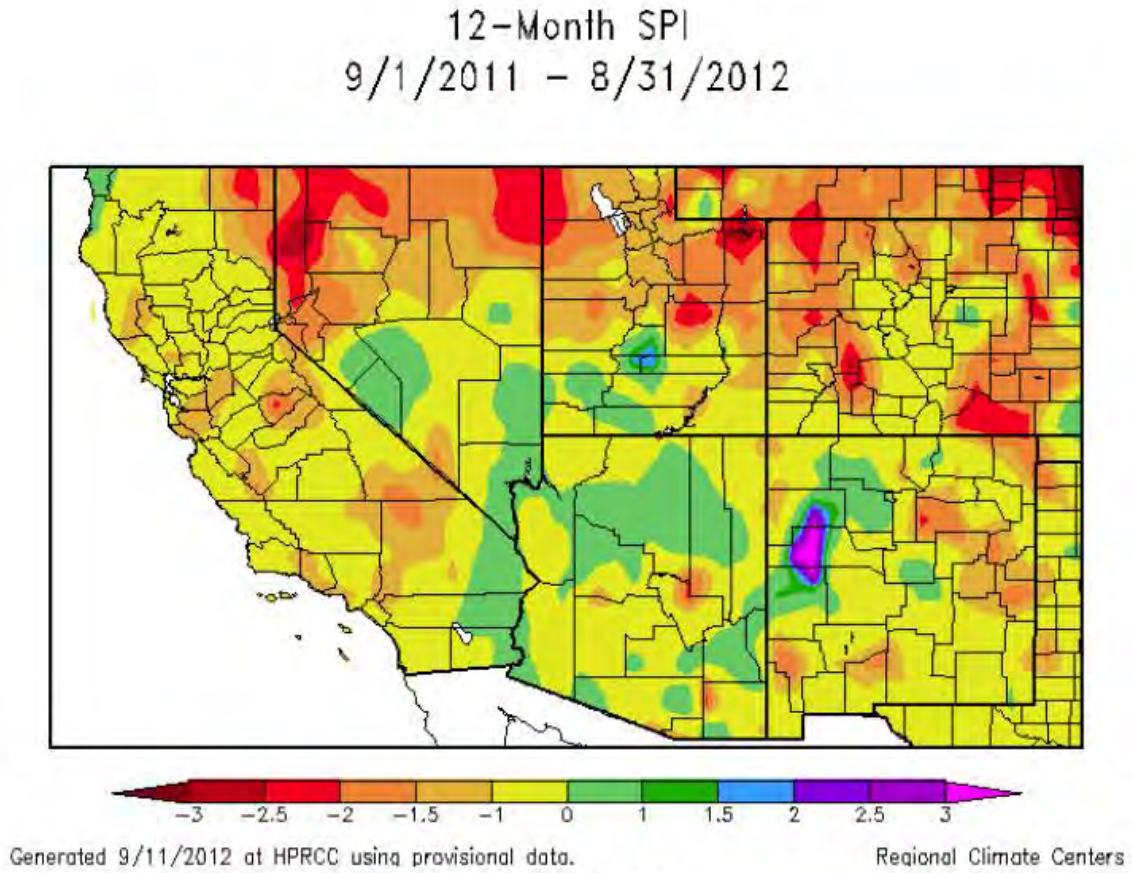
Suspected irrigation diversions below Weed.

Not observed.

Channel was witnessed as ephemeral throughout the Season.

Figure B-2. Hydrology protocol site, Agua Chiquita above Rio Pe¶asco

Figure B-3. Hydrology protocol site, Agua Chiquita at McDonald Flats Road, view downstream



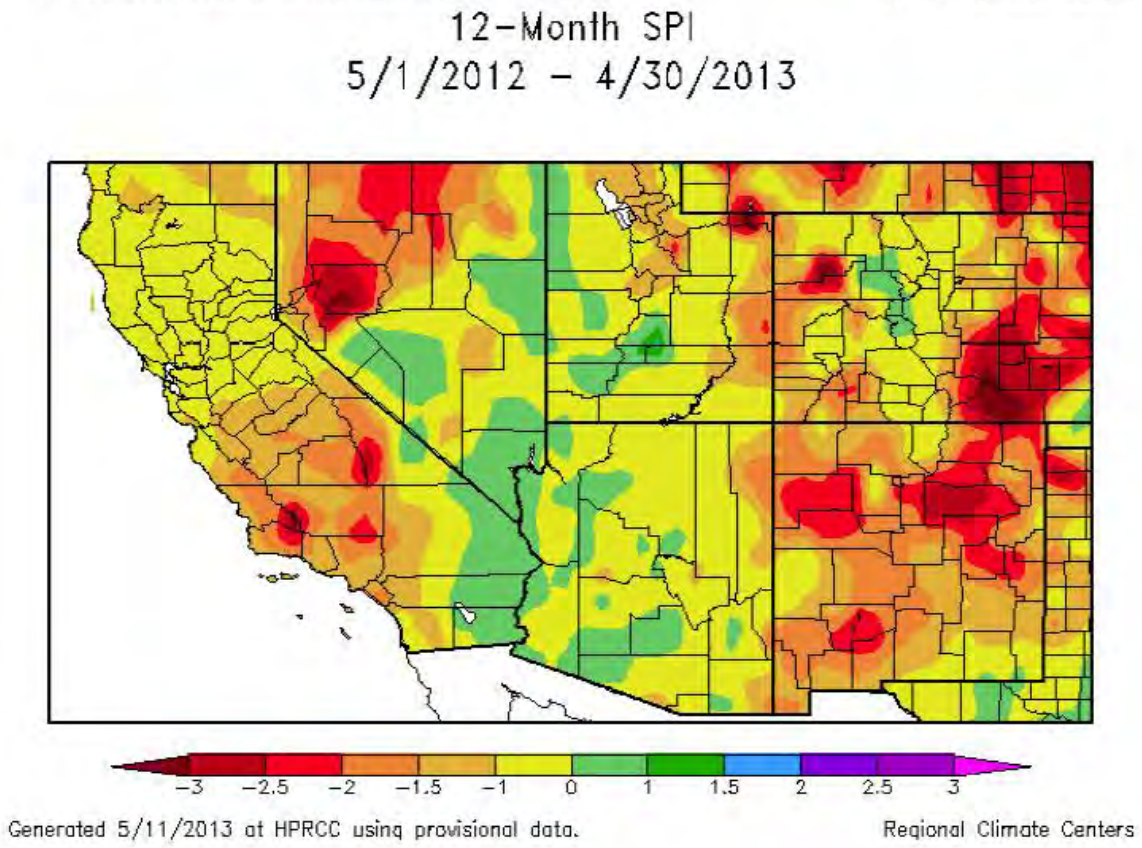


Figure B-4. 12 month-SPI

APPENDIX C

Grindstone Canyon (Grindstone Reservoir to headwaters)

Cover Sheet - Hydrology Protocol Use Attainability Analysis for an Ephemeral Stream[2]

Stream Name:	Basin:	8-digit HUC:
Grindstone Canyon	Pecos River, Rio Hondo watershed	13060008
Reach Description:	**Upstream lat/long:**	**Downstream lat/long:**
Grindstone Reservoir to headwaters	33.322 / -105.694	33.32144 / -105.68969
Current WQS		**Assessment Unit ID:**
☒ Unclassified 20.6.4.98 NMAC ☐ Classified 20.6.4. NMAC		NM98.A-009

Reach Evaluation (How homogeneity of reach hydrology was verified)	
Methods Used:	NMED staff observations, site photos, aerial photos, topo maps. GIS mapping layers of geology, vegetation and ecoregions.
Reasoning:	Grindstone Canyon above the reservoir is 1.1 miles and there is no variation in reach characteristics. Aerial photos show a dry channel and no riparian corridor.

Hydrology Protocol Results		Notes
Location 1 (lat/long): 33.32144/ -105.68969	☒ eph ☐ int ☐ per	Above reservoir =1
Location 2 (lat/long): N/A	☐ eph ☐ int ☐ per	Not needed for this short homogenous reach
☐ Additional location results attached.		

Hydroclimatic Conditions		If "yes" please describe.
Drought (SPI Value < -1.5)	☐ yes ☒ no	
Recent Rainfall (within 48 hours)	☐ yes ☒ no	
Gauge data available?	☐ yes ☒ no	
If yes for any of above, please explain why these conditions do not impact the UAA conclusion that natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use:		

Hydrologic and Other Modifications		If "yes" please describe.
Dam/diversion	☒ yes ☐ no	Dam and 2 NMOSE permitted diversions downstream of dam.
Channelization/roads	☐ yes ☒ no	
Groundwater pumping	☒ yes ☐ no	1 NMOSE permitted well
Agricultural return flows	☐ yes ☒ no	
Existing point source discharge	☐ yes ☒ no	
Planned point source discharge	☐ yes ☒ no	
Other modifications e.g., land use practices	☐ yes ☒ no	

[2] This form is designed for the UAA process for ephemeral waters described in Subsection C of 20.6.4.15 NMAC.

Hydrologic and Other Modifications		If "yes" please describe.
If yes for any of above, please explain why these modifications do not alter the uses supported by the natural flow regime: Water for the reservoir is pumped from Rio Ruidoso, not Grindstone Canyon. NMOSE documents 1 well and 2 surface diversions within 1/2 mile of evaluated reach. Dam is below the evaluated reach. The total diversion is 3 afy, not significant enough to affect surface hydrology.		
Current Uses Observed		**If "yes" please describe.**
Macroinvertebrates	☐ yes ☒ no	
Fish	☐ yes ☒ no	
Recreation (contact use)	☐ yes ☒ no	
If yes for any of the above, please explain why these observed uses are consistent with the UAA conclusion that 101(a)(2) aquatic life and recreational uses are not feasible:		

Additional Comments:

ATTACHMENTS:

☒ Map and Photos (required)
☒ Hydrology Protocol Field Sheets for all locations (required)
☐ Level 2 Analysis (optional)
☒ Additional sites and/or documentation (optional) SPI

CONCLUSION:

This UAA concludes that the stream reach identified above is ephemeral and that Clean Water Act Section 101(a)(2) aquatic life and recreational uses are neither existing nor attainable due to the factor identified in 40 CFR 131.10(g)(2): *natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent*. Based on this conclusion, we recommend that the designated uses and criteria identified in 20.6.4.97 NMAC be applied to this stream reach in accordance with the UAA process set forth in Subsection C of 20.6.4.15 NMAC.

Submitted by: Deborah Sarabia, NMED

Signed: _____ Date: _____

Surface Water Quality Bureau concurs with recommendation. ☐ Yes ☐ No

If no, see attached reasons.

Signed: _____ Date: _____

EPA Region 6 technical approval granted. ☐ Yes ☐ No

If no, see attached reasons.

Signed: _____ Date: _____

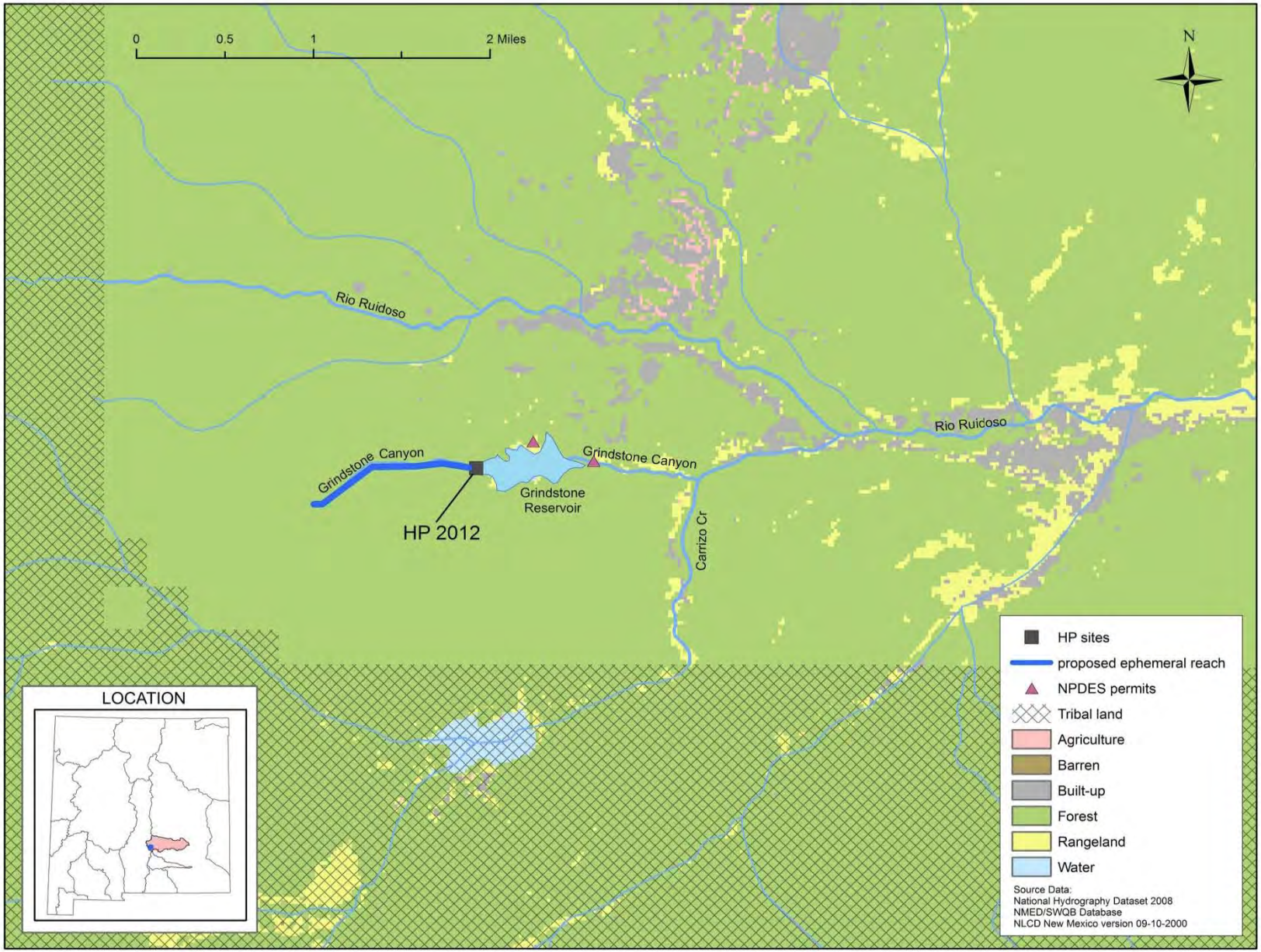


Figure C-1. Grindstone Canyon Land Use/Land Cover

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 7/19/12	**Stream Name:** Grindstone Cr	**Latitude:** 33.32144
Evaluator(s): Dog, Greg	**Site ID:** Grindstone Cr abv Res	**Longitude:** -105.68969
TOTAL POINTS: 1 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM 98A009 Grindstone Creek/(Grindstone Res to above)	**Drought Index (12-mo. SPI Value):** 0 to -1

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover ✓ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover ✓ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES ✓ NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ___ YES ✓ NO **Diversions** ___ YES ✓ NO **Discharges** ___ YES ✓ NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	1

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with no bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
				SUBTOTAL (#1.1 – #1.9)

If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.

1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.
	3	1.5	0

1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
				TOTAL POINTS (#1.1 – #1.12)

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
		TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)

Figure C-2. Hydrology protocol site, Grindstone Canyon above reservoir

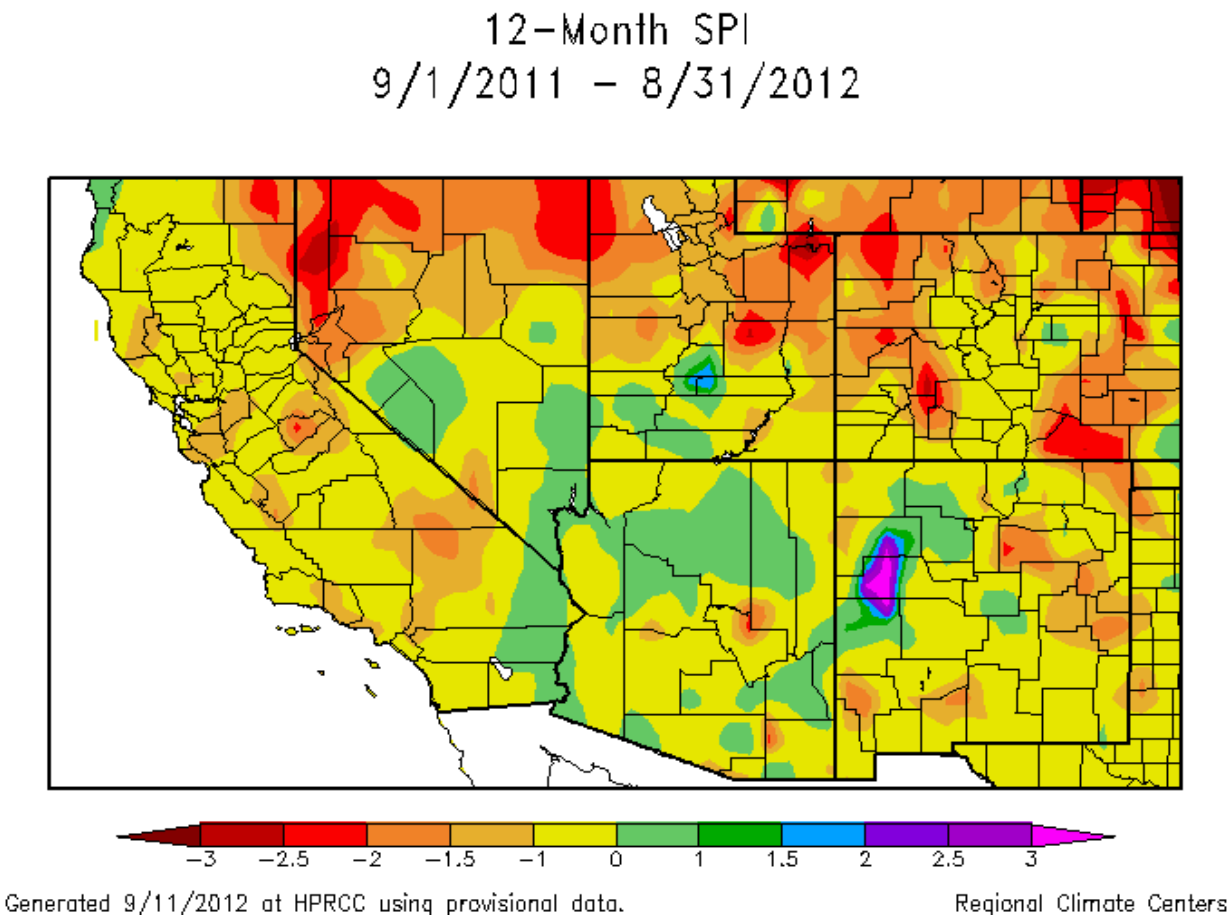


Figure C-3. 12-month SPI.

APPENDIX D

San Andres Canyon (Taylor Ranch Road to South San Andres Canyon)

Cover Sheet - Hydrology Protocol Use Attainability Analysis for an Ephemeral Stream[3]

Stream Name:	**Basin:**	**8-digit HUC:**
San Andres Canyon	Tularosa Closed	13050003
Reach Description:	**Upstream lat/long:**	**Downstream lat/long:**
Taylor Ranch Road to South San Andres Canyon	32.784 / -105.889	32.768 / -105.945
Current WQS		**Assessment Unit ID:**
☒ Unclassified 20.6.4.98 NMAC ☐ Classified 20.6.4. NMAC		NM-2801-30

Reach Evaluation (How homogeneity of reach hydrology was verified)	
Methods Used:	NMED staff observations, site photos, aerial photos, topo maps. GIS mapping layers of geology, vegetation and ecoregions.
Reasoning:	San Andres Canyon is ten miles long through a highly varied landscape spanning four different ecoregions. Elevation ranges from 4100 to 9000 feet. An ecoregional and topographic change occur at South San Andres Canyon where an escarpment runs north to south. Characteristics are homogenous from South San Andres Canyon downstream to Taylor Ranch Road, a distance of approximately four miles. Aerial photos show a dry channel with some additional vegetation occurring at two springs.

Hydrology Protocol Results		**Notes**
Location 1 (lat/long): 32.781784 / -105.920766	☒ eph ☐ int ☐ per	Mouth of canyon =2
Location 2 (lat/long): 32.78162/ -105.90791	☒ eph ☐ int ☐ per	Below Hackberry Spring =3.5
☐ Additional location results attached.		

Hydroclimatic Conditions		**If "yes" please describe.**
Drought (SPI Value < -1.5)	☐ yes ☒ no	
Recent Rainfall (within 48 hours)	☐ yes ☒ no	
Gauge data available?	☐ yes ☒ no	
If yes for any of above, please explain why these conditions do not impact the UAA conclusion that natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use:		

Hydrologic and Other Modifications		**If "yes" please describe.**
Dam/diversion	☒ yes ☐ no	2 NMOSE permitted surface diversions
Channelization/roads	☐ yes ☒ no	
Groundwater pumping	☒ yes ☐ no	12 NMOSE permitted wells
Agricultural return flows	☐ yes ☒ no	
Existing point source discharge	☐ yes ☒ no	
Planned point source discharge	☐ yes ☒ no	

[3] This form is designed for the UAA process for ephemeral waters described in Subsection C of 20.6.4.15 NMAC.

Hydrologic and Other Modifications		If "yes" please describe.
Other modifications e.g., land use practices	☐ yes ☒ no	
If yes for any of above, please explain why these modifications do not alter the uses supported by the natural flow regime: NMOSE documents 12 wells and 1 surface diversion within 1 mile of evaluated reach. Total of well diversions are 5912 afy, all of which is from wells located downstream of the canyon. Minimum depth to water is 170 feet. Based on well location and depth to water, groundwater pumping is not affecting surface flow in the canyon. Two surface declarations were noted; one is inactive or abandoned, and one diverts water from Morgan Spring in the lower canyon. Based on the very low HP scores, depth to groundwater, the presence of only two surface water right declarations (only one is currently active), and the arid landscape, it is unlikely that intermittent or perennial flows have existed historically.		
Current Uses Observed		**If "yes" please describe.**
Macroinvertebrates	☐ yes ☒ no	
Fish	☐ yes ☒ no	
Recreation (contact use)	☐ yes ☒ no	
Additional Comments:		

ATTACHMENTS:

☒ Map and Photos (required)
☒ Hydrology Protocol Field Sheets for all locations (required)
☐ Level 2 Analysis (optional)
☒ Additional sites and/or documentation (optional) SPI

CONCLUSION:
This UAA concludes that the stream reach identified above is ephemeral and that Clean Water Act Section 101(a)(2) aquatic life and recreational uses are neither existing nor attainable due to the factor identified in 40 CFR 131.10(g)(2): *natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent*. Based on this conclusion, we recommend that the designated uses and criteria identified in 20.6.4.97 NMAC be applied to this stream reach in accordance with the UAA process set forth in Subsection C of 20.6.4.15 NMAC.

Submitted by: Deborah Sarabia, NMED

Signed: _____ Date: _____

Surface Water Quality Bureau concurs with recommendation. ☐ Yes ☐ No

If no, see attached reasons.

Signed: _____ Date: _____

EPA Region 6 technical approval granted. ☐ Yes ☐ No

If no, see attached reasons.

Signed: _____ Date: _____

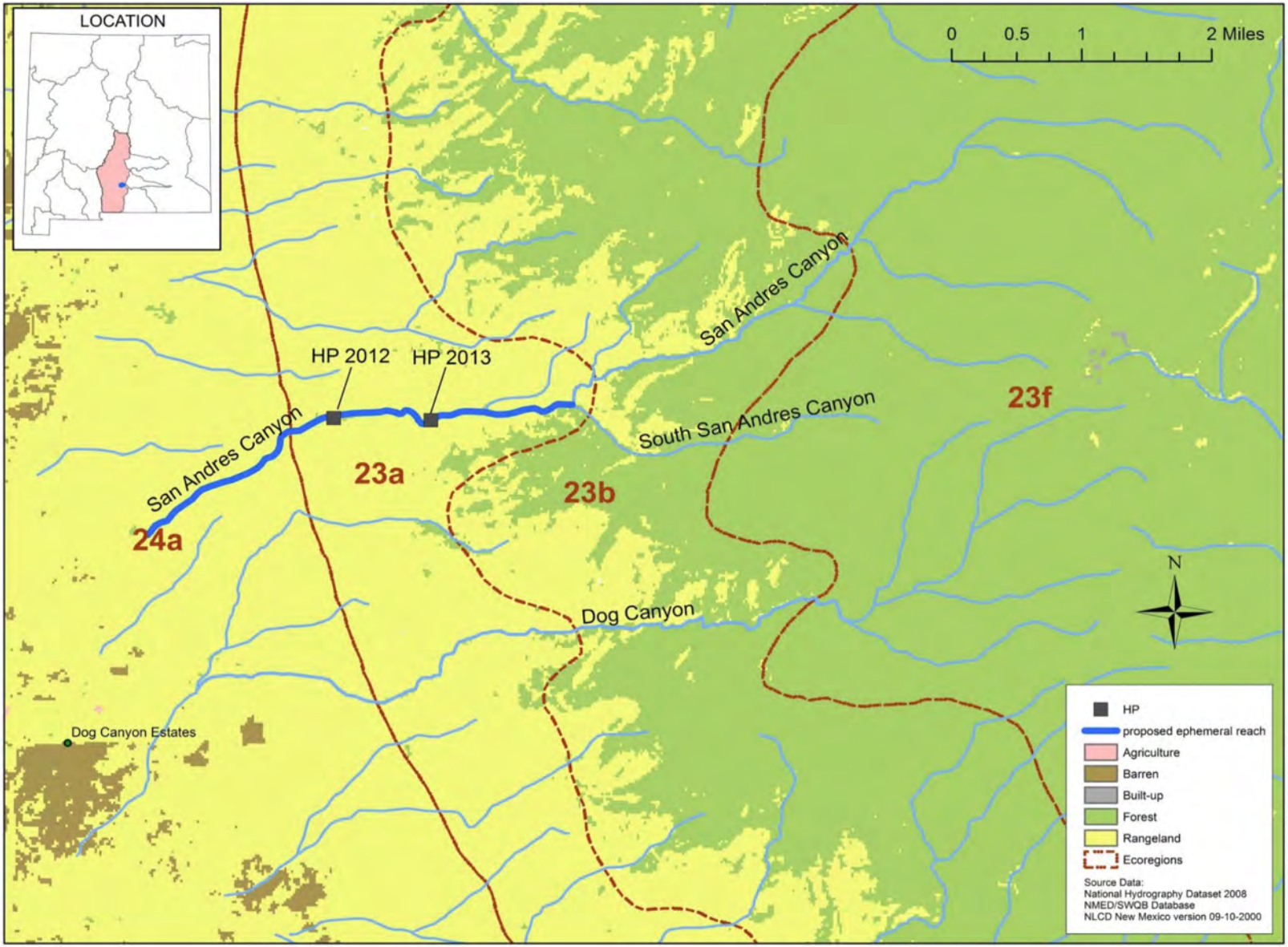


Figure D-1. San Andres Canyon Ecoregions and Land Use/Land Cover

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 4/17/2012	**Stream Name:** San Andreas	**Latitude:** 32.781784
Evaluator(s): Abey Canavan	**Site ID:** Taylor Ranch Rd	**Longitude:** -105.920766
TOTAL POINTS: 2 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM 2801-30	**Drought Index (12-mo. SPI Value):** -1 to -1.5

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover ✓ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover ✓ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES ✓ NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ___ YES ___ NO **Diversions** ✓ YES ___ NO **Discharges** ___ YES ___ NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	2

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with no bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.9)	
If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL. If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL. YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.				
1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.	
	3	1.5	0	
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
			TOTAL POINTS (#1.1 – #1.12)	

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
		TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)

Lower Channel Ephemeral throught the Season.
Pipe Line Present in Channel possibly transporting water
from upper spring to ?

Tular

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 5-7-13	**Stream Name:** San Andres	**Latitude:** 32.78162
Evaluator(s): DS, SM	**Site ID:** b/w Hackberry Sp	**Longitude:** -105.90791
TOTAL POINTS: 3.5 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM 2801-30	**Drought Index (12-mo. SPI Value):** -1 - -1.5

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 10 %cloud cover ___ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover X clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES X NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ___ YES X NO **Diversions** X YES ___ NO **Discharges** ___ YES X NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2 1.5	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg.	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	2.5

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with [illegible] bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.9)	3.5
If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL. If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL. YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.				
1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.	
	3	1.5	0	
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
			TOTAL POINTS (#1.1 – #1.12)	

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
	TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)	

San Andres

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Photo Descriptions and NOTES

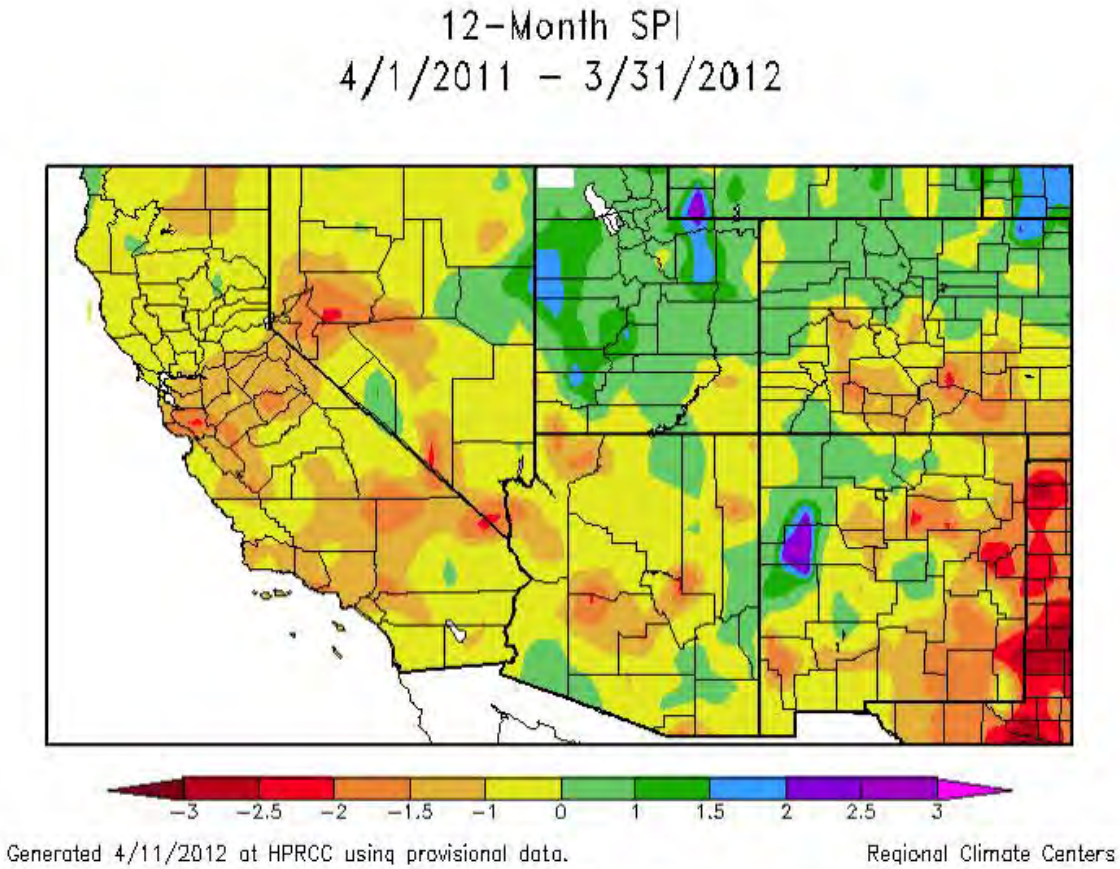
Photo #	Description (US, DS, LB, RB, etc.)	Notes
1491		
-1523		

NOTES:

6" pipe is transporting water from? to?
Goes underground approx ¼ mi up canyon.
Pipe looks new and water heard flowing thru inside.
Riparian includes tamarisk, willow, cottonwood hackberry (?) - all sparse.
Springs indicated on topo but not observed.
Cny rocky + difficult to walk - did not make it to SSA confluence

Figure D-2. Hydrology protocol site, mouth of San Andres Canyon above Taylor Ranch.

Figure D-3. Hydrology protocol site, San Andres Canyon below Hackberry Spring



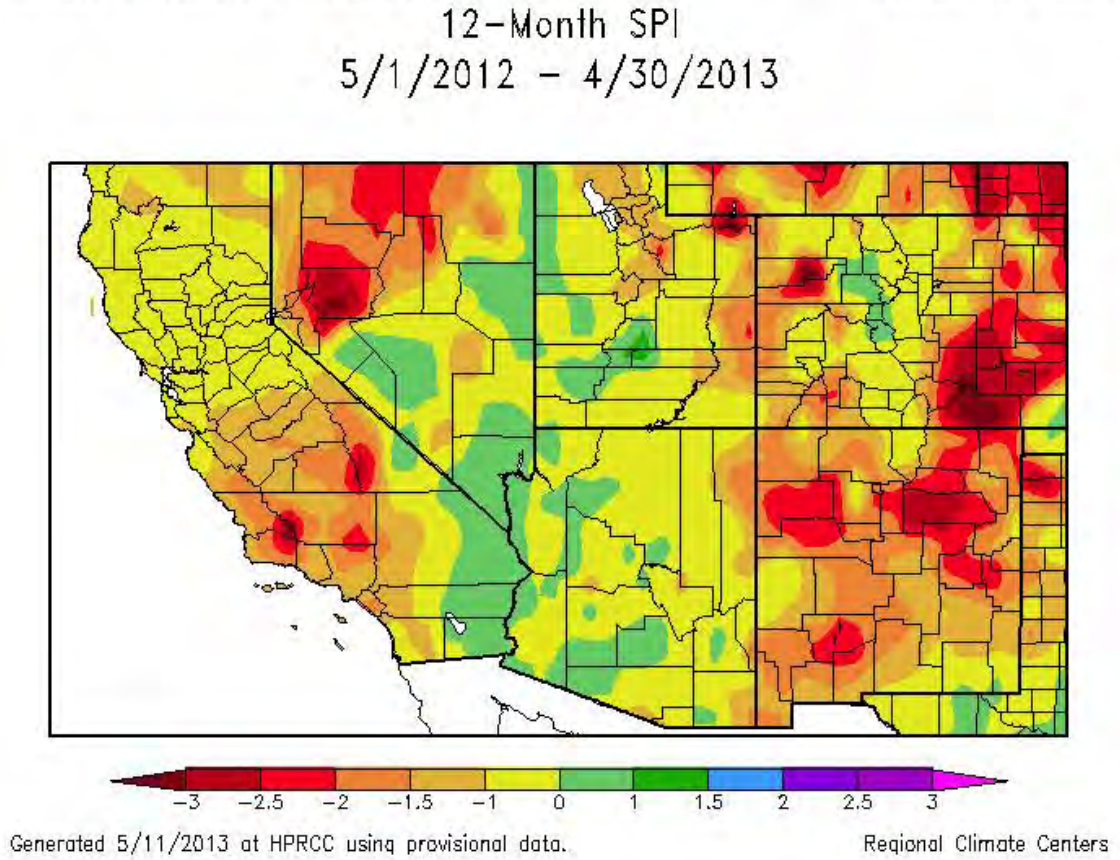


Figure D-4. 12-month SPI.

APPENDIX E.

San Vicente Arroyo (Mimbres River to Maudes Canyon)

Cover Sheet - Hydrology Protocol Use Attainability Analysis for an Ephemeral Stream[4]

Stream Name:	Basin:	8-digit HUC:
San Vicente Arroyo	Mimbres Closed	13030202
Reach Description:	**Upstream lat/long:**	**Downstream lat/long:**
Mimbres River to Maudes Canyon	32.714 / -108.244	32.401 / -107.966
Current WQS		**Assessment Unit ID:**
☒ Unclassified 20.6.4.98 NMAC ☐ Classified 20.6.4. NMAC		NM9000.A-026

Reach Evaluation (How homogeneity of reach hydrology was verified)	
Methods Used:	Staff observations, photos, topo maps. GIS mapping layers of geology, soil, vegetation, ecoregions.
Reasoning:	San Vicente Arroyo is approximately 32 miles from the Mimbres River to Maudes Canyon. Characteristics are homogenous below Maudes Canyon. Aerial photos show a dry channel throughout the reach and no riparian corridor.

Hydrology Protocol Results		**Notes**
Location 1 (lat/long): 32.64330/ -108.21333	☒ eph ☐ int ☐ per	Tyrone Road =2
Location 2 (lat/long): 32.65803/ -108.21835	☒ eph ☐ int ☐ per	Ridge Road =2
☐ Additional location results attached.		

Hydroclimatic Conditions		**If "yes" please describe.**
Drought (SPI Value < -1.5)	☒ yes ☐ no	-1.5 (NCDC/NOAA) and < -1.5 (NDMC)
Recent Rainfall (within 48 hours)	☐ yes ☒ no	
Gauge data available?	☐ yes ☒ no	

If yes for any of above, please explain why these conditions do not impact the UAA conclusion that natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use: The 12-month SPI was less than -1.5 according to the NDMC index and = -1.5 using the NOAA/NCDC index. Although both of these indices indicate considerable drought conditions, they do not alter the Department's determination as ephemeral. Over the past 10 years, the NDMC 12-mo SPI was less than -1.5 for only two of those years. Based on the very low HP scores, the absence of NMOSE surface water right declarations, and current (see Figures E-2, E-3) and historical (see Figure E-4) landscape characteristics, it is unlikely that intermittent or perennial flows can be sustained even under normal precipitation conditions.

Hydrologic and Other Modifications		**If "yes" please describe.**
Dam/diversion	☐ yes ☒ no	
Channelization/roads	☒ yes ☐ no	Each HP was conducted at a rural road crossing.
Groundwater pumping	☒ yes ☐ no	73 NMOSE permitted wells
Agricultural return flows	☐ yes ☒ no	
Existing point source discharge	☒ yes ☐ no	Silver City WWTP

[4] This form is designed for the UAA process for ephemeral waters described in Subsection C of 20.6.4.15 NMAC.

Hydrologic and Other Modifications		If "yes" please describe.
Planned point source discharge	☐ yes ☒ no	
Other modifications e.g., land use practices	☐ yes ☒ no	

If yes for any of above, please explain why these modifications do not alter the uses supported by the natural flow regime: Arroyo above and below road crossings have the same characteristics. NMOSE documents 73 wells and 0 surface diversions within 1 mile of evaluated reach. Total diversions are 1658 afy, nearly all of which (1500 afy) is from wells with a depth-to-water >100 feet, most of which are located below the canyon and have no record of pumping. Based on well location and depth to water, groundwater pumping is not affecting surface flow. Based on the very low HP scores, the absence of NMOSE surface water right declarations, and current (see Figures E-2, E-3) and historical (see Figure E-4) landscape characteristics, it is unlikely that intermittent or perennial flows have existed historically.

Current Uses Observed		If "yes" please describe.
Macroinvertebrates	☐ yes ☒ no	
Fish	☐ yes ☒ no	
Recreation (contact use)	☐ yes ☒ no	

If yes for any of the above, please explain why these observed uses are consistent with the UAA conclusion that 101(a)(2) aquatic life and recreational uses are not feasible:

Additional Comments:

The Silver City WWTP effluent discharge creates a 0.2 mile intermittent reach above the evaluated ephemeral reach. The effluent flow ends at the confluence with Maudes Canyon.

ATTACHMENTS:

☒ Map and Photos (required)
☒ Hydrology Protocol Field Sheets for all locations (required)
☐ Level 2 Analysis (optional)
☒ Additional sites and/or documentation (optional) SPI

CONCLUSION:

This UAA concludes that the stream reach identified above is ephemeral and that Clean Water Act Section 101(a)(2) aquatic life and recreational uses are neither existing nor attainable due to the factor identified in 40 CFR 131.10(g)(2): *natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent*. Based on this conclusion, we recommend that the designated uses and criteria identified in 20.6.4.97 NMAC be applied to this stream reach in accordance with the UAA process set forth in Subsection C of 20.6.4.15 NMAC.

Submitted by: Deborah Sarabia, NMED

Signed: _____ Date: _____

Surface Water Quality Bureau concurs with recommendation. ☐ Yes ☐ No

If no, see attached reasons.

Signed: _____ Date: _____

EPA Region 6 technical approval granted. ☐ Yes ☐ No

If no, see attached reasons.

Signed: _____ Date: _____

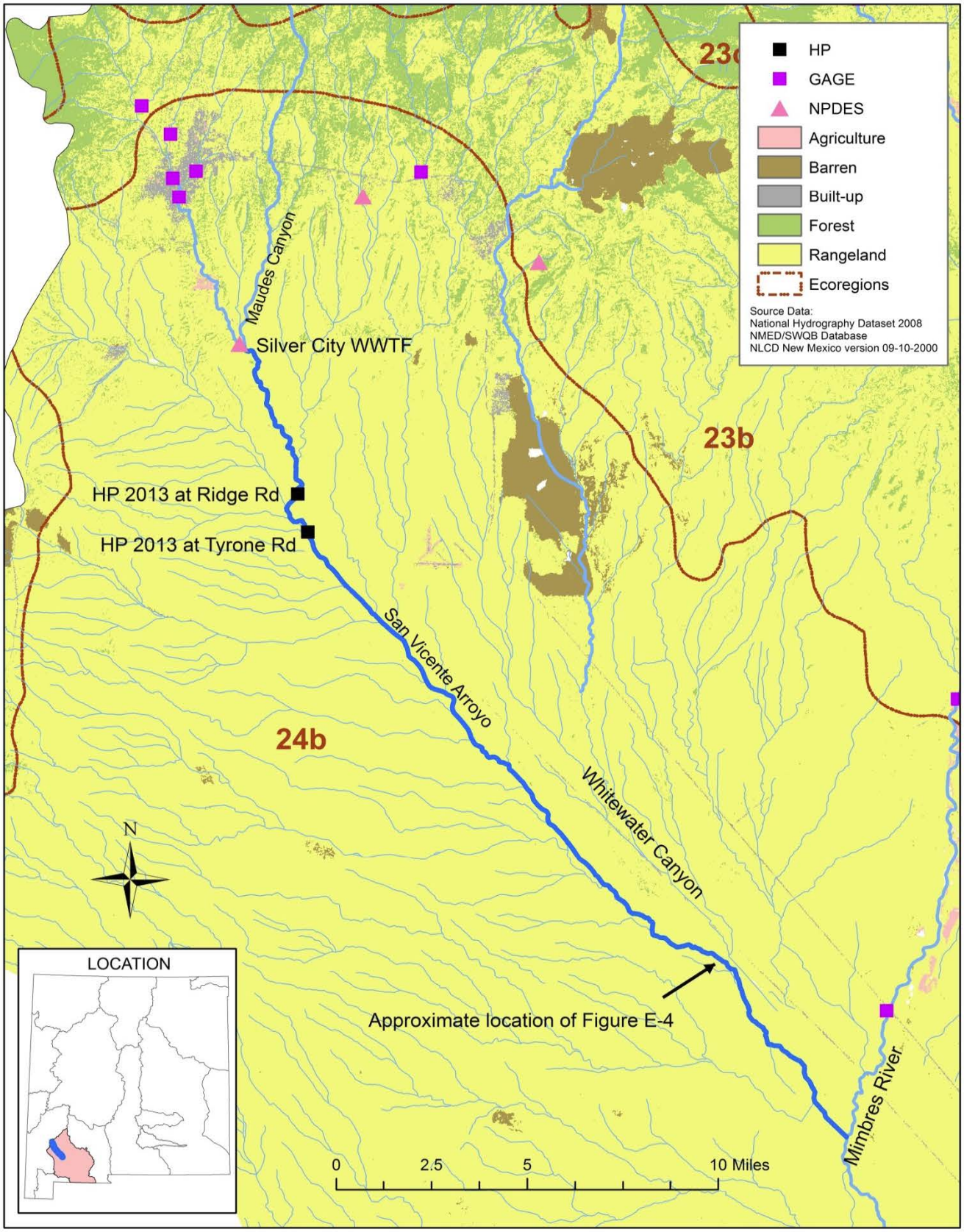


Figure E-1. San Vicente Arroyo and Land Use/Land Cover

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Elevation: 5415 ft.

Date: 02/08/2013	Stream Name: San Vicente Arroyo	Latitude: N32.65803
Evaluator(s): D. Menzie / M. Schultz	Site ID: SVA @ Ridge Rd.	Longitude: W108.21835
TOTAL POINTS: *Stream is at least intermittent if ≥ 12*	Assessment Unit:	Drought Index (12-mo. SPI Value): 1.5

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 30 %cloud cover ___ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 10 %cloud cover ___ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES ✓ NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ___ YES ✓ NO **Diversions** ___ YES ✓ NO **Discharges** ___ YES ✓ NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	2

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Photo Descriptions and NOTES

Photo #	Description (US, DS, LB, RB, etc.)	Notes
SVA at Ridge Rd 1	GOOGLE EARTH IMAGE	Aerial Image of Site
SVA at Ridge Rd 2	Looking a little east of north at SVA/Ridge Rd LOW WATER CROSSING	
SVA at Ridge Rd 3	Looking US at SVA from Ridge Road	Large trees are Desert Willow not typical or true riparian willows
SVA at Ridge Rd 4	looking a little south of east at old bridge	
SVA at Ridge Rd 5	Looking DS at SVA from Ridge Rd.	

NOTES:

1.5 Differences in Vegetation : Very slight compositional difference between uplands and channel involve the rare cottonwood/elm/tree of heaven in channel (not upland) Giant Sacaton ~~on~~ uplands and channel but the upland is dominated by the Sacaton while the channel is ~~fairly~~ clearly lacking much vegetation

1.6 Absence of Rooted upland plants – the sacaton is rooted in areas of the channel and although some what of a floodplain plant it clearly is upland for the swales and old floodplain above the incised channel.

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Elevation. 5353 ft.

Date: 02/08/2013	Stream Name: San Vicente Arroyo	Latitude: N 32.64330
Evaluator(s): D. Menzie / M. Schultz	Site ID: SVA @ Tyrone Rd.	Longitude: W 108.21333
TOTAL POINTS: *Stream is at least intermittent if ≥ 12*	Assessment Unit:	Drought Index (12-mo. SPI Value): 1.5

	NOW:	PAST 48 HOURS:	
WEATHER CONDITIONS	___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 30 %cloud cover ___ clear/sunny	___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 10 %cloud cover ___ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES ✓ NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ___ YES ✓ NO **Diversions** ___ YES ✓ NO **Discharges** ___ YES ✓ NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	2

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Photo Descriptions and NOTES

Photo #	Description (US, DS, LB, RB, etc.)	Notes
SVA at TYRONE Rd 1	GOOGLE EARTH IMAGE	Aerial Image of Site
SVA at Tyrone Rd 2	Looking NW at TYRONE Rd Bridge	
SVA at Tyrone Rd 3	Looking a little west of North US view of SVA	Lone cottonwood upstream and an elm(?) show rare riparian tree in this reach.
SVA at Tyrone Rd 4	Looking a little east of South DS view of SVA	Small patch of Tree of Heaven in lower right and lone elm(?) mid photo RB
SVA at Tyrone Rd 5	Upstream right bank revetment at bridge	Note sulfide bearing waste rock as fill

NOTES:

1.5 Compositional differences between channel and uplands very slight

1.6 Upland Sacaton is rooted in channel along the cut bank

Figure E-2. Hydrology protocol site, San Vicente Arroyo at Ridge Road

Figure E-3. Hydrology protocol site, San Vicente Arroyo at Tyrone Road

Figure E-4. San Vicente Arroyo near confluence with Whitewater Canyon, USGS, 1911

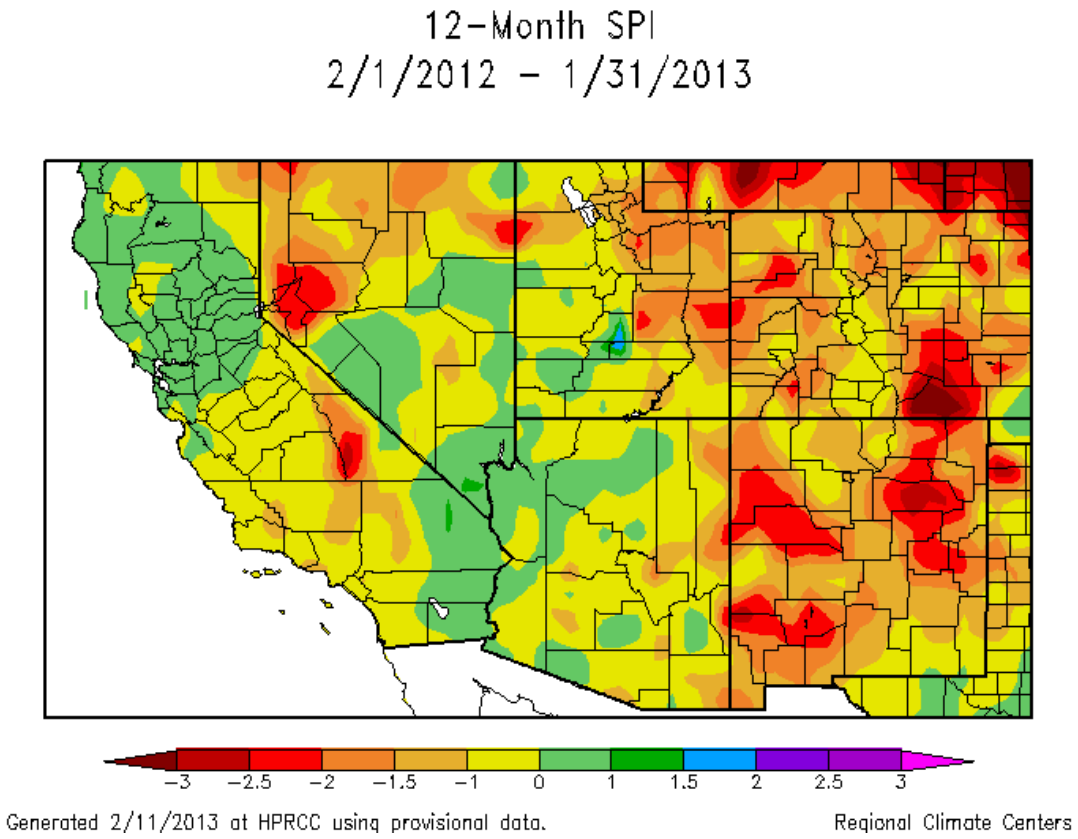


Figure E-5. 12-month SPI: NDMC (2012-13)

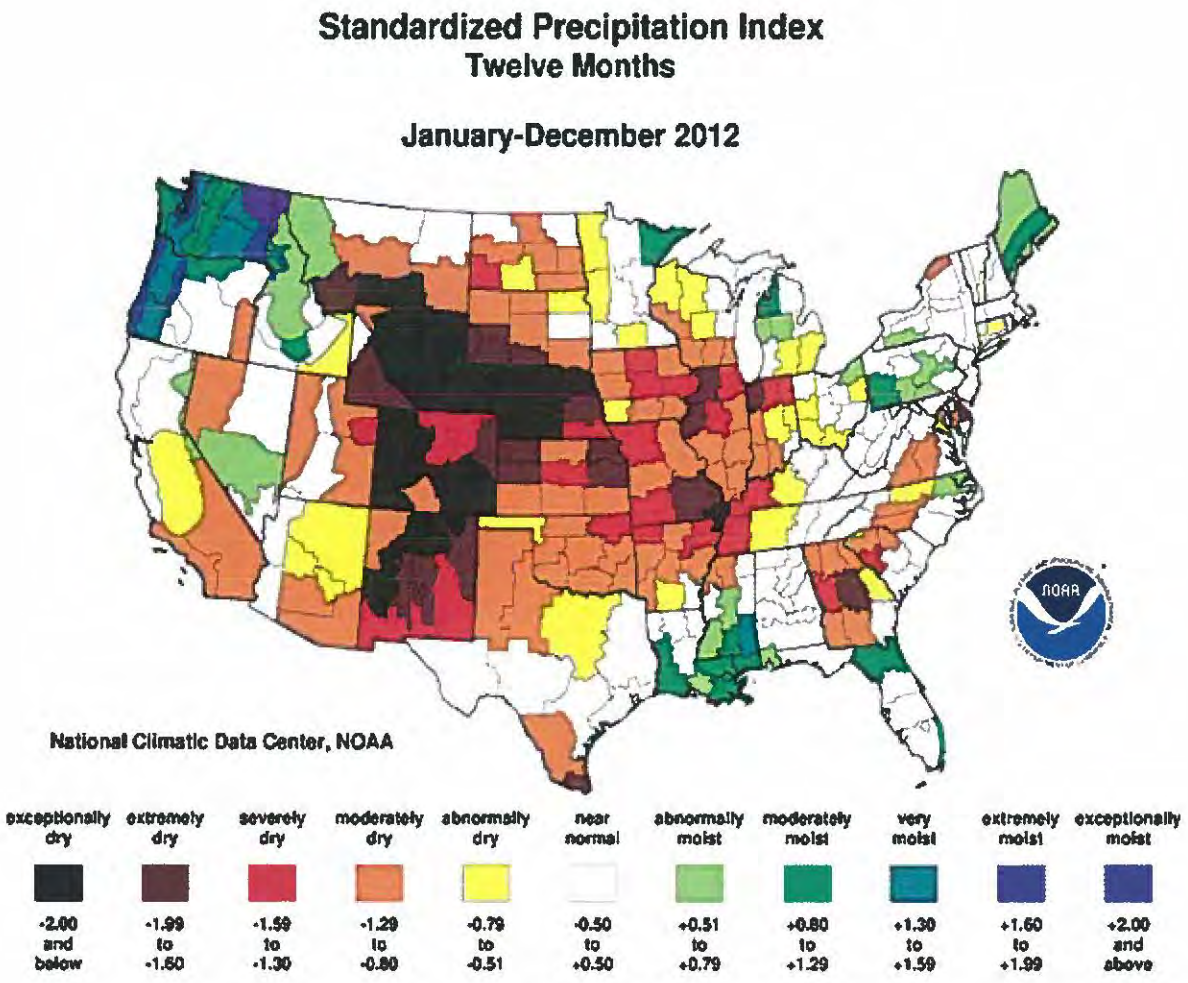


Figure E-6. 12-month SPI: NCDC/NOAA (2012)

APPENDIX F

Scott Able Canyon (Sacramento River to head of canyon)

Sacramento River (Arkansas Canyon to Scott Able Canyon)

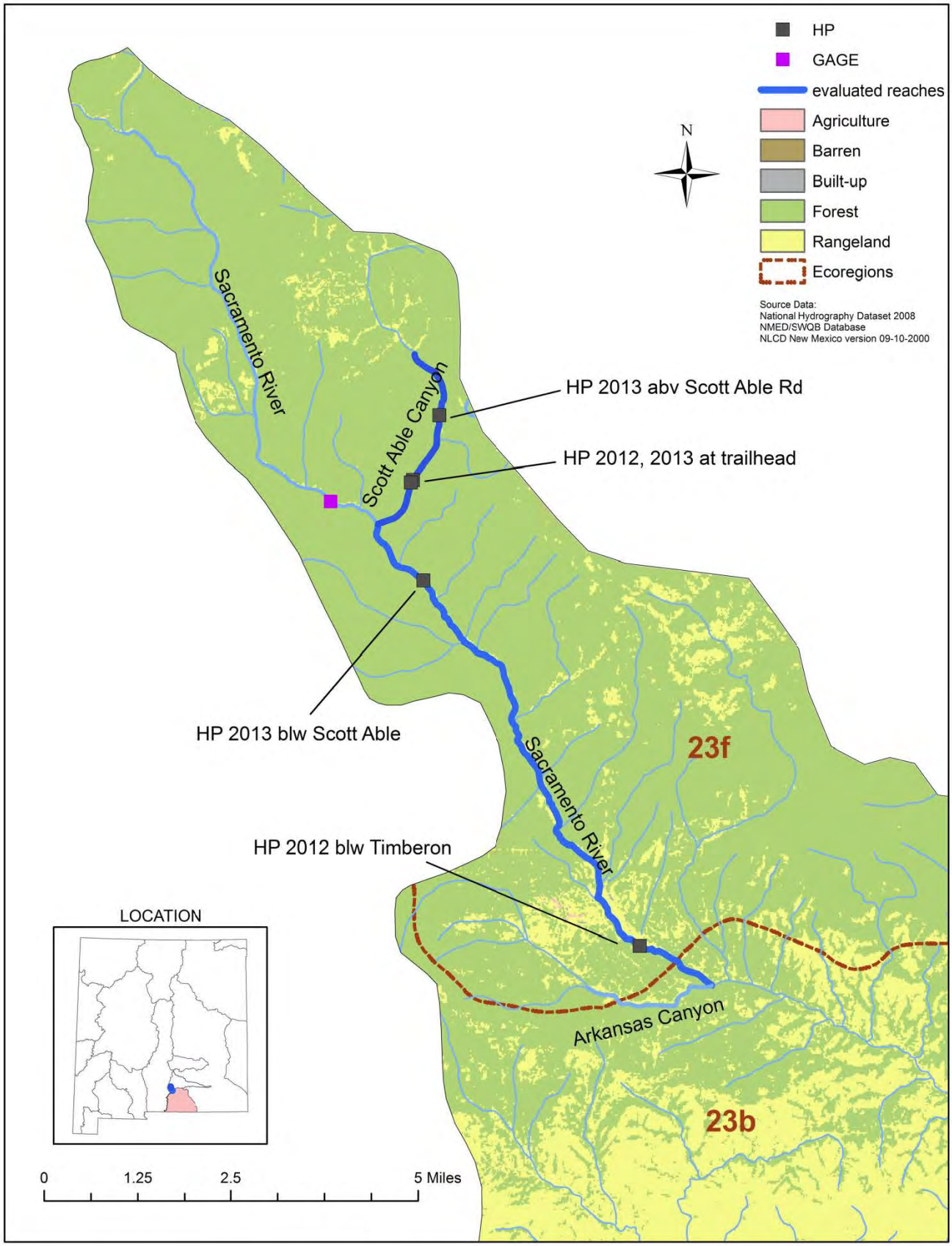


Figure F-1. Sacramento River and Scott Able Canyon Ecoregions and Land Use/Land Cover

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 9/26/12	**Stream Name:** Sacramento	**Latitude:** 32.04012
Evaluator(s): Doy, G. Huey	**Site ID:** Sacramento blw Timberon	**Longitude:** 105.65237
TOTAL POINTS: 1 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM-2805-00	**Drought Index (12-mo. SPI Value):** 0 to -1

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 20 %cloud cover ___ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ✓ showers (intermittent) ___ %cloud cover ___ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES ✓ NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ✓ YES ___ NO **Diversions** ✓ YES ___ NO **Discharges** ___ YES ___ NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	1

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with no bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
				SUBTOTAL (#1.1 – #1.9)
If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL. If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL. YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.				
1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.	
	3	1.5	0	
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
				TOTAL POINTS (#1.1 – #1.12)

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
		TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Photo Descriptions and NOTES

Photo #	Description (US, DS, LB, RB, etc.)	Notes

NOTES:

Large vault in channel at Scott Able Canyon consumed spring runoff. Later in the season channel went dry above Scott Able.

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 5-7-13	**Stream Name:** Sacr River	**Latitude:** 32.69897
Evaluator(s): DS, SM	**Site ID:** 1 mi b/w Scott Ab	**Longitude:** 105.73331
TOTAL POINTS: 15.5 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM 2805-00	**Drought Index (12-mo. SPI Value):** -1 - -1.5

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 10 %cloud cover ___ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover X clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES X NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ___ YES X NO **Diversions** X YES ___ NO **Discharges** ___ YES X NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
dry caddisfly cases	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach -- riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two. some willow	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	4

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with no bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some "flow" but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.9)	8.5

If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.

1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.
	3	1.5	0
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.
	Present = 3		**Absent = 0**
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
			TOTAL POINTS (#1.1 – #1.12)	15.5

intermittent

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
	TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)	

1543-1554

Sacramento R

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Photo Descriptions and NOTES

Photo #	Description (US, DS, LB, RB, etc.)	Notes
1525-27	Abv Scott Able	
1528-38	b/w Scott Able	
1539-41	b/w Timberon	2012 HP
1543-51	1 mi b/w scott Able	2013 HP

NOTES:

some dry caddisfly casings.

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Tr. No. 126

Date: 10-24-12	**Stream Name:** Scott Able at	**Latitude:** 32.71830
Evaluator(s): SL, GH	**Site ID:** Scott Able Trailhead	**Longitude:** -105.73585
TOTAL POINTS: 2 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM2805_01	**Drought Index (12-mo. SPI Value):** 0 to -1

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover X clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) ___ %cloud cover X clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES X NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** Road x-ing above **Stream Modifications** ___ YES X NO **Diversions** ___ YES X NO **Discharges** ___ YES X NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation spotty differences but not consistent rip. veg.	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	2

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with n bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.9)	

If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.

1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.	
	3	1.5	0	
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
			TOTAL POINTS (#1.1 – #1.12)	

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
	TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)	

QC replicate

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 5-8-13	**Stream Name:** Scott Able	**Latitude:** 32.71780
Evaluator(s): DS	**Site ID:** @ Trailhead	**Longitude:** 105.73632
TOTAL POINTS: 8 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM 2805.01	**Drought Index (12-mo. SPI Value):** -1 - -1.5

WEATHER CONDITIONS	**NOW:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 20 %cloud cover ___ clear/sunny	**PAST 48 HOURS:** ___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 10 %cloud cover ___ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES X NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER:** **Stream Modifications** ___ YES X NO **Diversions** ___ YES X NO **Discharges** ___ YES X NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	3

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with no bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.9)	5.5
If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL. If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL. YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.				
1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.	
	3	1.5	0	
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
			TOTAL POINTS (#1.1 – #1.12)	8

QC replicate

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
	TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14)	

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Date: 5-8-13	**Stream Name:** Scott Able	**Latitude:** 32.73074
Evaluator(s): DS, SM	**Site ID:** abv FR xing	**Longitude:** 105.72991
TOTAL POINTS: 28 *Stream is at least intermittent if ≥ 12*	**Assessment Unit:** NM 2805.01	**Drought Index (12-mo. SPI Value):** -1 - -1.5

	NOW:	PAST 48 HOURS:	
WEATHER CONDITIONS	___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 20 %cloud cover ___ clear/sunny	___ storm (heavy rain) ___ rain (steady rain) ___ showers (intermittent) 10 %cloud cover ___ clear/sunny	**Has there been a heavy rain in the last 48 hours?** ___ YES X NO **Field evaluations should be performed at least 48 hours after the last known major rainfall event. **OTHER**: **Stream Modifications** ___ YES X NO **Diversions** ___ YES X NO **Discharges** ___ YES X NO **Explain in further detail in NOTES section

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.1. Water in Channel	Flow is evident throughout the reach. Moving water is seen in riffle areas but may not be as evident throughout the runs.	Water is present in the channel but flow is barely discernable in areas of greatest gradient change (i.e. riffles) or floating object is necessary to observe flow.	Dry channel with standing pools. There is some evidence of base flows (i.e. riparian vegetation growing along channel, saturated or moist sediment under rocks, etc)	Dry channel. No evidence of base flows was found.
	6	4	2	0
1.2. Fish	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Fish are not present.
	3	2	1	0
1.3. Benthic Macroinvertebrates	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Macroinvertebrates are not present.
	3	2	1	0
1.4. Filamentous Algae/Periphyton	Found easily and consistently throughout the reach.	Found with little difficulty but not consistently throughout the reach.	Takes 10 or more minutes of extensive searching to find.	Filamentous algae and/or periphyton are not present.
	3	2	1	0
1.5. Differences in Vegetation	Dramatic compositional differences in vegetation are present between the stream banks and the adjacent uplands. A distict riparian vegetation corridor exists along the entire reach – riparian, aquatic, or wetland species dominate the length of the reach.	A distinct riparian vegetation corridor exists along part of the reach. Riparian vegetation is interspersed with upland vegetation along the length of the reach.	Vegetation growing along the reach may occur in greater densities or grow more vigorously than vegetation in the adjacent uplands, but there are no dramatic compositional differences between the two.	No compositional or density differences in vegetation are present between the streambanks and the adjacent uplands.
	3	2 1.5	1	0
1.6. Absence of Rooted Upland Plants in Streambed	Rooted upland plants are absent within the streambed/thalweg.	There are a few rooted upland plants present within the streambed/thalweg.	Rooted upland plants are consistently dispersed throughout the streambed/thalweg	Rooted upland plants are prevalent within the streambed/thalweg.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.6)	10.5

If the stream being evaluated has a subtotal ≤ 2 at this juncture, the stream is determined to be EPHEMERAL.
If the stream being evaluated has a subtotal ≥ 18 at this point, the stream is determined to be PERENNIAL.
YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 2 and 18 continue the Level 1 Evaluation.

LEVEL 1 INDICATORS	STREAM CONDITION			
	Strong	Moderate	Weak	Poor
1.7. Sinuosity	**Ratio > 1.4.** Stream has numerous, closely-spaced bends, few straight sections.	**Ratio < 1.4.** Stream has good sinuosity with some straight sections.	**Ratio < 1.2.** Stream has very few bends and mostly straight sections.	**Ratio = 1.0.** Stream is completely straight with no bends.
	3	2	1	0
1.8. Floodplain and Channel Dimensions	**Ratio > 2.5.** Stream is minimally confined with a wide, active floodplain.	**Ratio between 1.2 and 2.5.** Stream is moderately confined. Floodplain is present, but may only be active during larger floods.	**Ratio < 1.2.** Stream is incised with a noticeably confined channel. Floodplain is narrow or absent and typically disconnected from the channel.	
	3	1.5	0	
1.9. In-Channel Structure: Riffle-Pool Sequence	Demonstrated by a frequent number of riffles followed by pools along the entire reach. There is an obvious transition between riffles and pools.	Represented by a less frequent number of riffles and pools. Distinguishing the transition between riffles and pools is difficult.	Stream shows some flow but mostly has areas of pools or of riffles.	There is no sequence exhibited.
	3	2	1	0
			SUBTOTAL (#1.1 – #1.9)	16.5
If the stream being evaluated has a subtotal ≤ 5 at this juncture, the stream is determined to be EPHEMERAL. If the stream being evaluated has a subtotal ≥ 21 at this point, the stream is determined to be PERENNIAL. YOU MAY STOP THE EVALUATION AT THIS POINT. If the stream has a subtotal between 5 and 21 continue the Level 1 Evaluation.				
1.10. Particle Size or Stream Substrate Sorting	Particle sizes in the channel are noticeably different from particle sizes in areas close to but not in the channel. There is a clear distribution of various sized substrates in the stream channel with finer particles accumulating in the pools, and larger particles accumulating in the riffles/runs.	Particle sizes in the channel are moderately similar to particle sizes in areas close to but not in the channel. Various sized substrates are present in the stream channel and are represented by a higher ratio of larger particles (gravel/cobble).	Particle sizes in the channel are similar or comparable to particle sizes in areas close to but not in the channel. Substrate sorting is not readily observed in the stream channel.	
	3	1.5	0	
1.11. Hydric Soils	Hydric soils are found within the study reach.		Hydric soils are not found within the study reach.	
	Present = 3		**Absent = 0**	
1.12. Sediment on Plants and Debris	Sediment found readily on plants and debris within the stream channel, on the streambank, and within the floodplain throughout the length of the stream.	Sediment found on plants or debris within the stream channel although it is not prevalent along the stream. Mostly accumulating in pools.	Sediment is isolated in small amounts along the stream.	No sediment is present on plants or debris.
	1.5	1	0.5	0
			TOTAL POINTS (#1.1 – #1.12)	24

SUPPLEMENTAL INDICATORS: The following indicators do not occur consistently throughout New Mexico but may be useful in the determination of perenniality. If the indicator is present record score below and tally with previous score to compute TOTAL.		
1.13. Seeps and Springs	Seeps and springs are found within the study reach.	Seeps and springs are not found within the study reach.
	Present = 1.5	**Absent = 0**
1.14. Iron Oxidizing Bacteria/Fungi	Iron-oxidizing bacteria and/or fungi are found within the study reach.	Iron-oxidizing bacteria and/or fungi are not found within the study reach.
	Present = 1.5	**Absent = 0**
		TOTAL *plus* SUPPLEMENTAL POINTS (#1.1 – #1.14) 27

Scott Able

NMED Surface Water Quality Bureau – LEVEL 1 Hydrology Determination Field Sheet

Photo Descriptions and NOTES

Photo #	Description (US, DS, LB, RB, etc.)	Notes
1555-80	abv FR	HP 2013

NOTES:

flood scour in The past still very evident.
FR crosses creek below 4H camp..
Many dry caddisfly casings. Live cadd's fly in seep.

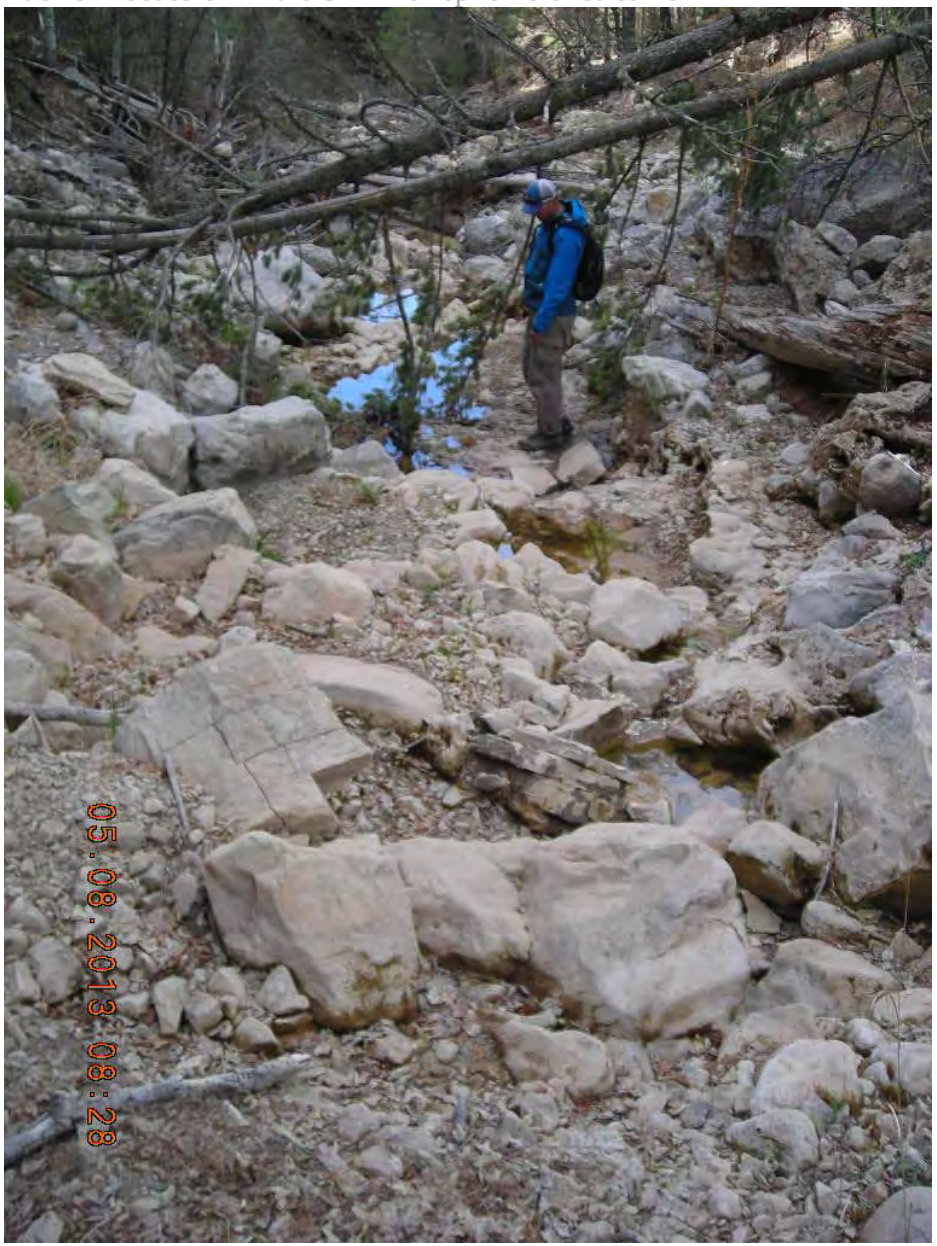


Figure F-2. Pools above road crossing on Scott Able Canyon

Figure F-3. Sacramento River below Scott Able Canyon