TECHNICAL SUPPORT DOCUMENT

New Mexico's Standards For Interstate and Intrastate Surface Waters 20.6.4 NMAC

Amendments to the Perennial Portions of Tecolote Creek in the Pecos Watershed

U.S. EPA REGION 6
WATER QUALITY PROTECTION DIVISION

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I. Introduction

Background

The purpose of this Technical Support Document (TSD) is to provide the results of the U.S. Environmental Protection Agency's (EPA) review of amendments to New Mexico's *Standards for Interstate and Intrastate Surface Waters 20.6.4 NMAC*. The New Mexico Environment Department's (NMED) Surface Water Quality Bureau (SWQB) developed a Use Attainability Analysis (UAA) consistent with the federal regulations to determine the most appropriate and protective aquatic life use for Tecolote Creek. (See 40 CFR §131.10(g)(l)).

The EPA and SWQB staff engaged in early discussions on the proposal to amend the current high quality coldwater designated uses for Tecolote Creek. The supporting UAA for Tecolote Creek was intended to determine if high water temperatures resulting from ambient air temperatures prevent the attainment of the high quality coldwater aquatic life use in Tecolote Creek. The New Mexico Water Quality Control Commission (Commission) subsequently adopted amendments revising the designated uses applicable to the perennial portions of Tecolote Creek.

Chronology of Events

The SWQB developed a UAA entitled *Aquatic Life Use Designation for Tecolote Creek, U.S. Interstate 25 (I-25) to Blue Creek, San Miguel County, NM* (2017) consistent with federal regulations to determine the most appropriate and protective aquatic life use for Tecolote Creek. See 40 CFR §131.10(g)). The SWQB initially submitted the draft *Tecolote Creek UAA* to EPA for technical approval of UAA pursuant to 20.6.4.15 of the New Mexico Administrative Code (NMAC) on September 1, 2017. In its December 12, 2017 response, EPA noted that technical review under 20.6.4.15(c) NMAC is specifically limited to UAAs based on the SWQB's hydrology protocol (latest edition) consistent with 40 CFR 131.10(g)(2). EPA provided comments to the SWQB on the draft *Tecolote Creek UAA* on January 9, 2018.

The public notice for a hearing on these amendments by the Commission was published in the New Mexico Register on October 31, 2017. The Commission held this public hearing and later the same day held its deliberative hearing. In its deliberative hearing the Commission adopted NMED's proposed amendments to 20.6.4 NMAC on January 9, 2018. The Commission amended 20.6.4.215 NMAC to exclude Tecolote Creek and create a new segment 20.6.4.230 NMAC for Tecolote Creek upstream of I-25 to Blue Creek, removing the high quality cold water and applying the coolwater designated use to this new segment. The New Mexico Attorney General's (AG) office certified that the revised standards became effective as state law on February 13, 2018. The AG's office also submitted the revisions to EPA by letter dated March 23, 2018.

Summary of the Revisions to 20.6.4 NMAC

To change the aquatic life use designation for Tecolote Creek from Blue Creek to I-25, (AU NM-2212_10), from a high quality coldwater aquatic life use to a coolwater aquatic life use, the Commission revised 20.6.4.215 NMAC to exclude Tecolote Creek:

20.6.4.215 PECOS RIVER BASIN - Perennial reaches of the Gallinas river and all its tributaries upstream of the diversion for the Las Vegas municipal reservoir and perennial reaches of Tecolote creek and its perennial tributaries upstream of Blue Creek.

A. Designated Uses: domestic water supply, high quality coldwater aquatic life, irrigation, livestock watering, wildlife habitat, industrial water supply and primary contact; and public water supply on the Gallinas river.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: specific conductance 300 µS/cm or less (450 µS/cm or less in Wright Canyon creek); the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

To implement the revised high quality coldwater to coolwater aquatic life use change in (NM-2212_10), Tecolote Creek (I-25 to Blue Creek), the Commission created 20.6.4.230 NMAC as a new water quality standards segment:

20.6.4.230 PECOS RIVER BASIN - Tecolote Creek from I-25 to Blue Creek.

A. Designated Uses: domestic water supply, coolwater aquatic life, irrigation, livestock watering, wildlife habitat and primary contact.

B. Criteria: the use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses, except that the following segment-specific criteria apply: the monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less, single sample 235 cfu/100 mL or less.

II. Basis for Designated Use Change

2.1 Problem Identification

Tecolote Creek from its confluence with Blue Creek to I-25 was initially identified for exceeding temperature criteria on the State of New Mexico's 1996 Clean Water Act §303(d) List. This segment of Tecolote Creek remains listed on the state's current 303(d) List (NMED/SWQB 2016) as not supporting the high quality cold water aquatic life use resulting from exceedances of nutrient/eutrophication, specific conductance and temperature. In its Record of Decision for that Integrated List, NMED stated that the high quality cold water aquatic life use may not be appropriate and that a review of the segment-specific use designation was warranted (NMED/SWQB, 2016).

Consistent with federal regulations and section 20.6.4.6.15 NMAC of New Mexico's water quality standards, the *Tecolote Creek UAA* was developed to allow the SWQB and Commission to determine if the high quality coldwater aquatic life use designation is appropriate and attainable in Tecolote Creek from Blue Creek to I-25. See 40 CFR 131.10(g).

2.2 Discussion of the Tecolote Creek UAA

2.2.1 Watershed Description/Ecoregion Analysis and History

Level IV ecoregions in New Mexico have been classified in three sedimentation categories – Mountain (M), Foothills (F), and Xeric (X) - based on principal component analysis of habitat variables. (Griffith et al., 2006). The Tecolote Creek watershed covers 284 square miles. The headwaters of Tecolote Creek originate within Level IV Ecoregions 21b (M) and 21c (M), in sub-alpine forest above 9400 feet (ft.) in elevation on the southeast slope of Elk Mountain in the Sangre de Cristo Mountains. Tecolote Creek then descends into Ecoregions 21f (M) and 21d (F), mid-elevation mixed conifer and ponderosa pine forest at approximately 6,800 ft. elevation. The upper portion of the creek runs a total of 54 miles. Crossing I-25, Tecolote Creek then runs through piñon-juniper woodlands and savannas Ecoregions 21h (X) and becomes non-perennial for 26 miles until its confluence with the Pecos River at Tecolotito, NM.

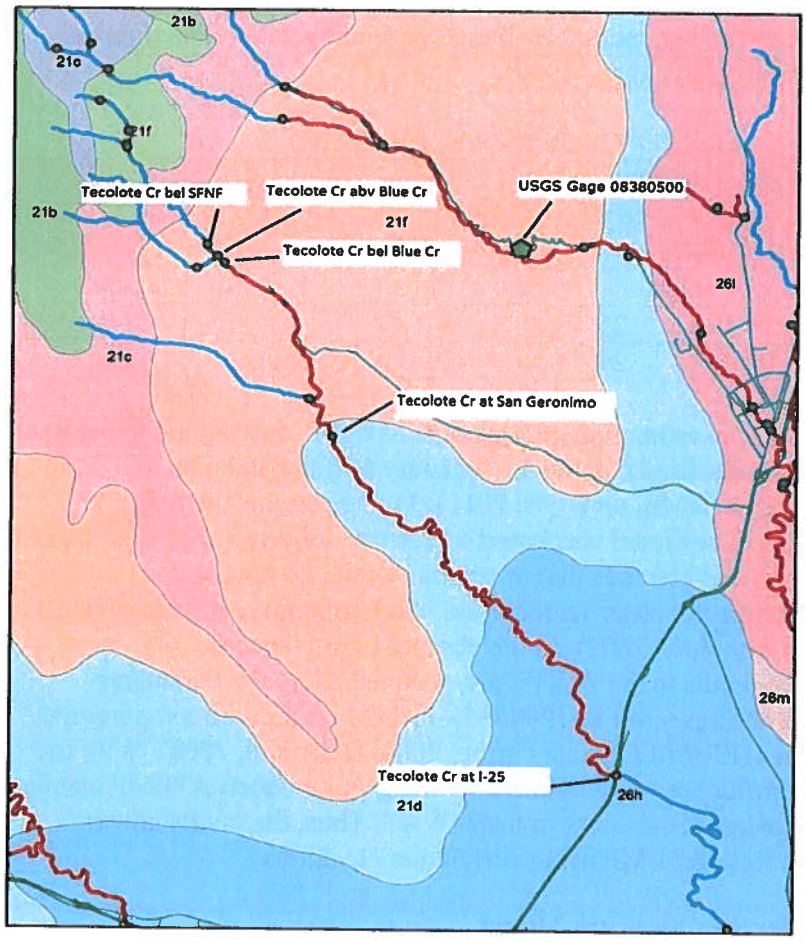

Figure 1. Tecolote Creek above I-25, showing USEPA Level IV ecoregions, USGS Gage 08380500-Gallinas Creek near Montezuma and selected SWQB monitoring stations. Impaired Assessment Units are shown in red.

The *Tecolote Creek UAA* cites Jessup et al. (2010) noting that New Mexico streams in mountain, foothill and xeric Level IV Ecoregions roughly correspond to the aquatic life use designations of high quality coldwater, marginal coldwater, coolwater and warmwater and marginal warmwater, respectively as illustrated in **Figure 1**.

2.2.2 Air-Water Temperature Correlation Model

New Mexico's water quality standards (NMAC, 2013) describe how numeric water quality temperature criteria for specific aquatic life uses are defined. The supporting criteria are expressed in terms of maximum temperature (T_{MAX}), not to be exceeded for four or more consecutive hours in a 24-hour period on more than three consecutive days (4T3), and the temperature not to be exceeded for six or more consecutive hours in a 24-hour period on more than three consecutive days (6T3). The SWQB developed an Air-Water Temperature Correlation (AWTC) model to allow the use of Maximum Weekly Average Temperature (MWAT) to model chronic temperature trends in waters where there are limited temperature datasets available. The MWAT statistic has been widely used and supported by literature relating MWAT to thermal requirements of freshwater fish (Brungs and Jones, 1977).

Table 1. Aquatic life use temperature criteria (°C) (20.6.4.900. H. NMAC)

Criterion	High Quality Coldwater	Coldwater	Marginal Coldwater	Coolwater	Warmwater	Marginal Warmwater
4T3	20	-	-	-	-	-
6T3	-	20	25	-	-	-
Tmax	23	24	29	29	32.2	32.2

The AWTC model allows for the estimation of attainable MWAT, maximum temperature (T_{MAX}), 4T3 and 6T3 water temperatures based on the 30-year July average ambient air temperature (ATEMP) for a given area (NMED/SWQB, 2011). July represents the highest average temperature in New Mexico. The model was based on recorded thermograph data from 293 stream locations in New Mexico and assumes that in streams which do not receive groundwater inputs sufficient to change the water temperature. Air temperature has the greatest influence on stream temperature (Bartholow, 2002). In the absence of site-specific thermographic data, air temperature inputs to the AWTC are obtained using the Parameter-elevation Regression on Independent Slopes Model (PRISM). PRISM predicts air temperatures based on site-specific characteristics (PRISM Climate Group, 2004; Daly et al, 2008). With the AWTC model, absent appreciable influence of microclimates and ground water, ATEMP can be determined through PRISM and is nearly equivalent to the MWAT. Thus, the model allows T_{MAX}, 4T3 or 6T3 to be calculated from ATEMP using correlation equations.

2.2.3 Application of the Air-Water Temperature Model

The aquatic life uses defined in New Mexico's water quality standards contain numeric temperature criteria, except for the limited aquatic life use. These temperature criteria are based on the thermal preferences of fish species found in New Mexico's waters. Tecolote Creek from its headwaters to I-25 is currently designated for the high quality coldwater aquatic use. The

associated 4T3 temperature criteria range for high quality coldwater aquatic use is 20°C with a maximum temperature of 23°C. The UAA contends that naturally occurring pollutant concentrations. i.e., high ambient air temperatures prevent the attainment of the high quality coldwater aquatic life use in Tecolote Creek from Blue Creek downstream to I-25. See 40 CFR §131.10(g)(1). To determine if the proposed coolwater designated aquatic life use is appropriate from Blue Creek to I-25, the UAA relied on the SWQB's ATWC model to estimate the effect of ambient air temperatures throughout Tecolote Creek. Where measured temperatures are warmer than predicted by the ATWC model, it indicates impairment. If measured and predicted temperatures are similar, the water body is likely achieving its natural air temperature-driven thermal condition. Cooler measured temperatures than predicted may indicate the influence of groundwater.

The SWQB applied its ATWC model using the average July air temperatures from PRISM for the 1981-2010 reference period. To account for annual variability, records from the nearest National Weather Service (NWS) station in the Pecos National Historic Park were used to determine how the years with thermograph data compared to the reference PRISM data. The PRISM data was applied within 800-meter grid cells at each of the monitoring sites on Tecolote Creek to predict T_{MAX}, 4T3 and 6T3. The modeled values were then compared to actual thermograph data collected in 2001, 2010 and 2016 from Tecolote Creek. The July mean temperature departure was reported as +1.6 °C. The UAA noted that data points were missing for June and July of 2010 and that data from May and August were 0.7 and 0.9 °C warmer, respectively, than the (July) reference period. This resulted in an averaged correction factor of +0.8 °C that was used (**Table 3**) to adjust the July average temperature in that year for departure from normal.

The UAA described this adjustment process as improving the accuracy of the AWTC model in predicting T_{MAX}, 4T3and 6T3 for the assessment unit running from Blue Creek to I-25, stating that the data illustrates that in warmer-than-average years, actual water temperatures are likely to exceed the values modelled using ATEMP, because warmer air temperatures reduce the difference between predicted and observed values. However, it is unclear how accurate the correction factor derived with missing data points is and what affect its use will have on the predicted accuracy of the AWTC modelled results. Although it is unclear how the missing data points influenced the final calculations, the modelled results for the average correction factor appear to be reasonable since the temperature in a given month is largely correlated with the surrounding months.

The modelled (predicted) values and the (observed) thermographic values reported are shown in **Table 2** and **Table 3** below. Based on these values, at all Tecolote Creek monitoring stations, ATEMP was between 18°C and 23°C. Based on this data, the model predicts that marginal coldwater or coolwater aquatic life use may be the most protective use attainable. Although both the marginal coldwater and coolwater aquatic life uses have T_{MAX} criteria of 29°C, these two uses describe different habitat conditions. The marginal coldwater use describes habitat where natural intermittent or low flows or other natural habitat conditions occur that would severely limit a coldwater aquatic life community. The coolwater aquatic life use means the water temperature and other characteristics are suitable for the support or propagation of

aquatic life that are intermediate between warm and coldwater aquatic life. Since Tecolote Creek is a perennial stream, the coolwater aquatic life use better describes habitat in Tecolote Creek.

Table 2. AWTC model predicted compared to observed temperatures for Tecolote Creek

Monitoring Station	Year	ATEMP[a] °C	TMAX (P/O)[b] °C	4T3 (P/O)[b] °C	6T3 (P/O)[b] °C
Tecolote Creek (Blue Creek to headwaters): NM-2212_09					
Below SFNF Boundary*	2001	18.1	24.3/ 17.2	21.0/ 15.9	19.9/ 14.8
Tecolote Creek (I-25 to Blue Creek): NM-2212_10					
At Blue Haven**	2016	18.8	25.1/ 18.9	21.7/ 16.7	20.7/ 16.3
Near San Geronimo	2001	20.1	26.5/ 27.4	23.1/ 24.9	22.0/ 23.9
	2016		26.5/ 26.9	23.1/ 23.7	22.0/ 22.5
At I-25	2010	21.6	28.1/ 29.6	24.7/ 27.3	23.5/ 26.0
	2016		28.1/ 31.1	24.7/ 26.9	23.5/ 25.5

* the Below SFNF (Santa Fe National Forest) Boundary monitoring station is located 0.7 km above the confluence with Blue Creek

** Blue Haven is not a designated SWQB monitoring station; it is located approximately 2 km downstream from the confluence with Blue Creek

(a) PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, accessed 25 Oct 2016

(b) P/O – Predicted/ Observed

Table 3. AWTC model predicted temperatures compared to observed temperatures for Tecolote Creek adjusted for variation from 30-year normal

Monitoring Station	Year	ATEMP[a] °C	TMAX (P/O)[b] °C	4T3 (P/O)[b] °C	6T3 (P/O)[b] °C
Tecolote Creek (Blue Creek to headwaters): NM-2212_09					
Below SFNF Boundary*	2001	19.7	26.0/ 17.2	22.7/ 15.9	21.6/ 14.8
Tecolote Creek (I-25 to Blue Creek): NM-2212_10					
Near San Geronimo	2001	21.7	28.2/ 27.4	24.8/ 24.9	23.7/ 23.9
At I-25	2010	22.4	28.9/ 29.6	25.6/ 27.3	24.4/ 26.0

Below SFNF (Santa Fe National Forest) Boundary monitoring station is located 0.7 km above the confluence with Blue Creek

(a) PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, accessed 25 Oct 2016

(b) P/O – Predicted/ Observed

The measured water temperature for the stations in the assessment units from the Tecolote Creek headwaters to Blue Creek and those in the upper portions of the downstream assessment unit running from Blue Creek to I-25 were several degrees cooler than the AWTC model predicted, with or without correcting for air temperature departure from normal. This difference could be the result of groundwater input above the monitoring stations moderating the influence of ambient air temperature on water temperature, resulting in reduced diel swings in water temperature. The SWQB considered this possibility and compared thermograph records from downstream of the Santa Fe Nation Forest boundary and at the Blue Haven Creek site to look for indications of groundwater input. The diel swings reported from both sites were slightly reduced when compared to the downstream monitoring site at San Geronimo but were not large enough clearly indicate that groundwater was influencing the values. However, there is a rapid

temperature change that occurs somewhere between Blue Haven and the San Geronimo sites. The downstream I-25 monitoring site was reported as exceeding the marginal coldwater and coolwater aquatic life use T_{MAX} criterion of 29°C in both 2010 and 2016. The UAA noted that this was likely be the result of water quality impairment from roads from the 2010 survey referred to earlier. Roads and associated riparian habitat loss are likely a factor in increased water temperatures downstream near towns of San Geronimo and further downstream at Tecolotito, NM at the I-25 site.

Given that the revised beneficial use designation relies on the results of the AWTC model outputs, it is important to consider potential sources of error. One possible source of error could come from the use of the 1981-2010 PRISM reference data set itself. Large data sets can have a leveling affect, smoothing out those years with significant variation. The SWQB considered annual variability in its comparison of the PRISM air temperature reference data to the available air temperature record data from the NWS Pecos National Historic Park station. This required the use of an average correction factor to adjust the average air temperature for a given year for departure from normal. In combination with inter-annual variation in the actual water temperatures recorded, this could lead to differences between the observed and predicted results. There was no discussion of possible intra-annual variation of temperature during the 2001 and 2010 temperature monitoring events. As a result, it is unclear if ambient air temperatures were generally normal when the observed temperature readings were made at the NWS station or if these data where lower or higher than average.

The UAA did characterize streamflow conditions where thermograph data are used. The SWQB looked at discharge data from the closest USGS gage, 08380500 – Gallinas Creek near Montezuma, NM. Although this gage is located 9 km (~5.5 miles) from the nearest point on Tecolote Creek, it sits at a similar latitude and elevation as Tecolote Creek between Blue Creek and San Geronimo. The Gallinas watershed was described as having similar physical characteristics to Tecolote Creek. Three years of thermograph data (2001, 2010 and 2016) where compared. All years had greater than average spring snowmelt runoff. The summer of 2001 appears to have had slightly less than average flow, while summer 2010 included two large storm events resulting in greater than average flow, the summer 2016 data showed a three-week long period that was dryer than normal. This suggests that flow conditions in Tecolote Creek were relatively stable during the 2001 to 2016 time frame.

The second possible source of error could result from the PRISM model's interpolation of values based on the use of a minimum 800-meter map grid cell (640,000 m^2). In mountainous areas, the ATWC model integrates data from a range of elevations within grid cells where air temperatures may vary significantly, potentially reducing the precision of the results. To address this potential source of variability, the SWQB used air temperature records from the NWS station to determine how the years when data was collected compared to the 1981-2010 PRISM reference data to determine the departure from normal described earlier. The NWS station is approximately 23 kilometers (km) (~14 miles) away from the nearest point on Tecolote Creek and at a similar elevation and latitude as the San Geronimo monitoring site. The NWS station is not identified on any of the maps provided in the UAA making it unclear if the station is in the same Level IV (21d) foothills ecoregion as the San Geronimo site. Although not directly discussed, given the proximity, the San Geronimo site likely has the same high desert climate

found at the NWS station in the Pecos National Historical Park, where weather variations from year to year and sometimes season to season typically occur (National Park Service, 2018).

2.2.4 Effect of Temperature on Aquatic Life

As noted earlier, New Mexico's aquatic life use designations contain numeric temperature criteria that are based on the thermal preferences of fish species in New Mexico. Further, the *Tecolote Creek UAA* describes the state's use designations as being based on scientific consensus, review of the available research, and best professional judgment (Morrow and Fischenich, 2000). To support a determination on the appropriate aquatic life use for Tecolote Creek, in the SWQB looked at existing fish survey data to support the appropriate use designation for Tecolote Creek based on temperature preference. The data reported in the UAA includes both relatively recent and historical (1939-1975) survey data on fish species (**Table 4**). The data support a conclusion that species composition has remained relatively stable within the past 80 years, but that it remains possible that the fish community may have changed in response to anthropogenic factors during the period prior to 1939.

The UAA reports data from 2001 and 2010 (NMED/SWQB) and historical (1939-1975) survey data on fish species (**Table 4**). The 2001 survey data show that only non-native coldwater species have been documented with brown trout (*Salmo trutta*) predominating at the Santa Fe National Forest site (AU NM 2112-09). Downstream at the San Geronimo site (AU NM 2112-10), 2001 survey data coolwater species predominate, except for some brown trout that are likely in the upper end of the assessment unit. Although there is data from both 2001 and 1975 from San Geronimo site identifying the presence of coolwater species, longnose dace (*Rhinichthys cataractae*) and Rio Grande chub (*Gila pandora*), the 1975 data did not quantify the number of fish sampled. Further downstream at the I-25 site (AU NM 2112-10), the 2001 survey data reported fish counts for the longnose dace, Rio Grande chub and a few (warmwater) green sunfish (*Lepomis cyanellus*). Although the 2010 survey also identified both the longnose dace and Rio Grande chub near San Geronimo, they were reported as too numerous to count. While there were likely a significant number of both species taken in 2010, there is no way to accurately compare the 2001 and 2010 sampling events. Similarly, there is no way to compare the 2001 sampling event counts to the historical sampling events (1939-1975).

Without comparative data with actual fish counts at these sites or other sampling or reference sites, the historical data does not provide clear support for the contention that species composition has remained relatively stable in over the past 80 years. It is likely that the fish community may have changed in response to anthropogenic factors both prior to and since 1939. The widespread introduction of non-native species like brown trout have impacted fish communities, particularly in coldwater streams since the early 1900s. Since their introduction, brown trout have become the most widespread invasive trout species in New Mexico. Generally, introduced trout species will outcompete the native trout for food and space (Sublette et al. 1990). Brown trout prey on other species of trout and compete with them for food and living space (USDA, 2007) and can tolerate a broader range of water temperatures. This is likely the reason this species predominates from the headwaters to Blue Creek and are also found downstream below Blue Creek.

Table 4, Fish species found in Tecolote Creek

Common Name	Species name	Number	Year	Water Temperature Preference	Native?
Tecolote Creek below SFNF boundary: NM-2212_09					
Rainbow trout	*Oncorhynchus mykiss*	8	2001	cold	no
Cut-bow trout	*Oncorhynchus clarkii x mykiss*	2	2001	cold	no
Brown trout	*Salmo trutta*	66	2001	cold	no
Brook trout	*Salvelinus fontinalis*	16	2001	cold	no
Tecolote Creek at bridge near San Geronimo: NM-2212_10					
Brown trout	*Salmo trutta*	17	2001	cold	no
Rio Grande chub	*Gila pandora*	40	2001	cool	yes
Longnose dace	*Rhinichthys cataractae*	231	2001	cool	yes
		*P	1975		
Tecolote Creek at I-25 near Tecolote: NM 2112-10					
Longnose dace	*Rhinichthys cataractae*	TNTC**	2010	cool	yes
		157	2001		
		*P	1975		
		*P	1965		
		*P	1939		
Rio Grande chub	*Gila pandora*	TNTC**	2010	cool	yes
		160	2001		
		*P	1965		
		*P	1939		
Green sunfish	*Lepomis cyanellus*	3	2001	warm	no

* P= Present, not quantified; **TNTC= Too Numerous to Count

As noted earlier, there are other anthropogenic impacts identified as possibly contributing to degradation in Tecolote Creek, including the loss of riparian areas. Although the extent of loss of riparian cover is not discussed in detail, it may contribute to increased water temperatures as could flow reductions from active diversions. Riparian loss along with mining activities and associated stormwater discharges may impact fish communities in Tecolote Creek, particularly near San Geronimo down to I-25 near Tecolote, NM.

2.2.5 Summary Discussion of the Tecolote Creek UAA

It is EPA's obligation is to ensure that the revised designated uses that have been adopted by the Commission are based on a sound scientific rationale and are protective of the aquatic community. As described in the *Tecolote Creek UAA*, New Mexico's water quality standard focus on water temperature as the primary characteristic that defines its aquatic life subcategories. This UAA was developed to answer the question of whether the current high quality coldwater aquatic life use is attainable in Tecolote Creek from Blue Creek to I-25 as the result of naturally high ambient air temperatures. See 40 CFR 131.10(g)(1).

The *Tecolote Creek UAA* provided a clear physical description of the ecoregions and the transitions across the Pecos watershed. This information was important in understanding the variability in habitat and conditions throughout Tecolote Creek. The UAA considered both

relatively recent (2001, 2010) and historical (1939-1975) data for fish species found in Tecolote Creek and their general thermal preferences. This data consisted of numeric fish counts from a 2001 survey that represented the three assessment units on Tecolote Creek. With no comparative numeric fish count data for the 2010 or historical surveys, it was not possible to make direct comparisons to support the contention that species composition has remained relatively stable over the past 80 years. However, given that the 2010 data described as too numerous to count suggests that Tecolote Creek has been relatively stable from 2001 to 2010.

The *Tecolote Creek UAA* primarily relied on the ATWC model to estimate the effect of ambient air temperatures in determining the appropriate aquatic life use for Tecolote Creek. The UAA also used direct observed thermographic measurements throughout Tecolote Creek to confirm the modeled results. In the upper assessment unit, from the headwaters to Blue Creek near the Santa Fe National Forest boundary, measurements were several degrees cooler than the AWTC model predicted. The UAA considered the potential effect of groundwater, finding that the diel variation in the thermograph values indicated that groundwater was not affecting observed water temperatures. It is possible that the difference in the predicted and observed temperatures may be attributable to error related to integrating measurements from the higher elevation of the upper assessment unit into an $800m^2$ grid cell. In the lower assessment units, predicted values from Blue Haven, near San Geronimo and at I-25 were in close agreement to the thermograph values reported. The actual thermographic measurements provide the clearest support that the coolwater aquatic life use would be the most protective aquatic life use in these lower elevation assessment units. Based on the data presented through both the ATWC model predicted values and particularly the observed thermograph data, EPA agrees the coolwater aquatic life use is appropriate in the downstream assessment units from Blue Creek to I-25.

III. REVISED PROVISIONS EPA IS APPROVING

3.1 20.6.4.15 and 20.6.4.230 NMAC - Pecos River Basin

Based on a review of the supporting *Tecolote Creek UAA*, EPA agrees that the high quality coldwater aquatic life use is being attained in Tecolote Creek from its headwaters to Blue Creek (AU NM 2112-09). The EPA has determined that the current high quality coldwater aquatic life use is not attainable in Tecolote Creek from Blue Creek to I-25 (AU NM 2112-10) because "naturally occurring pollutant concentrations that prevent the attainment of the use" (40 CFR 131.10 (g)(1), and supports the amendments to 20.6.4.215 NMAC and the addition of 20.6.4.230 NMAC. The EPA considers the amendments supported by the *Tecolote Creek UAA* to be consistent with both federal regulations and Sec. 303(c) of the CWA.

3.1.1 Endangered Species Act

The EPA initiated consultation with U.S. Fish and Wildlife Service, but subsequently determined that its action will have "No Effect" on listed species within the Tecolote Creek action area.

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