EXECUTIVE SUMMARY

Section 303(d) of the Federal Clean Water Act requires states to develop Total Maximum Daily Load (TMDL) management plans for water bodies determined to be water quality limited. A TMDL documents the amount of a pollutant a water body can assimilate without violating a state's water quality standards. It also allocates that load capacity to known point sources and nonpoint sources at a given flow. TMDLs are defined in 40 Code of Federal Regulations Part 130 as the sum of the individual Waste Load Allocations for point sources and Load Allocations for nonpoint sources and background conditions, and includes a margin of safety.

The Upper Rio Grande watershed is located in north central New Mexico. For practical purposes, the Upper Rio Grande watershed was divided into two investigations (i.e., Part 1 and Part 2). The Upper Rio Grande watershed between the Cochiti Reservoir and Pilar, NM, was Part 2 of the Upper Rio Grande investigation and is discussed in this document. Part 1 of the Upper Rio Grande investigation from Pilar, New Mexico to the New Mexico-Colorado border was previously discussed in the *Final Draft Total Maximum Daily Load (TMDL) for the Upper Rio Grande Watershed (Part 1)* (NMED/SWQB 2004a). Stations for the Upper Rio Grande Watershed (Part 2) were located throughout the Upper Rio Grande watershed during an intensive watershed survey performed by the New Mexico Environment Department Surface Water Quality Bureau in 2001 to evaluate the impact of tributary streams. As a result of this monitoring effort, exceedences of New Mexico water quality standards for turbidity were documented on Embudo Creek (Rio Grande to Canada de Ojo Sarco), the Rio Grande (non-pueblo Santa Clara to Embudo Creek), and Rio Santa Barbara (Picuris Pueblo bnd to USFS bnd). Exceedences of the chronic aluminum criterion were documented on Little Tesuque Creek (Rio Tesuque to headwaters) and conditions at Embudo Creek (Rio Grande to Canada de Ojo Sarco) were determined to be impaired due to sedimentation/siltation (i.e., did not meet the narrative stream bottom deposits standard). This TMDL document addresses the above noted impairments as summarized in the table below.

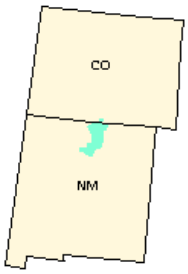
Additional impairments based on benthic macroinvertebrate bioassessments were documented on stream reaches based on 2001 data, but additional data is needed to determine the exact cause of these impairments. The effected stream reaches are: Rio Grande (non-pueblo Santa Clara to Embudo Creek); Embudo Creek (Canada de Ojo Sarco to Picuris Pueblo bnd); Rio Pueblo (Picuris Pueblo bnd to headwaters); and Rio Santa Barbara (Picuris Pueblo bnd to USFS bnd).

Additional water quality data will be collected by New Mexico Environment Department during the standard rotational period for intensive stream surveys. As a result, targets will be re-examined and potentially revised as this document is considered to be an evolving management plan. In the event that new data indicate that the targets used in this analysis are not appropriate and/or if new standards are adopted, the load capacity will be adjusted accordingly. When water quality standards have been achieved, the reach will be moved to the appropriate category on the Clean Water Act Integrated §303(d)/§305(b) list of waters.

The Surface Water Quality Bureau's Watershed Protection Section has and will continue to work with watershed groups to develop Watershed Restoration Action Strategies to develop and

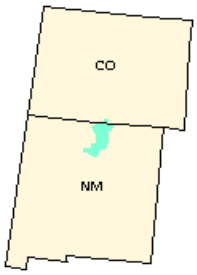
implement strategies to attempt to correct the water quality impairments detailed in this document. Implementation of items detailed in Watershed Restoration Action Strategies will be done with participation of all interested and affected parties.

TOTAL MAXIMUM DAILY LOAD FOR TURBIDITY AND SEDIMENTATION/SILTATION (STREAM BOTTOM DEPOSITS) EMBUDO CREEK (RIO GRANDE TO CANADA DE OJO SARCO)



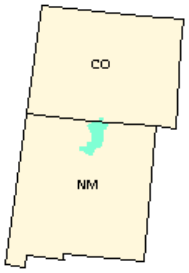
New Mexico Standards Segment	Rio Grande 20.6.4.114
Assessment Unit Identifier	Embudo Creek (Rio Grande to Canada de Ojo Sarco) NM-2111_41 (formerly NM-URG1-11000 [split])
Assessment Unit Length	6.2 miles
Parameters of Concern	Turbidity and Sedimentation/Siltation (Stream Bottom Deposits)
Uses Affected	Marginal Coldwater Fishery and Warmwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	317 mi^2
Land Type	Arizona/New Mexico Plateau Ecoregion (22)
Land Use/Cover	Forest (89%), Agriculture (4%), Tundra (3%), Rangeland (2%), Built-up (1%), Barren (<1%), Water (<1%), Wetlands (<1%)
Identified Sources	Channelization, dredging (e.g. for navigational channels), loss of riparian habitat, natural sources, off-road vehicles, rangeland grazing, site clearance (site development or redevelopment), streambank modifications/destabilization.
Land Management	U.S. Forest Service (74%), Private (9%), Native Lands (8%), BLM (7%), State (2%)
Priority Ranking	High
TMDL for: Turbidity Stream Bottom Deposits	 **WLA (0) + LA (16,630) + MOS (5,543) = 22,173 lbs/day** **WLA (0) + LA (15) + MOS (5) = 20 percent fines**

TOTAL MAXIMUM DAILY LOAD FOR ALUMINUM (CHRONIC)
LITTLE TESUQUE CREEK (RIO TESUQUE TO HEADWATERS)



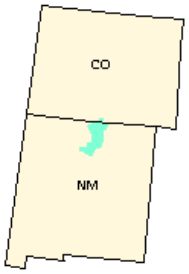
New Mexico Standards Segment	Rio Grande 20.6.4.121
Assessment Unit Identifier	Little Tesuque Creek (Rio Tesuque to headwaters) NM-2118.A_34 (formerly NM-URG1-10230)
Assessment Unit Length	8.26 miles
Parameters of Concern	Aluminum (Chronic)
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	78.4 mi^2
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Forest (91%), Rangeland (4%), Built-up (3%), Agriculture (<1%), Tundra (<1%)
Identified Sources	Natural sources
Land Management	Native Lands (40%), U.S. Forest Service (31%), Private (29%)
Priority Ranking	High
TMDL for: Aluminum (Chronic)	**WLA (0) + LA (0.48) + MOS (0.16) = 0.64 lbs/day**

TOTAL MAXIMUM DAILY LOAD FOR TURBIDITY
RIO GRANDE (NON-PUEBLO SANTA CLARA TO EMBUDO CREEK)



New Mexico Standards Segment	Rio Grande 20.6.4.114
Assessment Unit Identifier	Rio Grande (non-pueblo Santa Clara to Embudo Creek) NM-2111_12 (formerly NM-URG1-10000 [split])
Assessment Unit Length	14.8 miles
Parameters of Concern	Turbidity
Uses Affected	Marginal Coldwater Fishery and Warmwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	13,669 mi^2
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Forest (55%), Rangeland (37%), Agriculture (5%), Built-up (1%), Tundra (1%), Water (<1%)
Identified Sources	Loss of riparian habitat, natural sources, Highway/Road/Bridge runoff (non-construction related), irrigated crop production, rangeland grazing
Land Management	U.S. Forest Service (51%), Private (18%), BLM (16%), Native Lands (8%), State (7%)
Priority Ranking	High
TMDL for: Turbidity	**WLA (0) + LA (332,544) + MOS (110,847) = 443,391 lbs/day**

TOTAL MAXIMUM DAILY LOAD FOR TURBIDITY
RIO SANTA BARBARA (PICURIS PUEBLO BND TO USFS BND)



New Mexico Standards Segment	Rio Grande 20.6.4.123
Assessment Unit Identifier	Rio Santa Barbara (Picuris Pueblo bnd to USFS bnd) NM-2120.A_419(formerly NM-URG1-11100)
Assessment Unit Length	7.39 miles
Parameters of Concern	Turbidity
Uses Affected	High Quality Coldwater Fishery
Geographic Location	Rio Grande USGS Hydrologic Unit Code 13020101
Scope/size of Watershed	13,669 mi^2
Land Type	Southern Rockies Ecoregion (21)
Land Use/Cover	Forest (73%), Tundra (16%), Agriculture (7%), Rangeland (4%), Built-up (<1%)
Identified Sources	Loss of riparian habitat, rangeland grazing, site clearance (land development/redevelopment), source unknown, streambank modification/stabilization
Land Management	Federal Wilderness (66%), U.S. Forest Service (26%), Private (8%)
Priority Ranking	High
TMDL for: Turbidity	**WLA (0) + LA (1,753) + MOS (584) = 2,337 lbs/day**