APPENDIX A

TABLES AND FIGURES

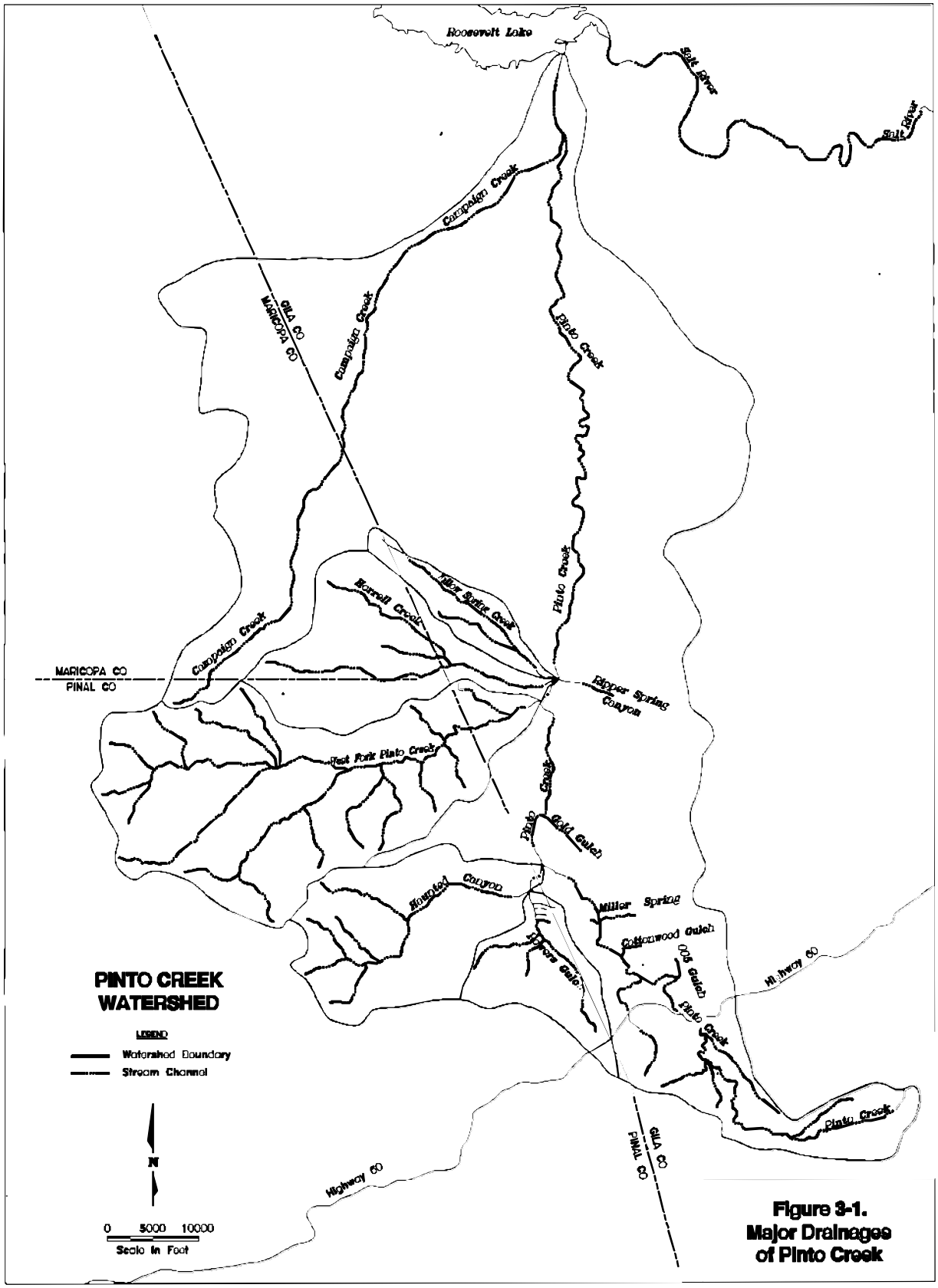

Figure 3-1.
Major Drainages
of Pinto Creek

Table 4-1. Tributary Drainage Areas

Tributary Drainage	Contributing Area (sq. mi.)
Upper Pinto Creek	15.1
Powers Gulch	5.5
Haunted Canyon	12.3
Pinto Valley	20.1
West Fork of Pinto Creek	27.2
Horrell Creek	11.8
Willow Spring Creek	5.0
Lower Pinto Creek	78.4
Existing Non-Contributing Mining Area	2.8
Total	178.2
Source: USFS (1997)	

Table 5-1. Summary of Significant Small-Volume Historic and Inactive Mining Operations in the Pinto Creek Watershed

Mine	Commodity	Period of Operation & Production	Workings & Other Facilities	Present Status	Comments	Data Sources
Gibson	Copper	1906-1920 12 million lbs Cu. 1928-1929 125-160 tpd ore. 1939-1945 Unknown. 1965-1992 (intermittent) Unknown.	3 adits, 2 shafts with cross-cuts Mill Flotation concentrator Precipitation launders Leach pads and ponds Waste rock dumps	Adits open; shafts and cross-cuts are collapsed; concrete mill foundation remains; barren and pregnant leach solution ponds have liners; copper sulfate precipitate coats pregnant pond liner; launders and pvc piping mostly intact; area is unvegetated; some runon control measures installed.	Disseminated and vein mineralization in Pinal Schist. Waste piles produced in 1906-1918 estimated to contain 150,000 tons at 0.7% Cu as sulfide and oxide ore. Water drains from adits to Mineral Creek watershed. Situated on tributary drainage to Pinto Creek. Heavy precipitation in fall 1990 and winter 1992-1993 caused overflow of abandoned leach solution ponds and discharge of copper into Pinto Creek.	2, 3, 4, 5
Swede	Unknown, Possibly Molybdenum	Unknown. Unknown.	1 adit, 2 shafts Waste rock dump	Adit partly open, condition of shafts unknown; waste rock dump mostly overgrown with native vegetation.	Quartz vein in Schultze Granite. Dump contains minor sulfide minerals including pyrite. Situated in steep terrain in the Powers Gulch headwaters. Adit may occasionally contain water.	2, 3
Yo Tambien	Copper	Unknown. Unknown.	2 adits Waste rock dump	Adits collapsed; area has been recontoured to collect seepage from adits.	Vein in Schultze Granite. Situated within 200 m of Pinto Creek.	3
Cactus (Hamilton and Pinto shafts)	Copper	Intermittent from 1908 to 1929. Unknown.	2 shafts with cross-cuts on several levels	Shafts collapsed.	Pervasively oxidized and mineralized Pinal Schist breccia. Area bisected by Pinto Creek which exposes strongly oxidized, copper-bearing rock.	1, 3

Table 5-1. Summary of Significant Small-Volume Historic and Inactive Mining Operations in the Pinto Creek Watershed

Mine	Commodity	Period of Operation & Production	Workings & Other Facilities	Present Status	Comments	Data Sources
Carlota (incl. Arizona National shaft)	Copper	Explored beginning in 1904; operated from 1941 to 1948. Unknown.	2 shafts with cross-cuts on 2 levels Open cut	Shafts collapsed.	Pervasively oxidized and mineralized Pinal Schist breccia. Area bisected by Pinto Creek which exposes strongly oxidized, copper-bearing rock.	1, 2, 3
Black Bess	Zinc	Unknown (pre-1962). Less than 200 tons of concentrate?	2 shafts Mill/Concentrator Waste rock dumps	Shafts are collapsed; concrete mill foundation remains; dumps are overgrown with native vegetation.	Stockwork quartz vein in altered diabase. Situated 150-200 feet above Powers Gulch.	1, 3
Kelly Claims	Copper, Lead, Zinc	Unknown. Unknown.	3 shafts Waste rock dump	Shafts are partially collapsed; waste rock dumps show evidence of oxidation; dumps are unvegetated.	Silicified vein cross-cuts breccia. At least one shaft contains water at depth. Situated along Powers Gulch.	3
Ghost Claims (Dickinson Tunnel)	Copper, Lead, Zinc	Unknown. Unknown.	3 adits Sulfide ore pile Waste rock dumps	Adits partially collapsed; small sulfide ore pile shows oxidation.	Silicified vein cross-cuts altered diabase. Vein is exposed in Powers Gulch streambed; dumps contain sulfide minerals including pyrite. Adits occasionally contain water.	3

Sources: 1 - Peterson (1962); 2 - USFS (1997); 3 - unpublished EPA site visit, March 1999; 4 - ADEQ, 1991; 5 - E&E, 1993.

Table 7-1. Descriptions of Pinto Creek Sub-Basins

Drainage Sub-Basin Acronym	Description of Sub-Basin
UPAG	**UPPER PINTO ABOVE GIBSON**: Upper Pinto Creek from headwaters to confluence with Gibson Mine tributary. Includes Henderson Ranch mines midway downstream.
GG	**GIBSON GULCH:** Gibson Mine Tributary from headwaters to confluence with Pinto Creek. Includes shafts, waste rock dumps, leach pads and ponds of abandoned Gibson Mine.
UPAC	**UPPER PINTO ABOVE CACTUS:** Pinto Creek from Gibson Mine Tributary to southern Cactus Breccia Formation (proposed Carlota Copper Cactus pit). Includes drainage from abandoned Yo Tambien and Bronx vein mines and discharge from BHP NPDES outfall 005 (draining Cottonwood tailings).
CPA	**CACTUS PIT AREA:** Pinto Creek from southern boundary to northern boundary of proposed Cactus/Carlota Pit. Includes exposed Cactus/Carlota orebody and associated historic workings, and drainage from BHP facilities through Cottonwood Gulch.
UPBC	**UPPER PINTO BELOW CACTUS:** Pinto Creek from northern boundary of Cactus Breccia Formation (proposed Carlota Copper Cactus pit) to the confluence with Haunted Canyon. Includes portion of proposed Carlota Main waste dump, area affected by Oct. 1997 BHP tailings spill, and drainage from BHP facilities through Miller Spring Gulch.
PG	**POWERS GULCH:** Powers Gulch from headwaters to confluence with Haunted Canyon. Includes proposed Carlota leach pads, Eder pits and dumps, historic Kelly adits, Ghost Claims adits, Black Bess and Swede Mines, and Mule Spring.
HC	**HAUNTED CANYON:** Haunted Canyon from headwaters to confluence with Powers Gulch. No mining influences known.
HCAC	**HAUNTED CANYON ABOVE CONFLUENCE:** Haunted Canyon from confluence with Powers Gulch to confluence with Pinto Creek. No mining influences known.
PVBC	**PINTO VALLEY BELOW CONFLUENCE:** Pinto Creek from confluence with Haunted Canyon to Iron Bridge crossing. Includes drainage from BHP facilities through Gold Gulch.

Table 7-1. Descriptions of Pinto Creek Sub-Basins

Drainage Sub-Basin Acronym	Description of Sub-Basin
WFP	**WEST FORK PINTO:** West Fork of Pinto Creek from headwaters to confluence with Pinto Creek. No mining influences known.
HORC	**HORRELL CREEK:** Horrell Creek from headwaters to confluence with Pinto Creek. No mining influences known.
WSC	**WILLOW SPRINGS CREEK:** Willow Springs Creek from headwaters to confluence with Pinto Creek. No mining influences known.
LPV	**LOWER PINTO VALLEY:** Pinto Creek from Iron Bridge crossing to confluence with Willow Springs Creek. Includes drainage from BHP facilities through Eastwater and Ripper Spring Canyons and natural drainage through West Fork of Pinto Creek, Horrell Creek, and Willow Springs Creek.
PVW	**PINTO VALLEY WEIR:** Pinto Creek from Willow Springs Creek confluence to Pinto Valley Weir.

Table 7-2. Summary of Data Sources Compiled for TMDL Analysis of Pinto Creek

Drainage	Data Source	Station Name [1]	Number of Data Points [2]			Period of Record	Comments [3]
			Cu-d	Hard	Flow		
UPAG	ADEQ (Mining & Environmental Consultants, 1993)	**ADEQ-8**	**5**	**6**	**0**	10/1/90 - 7/30/92 (intermittent)	Station has various designations; location is Pinto Creek upstream of Gibson Gulch. Flow data not collected. Cu-diss detected in 5 of 5 samples. **Data used to compute TMDL at TS-1.**
	Envirologic Systems, 1981	**METF-1**	**2**	**2**	**1**	3/3/81 - 7/30/81	Location is Simpson Dam. Cu-diss detected in 0 of 2 samples at MDL of 0.02 mg/L. **Data used for background copper concentration in upper Pinto Creek.**
GG	ADEQ (Mining & Environmental Consultants, 1993) ADEQ, 1995	**ADEQ-7**	**6**	**6**	**1**	10/1/90 - 7/30/92 (intermittent) 3/9/95	Station has various designations; location is Gold Gulch upstream of Pinto Creek. Flow data not collected. Cu-diss detected in 6 of 6 samples. **Data used to compute load contributed from Gibson Mine.**
UPAC	ADEQ (Mining & Environmental Consultants, 1993)	ADEQ-9	5	4	0	10/2/90 - 7/30/92 (intermittent)	Location is Pinto Creek below Gibson Gulch confluence. Cu-diss detected in 5 of 5 samples.
	Envirologic Systems, 1981; 1983; ADEQ, 1992, STORET	USFS-70	9	16	7	1/16/74 - 3/5/75 1/24/81 - 3/4/82 5/13/92	Station has various designations; location is Old Highway 60 bridge. Cu-tot measured for 13 samples. Cu-diss detected in 6 of 9 samples at MDL of 0.02 mg/L.
	Magma Copper, 1993; BHP Copper, 1995; 1996; 1997; 1999b	**BHP 005**	**14**	**15**	**14**	1/22/93 - 11/12/96 (quarterly)	Also have summary data for 20 samples from 11/1/93 to 12/31/98. Cu-diss detected in 2 of 14 samples at MDL of 0.02 mg/L. **Data used to compute present load from BHP NPDES outfall 005.**
	BHP Copper, 1998	**AMP-2**	**14**	**13**	**17**	1/11/94 - 10/7/97 (intermittent)	Location is Pinto Creek upstream of proposed Cactus/Carlota pit. Cu-diss detected in 12 of 14 samples at MDL of 0.02 mg/L. **Data used to compute TMDL at TS-3.**

Table 7-2. Summary of Data Sources Compiled for TMDL Analysis of Pinto Creek

Drainage	Data Source	Station Name [1]	Number of Data Points [2]			Period of Record	Comments [3]
			Cu-d	Hard	Flow		
CPA	STORET	USFS-65	0	20	20	12/4/74 - 4/6/77 (intermittent)	Location is Carlota Crossing. Cu-tot reported for 20 samples.
	Magma Copper, 1993; Hargis & Assoc., 1993	PCCX	44	41	0	1/8/93 - 2/28/93 (daily)	Location is Cactus Crossing. Data collected during 1993 upset at Pinto Valley Mine. Cu-diss detected in 44 of 44 samples.
	Groundwater Resources Consultants, 1999b	AMW-12	15	15	---	7/2/93 - 4/22/98 (quarterly)	Alluvial ground water in Cottonwood Gulch downstream of Cottonwood weir.
	BHP Copper, 1998; BHP Copper, 1999a	**AMP-3**	**52**	**52**	**44**	7/9/93 - 7/8/98 (bimonthly to daily)	Location is Pinto Creek below proposed Cactus/Carlota pit. Combines stations AMP-3, AMP-3IS, and AMP-3UP. Cu-diss detected in 50 of 52 samples; MDL varies from 0.02 to 0.05 mg/L. **Data used to compute TMDL at TS-4.**
UPBC	BHP Copper, 1995; 1996; 1997; 1999b	**MG1-1b**	**18**	**18**	**18**	11/29/93 - 11/12/96 (quarterly)	Cu-diss detected in 1 of 13 samples at MDL of 0.01 to 0.02 mg/L. **Data used to compute load contributed by BHP Miller Spring Gulch.**
	STORET	n.a.	0	1	0	11/23/93	Single sample from above Miller Springs reports total copper. Also listed on STORET is a single sample reporting total copper from Miller Spring above mouth on 4/25/75.
	BHP Copper, 1999a; Carlota Copper (GWRC, 1999a)	**PC-5**	**45**	**44**	**41**	6/30/93 - 7/7/98 (semi-annually to weekly)	Location is Pinto Creek above Haunted Canyon confluence. Cu-diss detected in 11 of 44 samples; MDL varies from 0.004 to 2.0 mg/L. **Data used to compute TMDL at TS-5.**

Table 7-2. Summary of Data Sources Compiled for TMDL Analysis of Pinto Creek

Drainage	Data Source	Station Name [1]	Number of Data Points [2]			Period of Record	Comments [3]
			Cu-d	Hard	Flow		
PG	Groundwater Resources Consultants, 1998	AMW-17	19	19	---	7/24/93 - 4/21/98 (quarterly)	Alluvial ground water in headwaters of Powers Gulch. Cu-diss detected in 2 of 19 samples; MDL varies from 0.02 to 2.0 mg/L.
	Carlota Copper (GWRC, 1999a)	PG-Spring	3	4	59	4/27/93 - 7/23/98 (monthly)	Samples collected from Mule Spring. Cu-diss detected in 1 of 3 samples; MDL varies from 0.001 to 0.1 mg/L.
	Carlota Copper (GWRC, 1999a)	**PG-4**	**4**	**4**	**57**	5/6/93 - 7/24/98 (intermittent)	Location is Powers Gulch above Haunted Canyon. Cu-diss detected in 0 of 4 samples; MDL varies from 0.02 to 2.0 mg/L. Flow measured on 12 of 57 dates. **Data used to compute background copper concentration in Powers Gulch and other streams draining from the east.**
HC	No Data	n.a.	0	0	0		Used values for sub-basin PG.
HCAC	Carlota Copper (GWRC, 1999)	**HC-2**	**4**	**4**	**62**	4/23/93 - 7/24/98 (intermittent)	Location is Haunted Canyon below Powers Gulch confluence. Cu-diss detected in 1 of 4 samples; MDL varies from 0.02 to 0.5 mg/L. Flow measured on 62 of 62 dates. **Data used to determine copper contribution from Powers Gulch and Haunted Canyon.**
	Groundwater Resources Consultants, 1998.	AMW-21	18	18	---	8/26/93 - 4/22/98 (quarterly)	Alluvial ground water from Haunted Canyon upstream of Pinto Creek confluence. Cu-diss detected in 0 of 18 samples; MDL varies from 0.02 to 2.0 mg/L.
PVBC	Magma Copper, 1993; BHP Copper, 1995; 1996; 1997; 1999b	**MG1-12b**	**33**	**33**	**33**	1/19/93 - 11/12/96 (daily from 1/19/93 to 2/12/93; quarterly thereafter)	Samples from Gold Gulch Weir collected during and after 1993 upset. Cu-diss detected in 21 of 21 samples during 1993 upset; in 5 of 12 samples after 12/1/93 at MDL of 0.01 to 0.02 mg/L. Also have summary of 18 samples from 11/1/93 to 12/31/98. **Data used to compute copper contribution from BHP Gold Gulch.**
	STORET	n.a.	0	32	28	1/9/74 - 3/8/77 (semi-monthly to monthly with gaps)	Samples from Gold Gulch at Pinto Creek confluence. Cu-total detected in 26 of 33 samples at MDL of 0.05 mg/L.

Table 7-2. Summary of Data Sources Compiled for TMDL Analysis of Pinto Creek

Drainage	Data Source	Station Name [1]	Number of Data Points [2]			Period of Record	Comments [3]
			Cu-d	Hard	Flow		
	STORET	n.a.	0	39	36	1/9/74 - 8/4/77 (semi-monthly to monthly with gaps)	Samples from Pinto Creek below Iron Bridge. Cu-total detected in 12 of 41 samples at MDL of 0.05 mg/L.
	BHP Copper, 1999b	**MG2-18b**	**10**	**10**	**20**	11/1/93 - 12/31/98 (unknown)	Summary data only from North Ripper Spring Canyon. **Data used to compute copper contribution from BHP North Ripper Spring.**
	BHP Copper, 1999	**MG3-23b**	**6**	**6**	**19**	11/1/93 - 12/31/98 (unknown)	Summary data only from South Ripper Spring Canyon. **Data used to compute copper contribution from BHP South Ripper Spring.**
	BHP Copper, 1998; BHP Copper, 1999a	AMP-4	63	63	63	7/9/93 - 7/8/98 (daily to quarterly)	Location is Pinto Creek downstream of Iron Bridge. Combines stations AMP-4 and AMP-4IS. Cu-diss detected in 42 of 63 samples; MDL varies from 0.004 to 0.02 mg/L. Data used during preliminary loading analysis.
WFP	Mineral Extraction Task Force (Envirologic Systems, 1981, 1983)	WFP	1	1	5	1/23/81 - 12/2/81 (bimonthly)	Location is West Fork of Pinto Creek above Pinto Creek. Cu-diss detected in 0 of 1 samples at MDL of 0.02 mg/L. Flow measured from 1/81 to 12/81 on 1 of 5 dates. Data used to determine copper contribution from this watershed.
HORC	No Data	n.a.	0	0	0		Used values for sub-basin WFP.
WSC	No Data	n.a.	0	0	0		Used values for sub-basin WFP.
LPV	Carlota Copper (GWRC, 1998)	PC-8	2	2	59	4/28/93 - 7/23/98 (monthly)	Location is Pinto Creek above West Fork confluence. Cu-diss detected in 1 of 2 samples at MDL of 0.02 mg/L. Flow measured on 34 of 59 dates. Data used during preliminary loading analysis.
PVW	BHP Copper, 1998a; BHP Copper, 1999a	**PV Weir**	**63**	**63**	**48**	6/30/93 - 7/7/98 (daily to quarterly)	Location is Pinto Valley Weir. Cu-diss detected in 12 of 63 samples; MDL varies from 0.004 to 0.1 mg/L. **Data used to compute TMDL at TS-9.**

Table 7-2. Summary of Data Sources Compiled for TMDL Analysis of Pinto Creek

Drainage	Data Source	Station Name [1]	Number of Data Points [2]			Period of Record	Comments [3]
			Cu-d	Hard	Flow		

[1] Stations designated with bold typeface were used in TMDL analysis.
[2] Values designated with bold typeface were used in TMDL analysis. Cu-d = dissolved copper; Hard = hardness.
[3] Bold typeface designates data used in TMDL analysis. Cu-diss = dissolved copper; Cu-total = total recoverable copper.

Note: Data for several other sites were evaluated but not compiled as part of the TMDL analysis. They include BHP/Magma Copper stations AMP-1, BHP upper catchment upset, Tule Tank upset, PV002 upset, PV002A upset, Canyon Toe seep upset, Cottonwood weir upset, tailings erosion flow upset, Pinto Creek Henderson Ranch crossing, Iron Bridge upset; STORET station Pinto Creek at concrete culvert; GWRC stations PC-1, PC-2, PC-3, PC-4, PC-6, PC-7, PC-7.5, PC-10, PG-1, PG-2, PG-3, HC-1, and HC-3; U.S. Forest Service station 50; ADEQ Copper Mining Initiative stations 1, 2, 3, and 4; Mineral Extraction Task Force stations METF 3, 4, 5, and 7; Harding & Associates stations H&A 1, 2, 3, 4, 6, 7, 8, 9, 10, and 11.

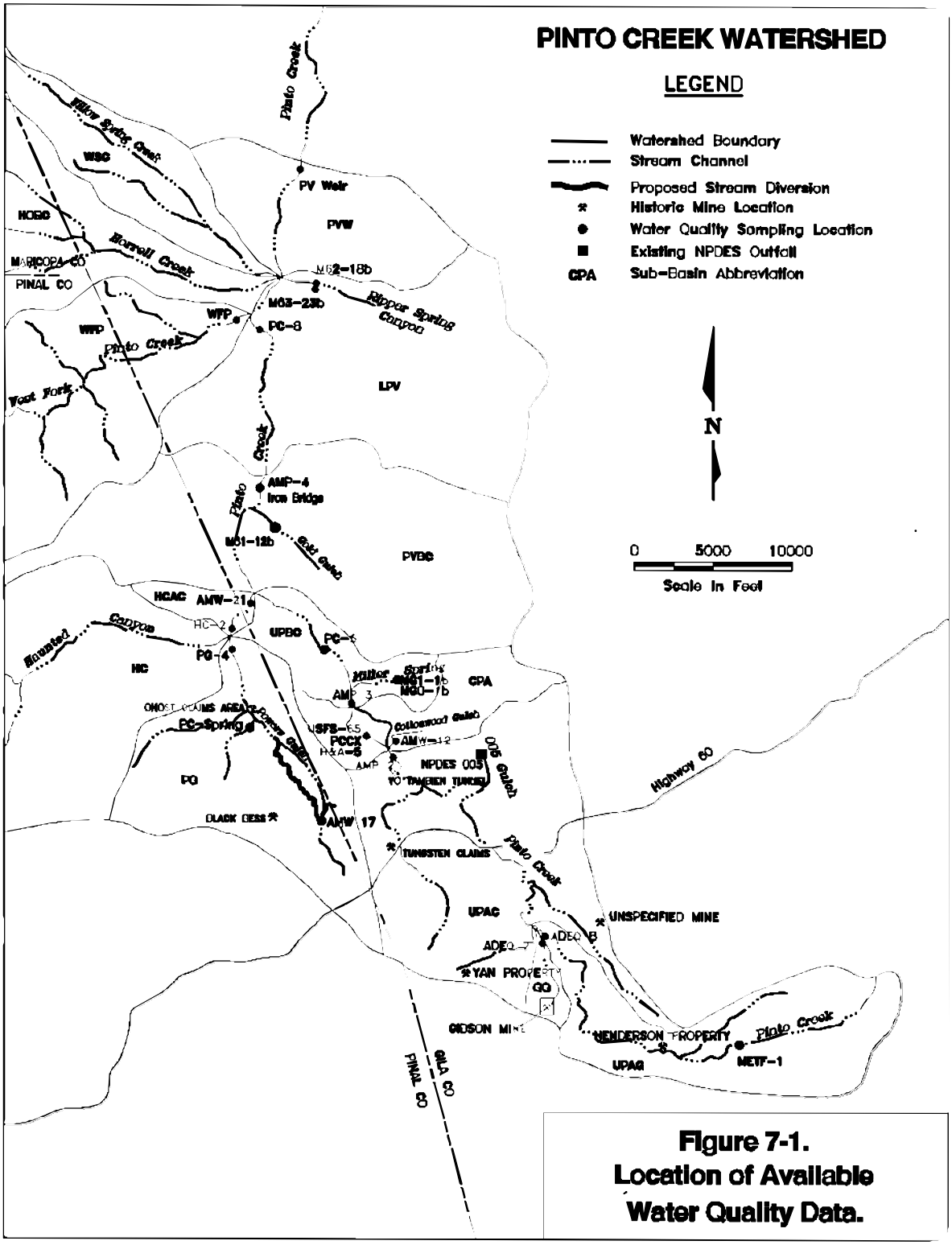

Figure 7-1.
Location of Available Water Quality Data.

Table 8-1. Target Sites for Allocation of Loading Capacity

Target Site (TS) Designation	Description of Location
TS-1	Pinto Creek immediately above the confluence with the Gibson Mine tributary
TS-2	Pinto Creek immediately below the confluence with the Gibson Mine tributary
TS-3	Pinto Creek above the Cactus Breccia Formation; Location of BHP monitoring site AMP-2.
TS-4	Pinto Creek below the Cactus Breccia Formation; Location of BHP monitoring site AMP-3.
TS-5	Pinto Creek immediately above the confluence with Haunted Canyon**;** Location of current BHP monitoring location.
TS-6	Powers Gulch immediately above the confluence with Haunted Canyon**;** Location of current BHP monitoring location PG-4.
TS-7	Haunted Canyon immediately above the confluence with Pinto Creek.
TS-8	Pinto Creek immediately below the confluence with Haunted Canyon.
TS-9	Pinto Creek at the Pinto Valley Weir.

Table 8-2. Sources of Uncertainty and Implicit MOS Provisions

Source of Uncertainty	Implicit MOS Provisions (assumptions)
Rainfall-runoff events are sporadic, sometimes geographically isolated, and difficult to characterize	- Set TMDL for all possible flow levels instead of selecting a single critical flow. - Set TMDLs at 9 target sites throughout basin instead of single site at bottom of impaired reach. - Assume worst case precipitation/loading scenario of precipitation throughout watershed. - Apply more stringent Pinto Creek copper standard to calculate TMDLs for Powers Gulch tributary instead of less stringent Powers Gulch standard.
Duration of loadings and flows following storms are poorly understood.	- Set TMDLs based on more stringent chronic standards for all flow regimes instead of less stringent acute standards which apply to flows of shorter duration. - Set TMDL for all possible flow levels instead of selecting a single critical flow.
There may be unidentified sources which the TMDL does not take into account.	- Specific LA set for suspected but uncharacterized mining sources between TS-2 and TS-3. - TMDL includes unallocated reserve loading capacity amounts at target sites TS-5 and TS-6 to account for potential sites in those areas. - Explicit MOS designed in part to address potentially unidentified sources.
Known loading sources may be underestimated.	- TMDLs and allocations based on worst case loading scenarios for each identified source. Generally used highest observed data value for copper concentrations and flows for each site to calculate allocations.
Available data are limited in quantity and quality.	- All available data were used for the TMDL. - Flow data were supplemented by development of HEC-1 model to provide flow estimates throughout the basis for a wide range of storm sizes. - Explicit MOS designed in part to address data uncertainty.

Source of Uncertainty	Implicit MOS Provisions (assumptions)
Appropriate hardness level to be used to calculate TMDLs is uncertain.	-TMDL is based on a relatively conservative level consistent with State WQS provisions and which is 40% lower than measured mean hardness levels in the basin.
Pinto Creek is a large basin, and localized loading effects may be poorly understood.	- TMDL analysis subdivided basin into 14 subbasins to assist in doing smaller scale data compilation and analysis. - TMDLs and allocations were set for 9 target sites located throughout the impaired reaches of the basin instead of relying on single TMDLs for a single compliance point.
The level and effects of particulate copper in Pinto Creek are poorly understood.	- No evidence was found or provided which indicated that large amounts of copper remain in Creek sediments. - TMDL and allocations focus on more bioavailable and environmentally harmful dissolved copper fraction. - Explicit MOS designed in part to address data uncertainty.

Table 8-3. Arizona Water Quality Criteria for Copper in Pinto Creek

Designated Use Classification	Hardness-Dependent Criteria for Dissolved Copper (:g/L)
	Criterion at Hardness of 400 mg/L
A&Ww-acute	65.4
A&Ww-chronic	38.7

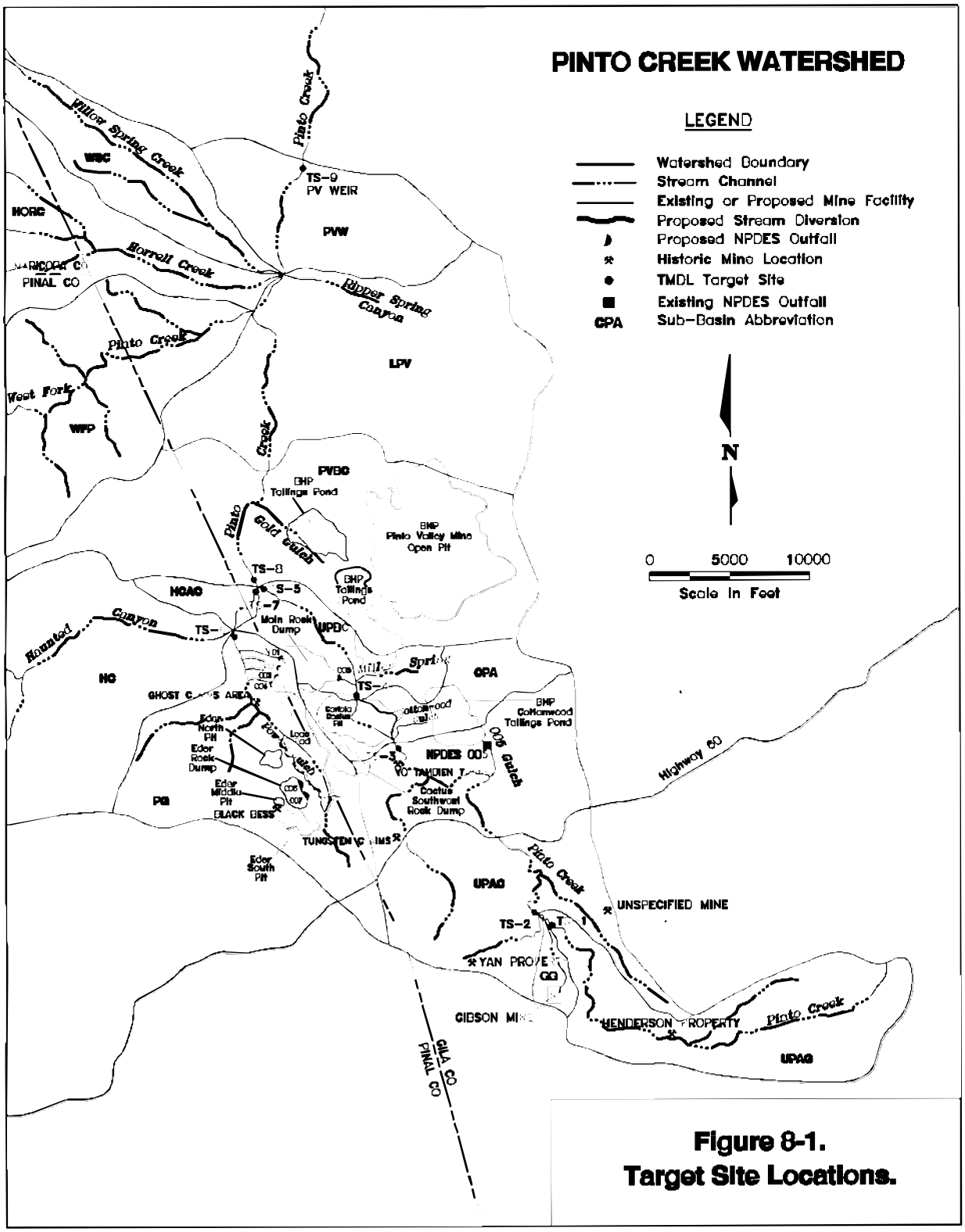

Figure 8-1.
Target Site Locations.

Table 9-1. Proposed Carlota Main Waste Rock Dump - Estimated Discharge Composition

Dump Composition		Maximum MWMT Value (mg/L) [1]		Average MWMT Value (mg/L) [2]	
Rock Unit	**Percentage of Waste Tons**	**MWMT Cu**	**Weighted Cu Contribution [4]**	**MWMT Cu**	**Weighted Cu Contribution [4]**
Pinal Schist	0.182	0.02	0.004	0.02	0.004
Diabase	0.099	0.10	0.010	0.055	0.005
Oxide Breccia	0.420	0.03	0.013	0.01	0.004
Mixed Breccia	0.052	0.02	0.001	0.01	0.001
Apache Leap Dacite	0.236	0.03	0.007	0.005	0.001
Gila Conglomerate	0.003	0.01	0.000	0.01	0.000
Limestone [3]	0.002	0.044	0.000	0.044	0.000
Schultze Granite [3]	0.008	0.044	0.000	0.044	0.000
Total	1.002		0.035		0.015

[1] Maximum MWMT value for rock type regardless of waste rock dump.
[2] Average MWMT value for rock type as determined on samples from the proposed dump lithologies.
[3] Rock type not tested. MWMT value represents 95 percentile Cu value for all tested samples.
Data from Knight Piesold (1993).
[4] Weighting is based on the percentage of each rock type that would be disposed of in the facility.

Table 9-2. Eder Waste Rock Dump - Estimated Discharge Composition

Dump Composition		Maximum MWMT Value (mg/L) [1]		Average MWMT Value (mg/L) [2]	
Rock Unit	**Percentage of Waste Tons**	**MWMT Cu**	**Weighted Cu Contribution [4]**	**MWMT Cu**	**Weighted Cu Contribution [4]**
Pinal Schist	0.458	0.02	0.009	0.005	0.002
Diabase	0.0	0.10	0.000	---	0.000
Oxide Breccia	0.047	0.03	0.001	0.03	0.001
Mixed Breccia	0.0	0.02	0.000	---	0.000
Apache Leap Dacite	0.481	0.03	0.014	0.0175	0.008
Gila Conglomerate	0.0	0.01	0.000	---	0.000
Limestone [3]	0.0	0.044	0.000	---	0.000
Schultze Granite [3]	0.014	0.044	0.001	0.044	0.001
Total	1.000		0.026		0.013

[1] Maximum MWMT value for rock type regardless of waste rock dump.
[2] Average MWMT value for rock type as determined on samples from the proposed dump lithologies.
[3] Rock type not tested. MWMT value represents 95 percentile Cu value for all tested samples.
[4] Weighting is based on the percentage of each rock type that would be disposed of in the facility.

APPENDIX B

SUMMARY OF AVAILABLE WATER QUALITY DATA

Table B-1. Summary of Water Quality Data Associated with Target Site TS-1

Reach UPAG - Upper Pinto Creek, Headwaters to Gibson Mine Tributary									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
Mineral Extraction Task Force (Envirologic Systems, 1981)	Cu - total (mg/L)	3/3/81 - 7/30/81	METF-1 (Simpson Dam)	<0.02					1
Mineral Extraction Task Force (Envirologic Systems, 1981)	Cu - dissolved (mg/L)	3/3/81 - 7/30/81	METF-1 (Simpson Dam)	<0.02	N/R	N/R	<0.02	<0.02	2
Mineral Extraction Task Force (Envirologic Systems, 1981)	Hardness - total, calc (mg/L) [1]	3/3/81 - 7/30/81	METF-1 (Simpson Dam)	300	N/R	N/R	282	318	2
Mineral Extraction Task Force (Envirologic Systems, 1981)	Flow (cfs)	3/3/81 - 7/30/81	METF-1 (Simpson Dam)	N/M					0
ADEQ (Mining & Environmental Consultants, 1993)	Cu - total (mg/L)	10/1/90 - 7/30/92 (intermittent)	Pinto Creek Above Gibson Mine Tributary	0.054	0.044	0.038	0.017	<0.10	6
ADEQ (Mining & Environmental Consultants, 1993)	Cu - dissolved (mg/L)	10/1/90 - 7/30/92 (intermittent)	Pinto Creek Above Gibson Mine Tributary	0.025	0.026	0.009	0.012	0.035	5
ADEQ (Mining & Environmental Consultants, 1993)	Hardness - total (mg/L) [1]	10/1/90 - 7/30/92 (intermittent)	Pinto Creek Above Gibson Mine Tributary	169	155	64	110	290	6
ADEQ (Mining & Environmental Consultants, 1993)	Hardness - calc. (mg/L) [3]	10/1/90 - 7/30/92 (intermittent)	Pinto Creek Above Gibson Mine Tributary	167	154	61	102	276	6

Table B-1. Summary of Water Quality Data Associated with Target Site TS-1

Reach UPAG - Upper Pinto Creek, Headwaters to Gibson Mine Tributary									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
ADEQ (Mining & Environmental Consultants, 1993)	Flow (cfs)	10/1/90 - 7/30/92 (intermittent)	Pinto Creek Above Gibson Mine Tributary	N/M					0

[1] Hardness not specified; assumed total.
[2] For non-detected values, computed using ½ method detection limit (MDL).
[3] Hardness computed from Ca and Mg analyses.
N/M = not measured
N/R = not reported

Table B-2. Summary of Water Quality Data Associated with Target Site TS-2

Reach GG - Gibson Mine Tributary									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
ADEQ (Mining & Environmental Consultants, 1993)	Cu - total (mg/L)	10/1/90 - 7/30/92 (intermittent)	Gibson Mine Tributary	67.3	11.7	101	2.92	249	6
ADEQ (Mining & Environmental Consultants, 1993)	Cu - dissolved (mg/L)	10/1/90 - 7/30/92 (intermittent)	Gibson Mine Tributary	76.1	17.6	102	3.34	236	5
ADEQ (Mining & Environmental Consultants, 1993)	Hardness - total (mg/L) [1]	10/1/90 - 7/30/92 (intermittent)	Gibson Mine Tributary	176	169	47	117	244	5
ADEQ Mining & Environmental Consultants, 1993)	Hardness - calc. (mg/L) [2]	10/1/90 - 7/30/92 (intermittent)	Gibson Mine Tributary	148	157	39	89	192	5
ADEQ (Mining & Environmental Consultants, 1993)	Flow (cfs)	10/1/90 - 7/30/92 (intermittent)	Gibson Mine Tributary	N/M					0
ADEQ, 1995	Cu - total (mg/L)	3/9/95	Gibson Mine Tributary	2.24					1
ADEQ, 1995	Cu - dissolved (mg/L)	3/9/95	Gibson Mine Tributary	1.82					1
ADEQ, 1995	Hardness - total (mg/L) [1]	3/9/95	Gibson Mine Tributary	68					1
ADEQ, 1995	Flow (cfs)	3/9/95	Gibson Mine Tributary	0.383					1

[1] Hardness not specified; assumed total.
[2] Hardness computed from Ca and Mg analyses.
N/M = not measured
N/R = not reported

Table B-3. Summary of Water Quality Data Associated with Target Site TS-3

Reach UPAC - Pinto Creek - From Gibson Mine Tributary to Proposed Carlota Pit									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
US Forest Service - STORET ADEQ, 1991 Mineral Extraction Task Force (Envirologic Systems, 1981)	Cu - total (mg/L) [2]	1/16/74 - 5/13/92	USFS-70 METF-2 ADEQ-10 (Old Hwy. 60 Bridge)	0.14	<0.05	0.20	0.04	0.65	13
US Forest Service - STORET ADEQ, 1991 Mineral Extraction Task Force (Envirologic Systems, 1981)	Cu - dissolved (mg/L) [2]	10/1/90 - 7/30/92 (intermittent)	METF-2 ADEQ-10 (Old Hwy. 60 Bridge)	0.11	0.07	0.15	<0.02	0.49	9
US Forest Service - STORET ADEQ, 1991 Mineral Extraction Task Force (Envirologic Systems, 1981)	Hardness - total (mg/L) [1]	10/1/90 - 7/30/92 (intermittent)	USFS-70 METF-2 ADEQ-10 (Old Hwy. 60 Bridge)	195.3	223	90.8	54	420	16
US Forest Service - STORET ADEQ, 1991 Mineral Extraction Task Force (Envirologic Systems, 1981)	Flow (cfs)	10/1/90 - 7/30/92 (intermittent)	METF-2 ADEQ-10 (Old Hwy. 60 Bridge)	0.3986	0.1236	0.737	0.002	2.048	7
BHP Copper, Inc. (Annual NPDES reports, 1994-1996)	Cu - dissolved (mg/L) [2]	1/22/93 - 11/12/96	BHP NPDES 005	0.013	<0.010	0.005	0.006	<0.02	15
BHP Copper, Inc. (Annual NPDES reports, 1994-1996)	Hardness - total (mg/L)	1/22/93 - 11/12/96	BHP NPDES 005	872	933	641	202	1480	3
BHP Copper, Inc. (Annual NPDES reports, 1994-1996)	Hardness - dissolved (mg/L)	1/22/93 - 11/12/96	BHP NPDES 005	1096	1160	328	177	1450	12

Table B-3. Summary of Water Quality Data Associated with Target Site TS-3

Reach UPAC - Pinto Creek - From Gibson Mine Tributary to Proposed Carlota Pit									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
BHP Copper, Inc. (Annual NPDES reports, 1994-1996)	Flow (cfs)	1/22/93 -11/12/96	BHP NPDES 005	0.0544	0.0306	0.083	0.007	0.3342	14
BHP Copper, Inc. (BHP, 1998a)	Cu - dissolved (mg/L) [2]	1/11/94 - 10/7/97	BHP AMP-2	0.035	0.026	0.024	0.015	0.110	14
BHP Copper, Inc. (BHP, 1998a)	Hardness - dissolved (mg/L)	1/11/94 - 10/7/97	BHP AMP-2	296	251	151	91	560	13
BHP Copper, Inc. (BHP, 1998a)	Flow (cfs)	1/11/94 - 10/7/97	BHP AMP-2	0.34	0.04	0.80	0.00	3.12	17

[1] Hardness not specified; assumed total.
[2] For non-detected values, computed using method detection limit (MDL).
N/M = not measured
N/R = not reported

Table B-4. Summary of Water Quality Data Associated with Target Site TS-4

Reach CPA - Proposed Carlota Copper Cactus Pit Area (Cactus Breccia Formation)									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
US Forest Service - STORET	Cu - total (mg/L) [1]	12/4/74 - 4/6/77	USFS-65 (Cactus Crossing)	<0.06	<0.05	0.013	<0.05	0.10	20
US Forest Service - STORET	Cu - dissolved (mg/L) [1]	12/4/74 - 4/6/77	USFS-65 (Cactus Crossing)	N/M					
US Forest Service - STORET	Hardness - total (mg/L)	12/4/74 - 4/6/77	USFS-65 (Cactus Crossing)	318	284	186	80	710	20
US Forest Service - STORET	Flow (cfs) [2]	12/4/74 - 4/6/77	USFS-65 (Cactus Crossing)	2.6	1.0	2.5	0.1	7.0	20
BHP Copper, Inc. (BHP 1993 Upset Report No. 3) and (Hargis & Assoc. 1993)	Cu - total (mg/L) [1]	1/8/93 - 2/28/93	PCCX H&A 5 (Cactus Crossing)	0.184	0.161	0.171	0.034	0.103	44
BHP Copper, Inc. (BHP 1993 Upset Report No. 3) and (Hargis & Assoc. 1993)	Cu - dissolved (mg/L) [1]	1/8/93 - 2/28/93	PCCX H&A 5 (Cactus Crossing)	0.098	0.102	0.034	0.034	0.159	44
BHP Copper, Inc. (BHP 1993 Upset Report No. 3) and (Hargis & Assoc. 1993)	Hardness - total (mg/L) [3]	1/8/93 - 2/28/93	PCCX H&A 5 (Cactus Crossing)	71	59	34.2	19	140	41
BHP Copper, Inc. (BHP 1993 Upset Report No. 3) and (Hargis & Assoc. 1993)	Flow (cfs)	1/8/93 - 2/28/93	PCCX H&A 5 (Cactus Crossing)	N/M					

Table B-4. Summary of Water Quality Data Associated with Target Site TS-4

Reach CPA - Proposed Carlota Copper Cactus Pit Area (Cactus Breccia Formation)									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Cu - total (mg/L) [1]	7/9/93 - 7/8/98	BHP AMP 3 AMP 3IS AMP 3UP	N/M					
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Cu - dissolved (mg/L) [1]	7/9/93 - 7/8/98	AMP 3 AMP 3IS AMP 3UP	0.050	0.044	0.026	0.015	0.141	52
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Hardness - total (mg/L)	7/9/93 - 7/8/98	AMP 3 AMP 3IS AMP 3UP	356	346	204	58.8	936	43
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Hardness - dissolved (mg/L)	7/9/93 - 7/8/98	AMP 3 AMP 3IS AMP 3UP	368	312	179	109	710	9
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Flow (cfs)	7/9/93 - 7/8/98	AMP 3 AMP 3IS AMP 3UP	3.84	0.123	11.91	0.000	66.84	44

[1] For non-detected values, computed using method detection limit (MDL)
[2] Flow values are estimated
[3] Hardness not specified; assumed total
N/M = not measured
N/R = not reported

Table B-5. Summary of Water Quality Data Associated with Target Site TS-5

Reach UPBC -Pinto Creek Above Confluence with Haunted Canyon									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
BHP Copper, Inc. (BHP, 1999b)	Cu - total (mg/L)	11/1/93 - 12/31/98	MG1-1b MGO-1b (Miller Spring Gulch)	N/R					

Table B-5. Summary of Water Quality Data Associated with Target Site TS-5

Reach UPBC -Pinto Creek Above Confluence with Haunted Canyon									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
BHP Copper, Inc. (BHP, 1999b)	Cu - dissolved (mg/L) [1]	11/1/93 - 12/31/98	MG1-1b MGO-1b (Miller Spring Gulch)	0.0093	N/R	0.006	0.009	0.033	18
BHP Copper, Inc. (BHP, 1999b)	Hardness - total (mg/L)	11/1/93 - 12/31/98	MG1-1b MGO-1b (Miller Spring Gulch)	1600					1
BHP Copper, Inc. (BHP, 1999b)	Hardness - dissolved (mg/L)	11/1/93 - 12/31/98	MG1-1b MGO-1b (Miller Spring Gulch)	1558	N/R	225	1190	2100	18
BHP Copper, Inc. (BHP, 1999b)	Flow (cfs)	11/1/93 - 12/31/98	MG1-1b MGO-1b (Miller Spring Gulch)	0.0466	N/R	0.026	0.019	0.111	18
Carlota Copper Company (Ground Water Resource Consultants, 1999a) BHP Copper, Inc. (BHP, 1999a)	Cu - total (mg/L) [1]	6/30/93 - 7/7/98	PC-5	0.133	0.005	0.439	<0.004	<2.0	45
Carlota Copper Company (Ground Water Resource Consultants, 1999a) BHP Copper, Inc. (BHP, 1999a)	Cu - dissolved (mg/L) [1]	6/30/93 - 7/7/98	PC-5	0.130	<0.004	0.440	<0.004	<2.0	45

Table B-5. Summary of Water Quality Data Associated with Target Site TS-5

Reach UPBC -Pinto Creek Above Confluence with Haunted Canyon									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
Carlota Copper Company (Ground Water Resource Consultants, 1999a) BHP Copper, Inc. (BHP, 1999a)	Hardness - total (mg/L)	6/30/93 - 7/7/98	PC-5	311	160	350	73.2	1360	44
Carlota Copper Company (Ground Water Resource Consultants, 1999a) BHP Copper, Inc. (BHP, 1999a)	Flow (cfs)	6/30/93 - 7/7/98	PC-5	5.260	0.6506	11.91	0.056	44.56	41

[1] For non-detected values, computed using ½ method detection limit (MDL).
N/M = not measured.
N/R = not reported.

Table B-6. Summary of Water Quality Data Associated with Target Site TS-6

Reach PG -Powers Gulch Above Confluence with Haunted Canyon									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Cu - total (mg/L) [1]	4/27/93 - 7/23/98	PG-Spring (Mule spring)	<0.04	<0.016	<0.05	<0.001	<0.1	3
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Cu - dissolved (mg/L) [1]	4/27/93 - 7/23/98	PG-Spring (Mule spring)	<0.04	<0.02	<0.05	0.003	<0.1	3
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Hardness - total (mg/L) [2]	4/27/93 - 7/23/98	PG-Spring (Mule spring)	79	86	34	31	112	4
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Flow (cfs)	4/27/93 - 7/23/98	PG-Spring (Mule spring)	0.181	0.016	0.018	0.001	0.037	3
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Cu - total (mg/L) [1]	5/6/93 - 7/24/98	PG-4 (Powers Gulch)	<0.52	<0.02	<0.99	<0.02	<2.0	4
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Cu - dissolved (mg/L) [1]	5/6/93 - 7/24/98	PG-4 (Powers Gulch)	<0.52	<0.02	<0.99	<0.02	<2.0	4

Table B-6. Summary of Water Quality Data Associated with Target Site TS-6

Reach PG -Powers Gulch Above Confluence with Haunted Canyon									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Hardness - total (mg/L)[2]	5/6/93 - 7/24/98	PG-4 (Powers Gulch)	101	86	53	58	174	4
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Flow (cfs)	5/6/93 - 7/24/98	PG-4 (Powers Gulch)	0.170	0.000	0.511	0.000	2.35	57

[1] For non-detected values, computed using method detection limit (MDL).
[2] Hardness computed from Ca and Mg analyses.
N/M = not measured
N/R = not reported

Table B-7. Summary of Water Quality Data Associated with Target Site TS-7

Reach HCAC -Haunted Canyon Above Confluence with Pinto Creek									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Cu - total (mg/L) [1]	4/23/93 - 7/24/98	HC-2 (Haunted Canyon)	<0.2	<0.1	<0.2	<0.001	<0.5	4
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Cu - dissolved (mg/L) [1]	4/23/93 - 7/24/98	HC-2 (Haunted Canyon)	<0.2	<0.1	<0.2	0.002	<0.5	4
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Hardness - total (mg/L) [2]	4/23/93 - 7/24/98	HC-2 (Haunted Canyon)	213	217	33	176	243	4
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Flow (cfs)	4/23/93 - 7/24/98	HC-2 (Haunted Canyon)	0.717	0.180	1.336	0.011	7.71	62

[1] For non-detected values, computed using method detection limit (MDL).
[2] Hardness computed from Ca and Mg analyses.
N/M = not measured
N/R = not reported

Table B-8. Summary of Water Quality Data Associated with Target Site TS-8

Reach PVBC -Pinto Creek From Confluence with Haunted Canyon to Iron Bridge Crossing									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
STORET	Cu - total (mg/L)	1/9/74 - 3/8/77	Gold Gulch	0.574	N/R	0.976	<0.01	33	7
STORET	Cu - dissolved (mg/L)	1/9/74 - 3/8/77	Gold Gulch	N/M	N/R				
STORET	Hardness - total (mg/L)	1/9/74 - 3/8/77	Gold Gulch	1615	N/R	317	1024	2260	32
STORET	Flow (cfs)	1/9/74 - 3/8/77	Gold Gulch	0.6	N/R	1.3	0.09	7.0	28
Magma Copper (1993 Upset Report #4)	Cu - total (mg/L) [1]	1/19/93 - 2/12/93 [2]	MG1-12b (Gold Gulch Weir)	N/R					
Magma Copper (1993 Upset Report #4)	Cu - dissolved (mg/L) [1]	1/19/93 - 2/12/93 [2]	MG1-12b (Gold Gulch Weir)	31.0	<0.705	91.0	0.306	340	21
Magma Copper (1993 Upset Report #4)	Hardness - total (mg/L)	1/19/93 - 2/12/93 [2]	MG1-12b (Gold Gulch Weir)	2173	1910	937	1230	5360	21
Magma Copper (1993 Upset Report #4)	Flow (cfs)	1/19/93 - 2/12/93 [2]	MG1-12b (Gold Gulch Weir)	3.973	0.548	15.33	0.163	70.84	21
BHP Copper, Inc. (BHP, 1999b)	Cu - total (mg/L) [3]	11/1/93 -12/31/98 [4]	MG1-12b (Gold Gulch Weir)	N/R					
BHP Copper, Inc. (BHP, 1999b)	Cu - dissolved (mg/L) [3]	11/1/93 -12/31/98 [4]	MG1-12b (Gold Gulch Weir)	0.021	N/R	0.037	0.008	0.17	18

Table B-8. Summary of Water Quality Data Associated with Target Site TS-8

Reach PVBC -Pinto Creek From Confluence with Haunted Canyon to Iron Bridge Crossing									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
BHP Copper, Inc. (BHP, 1999b)	Hardness - total (mg/L)	11/1/93 -12/31/98[4]	MG1-12b (Gold Gulch Weir)	1400	N/R				1
BHP Copper, Inc. (BHP, 1999b)	Hardness - dissolved (mg/L)	11/1/93 -12/31/98[4]	MG1-12b (Gold Gulch Weir)	1584	N/R	176	1340	2000	18
BHP Copper, Inc. (BHP, 1999b)	Flow (cfs)	11/1/93 -12/31/98[4]	MG1-12b (Gold Gulch Weir)	0.0510	N/R	0.047	0.0	0.1559	22
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Cu - total (mg/L)	7/9/93 - 7/8/98	AMP-4	N/R					
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Cu - dissolved (mg/L) [1]	7/9/93 - 7/8/98	AMP-4	0.017	0.011	0.014	<0.004	0.064	63
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Hardness - total (mg/L)	7/9/93 - 7/8/98	AMP-4	627	599	412	97	1170	44
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Hardness - dissolved (mg/L)	7/9/93 - 7/8/98	AMP-4	666	567	392	231	1400	19
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Flow (cfs)	7/9/93 - 7/8/98	AMP-4	6.53	0.33	16.92	0.0	77.99	63
STORET	Cu - total (mg/L)	1/9/74 - 4/6/77	Iron Bridge	0.84	N/R	0.135	<0.01	0.86	41
STORET	Cu - dissolved (mg/L) [1]	1/9/74 - 4/6/77	Iron Bridge	N/M					

Table B-8. Summary of Water Quality Data Associated with Target Site TS-8

Reach PVBC -Pinto Creek From Confluence with Haunted Canyon to Iron Bridge Crossing									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
STORET	Hardness - total (mg/L)	1/9/74 - 4/6/77	Iron Bridge	681	N/R	312	168	1420	39
STORET	Hardness - dissolved (mg/L)	1/9/74 - 4/6/77	Iron Bridge	N/M					
STORET	Flow (cfs)	1/9/74 - 4/6/77	Iron Bridge	3.7	N/R	3.5	0	16	36
Magma Copper (1993 Upset Report #4)	Cu - total [1] (mg/L)	1/8/93-2/28/93 [2]	PC1B Iron Bridge	0.216	0.090	0.308	0.031	1.830	43
Magma Copper (1993 Upset Report #4)	Cu - dissolved (mg/L) [1]	1/8/93-2/28/93 [2]	PC1B Iron Bridge	0.051	0.047	0.021	0.023	0.128	43
Magma Copper (1993 Upset Report #4)	Hardness - total (mg/L) [5]	1/8/93-2/28/93	PC1B Iron Bridge	208	175	142	68.1	930	40
Magma Copper (1993 Upset Report #4)	Hardness - dissolved (mg/L)	1/8/93-2/28/93	PC1B Iron Bridge	N/M					
Magma Copper (1993 Upset Report #4)	Flow (cfs)	1/8/93-2/28/93	PC1B Iron Bridge	N/M					
BHP Copper, Inc. (BHP, 1999b)	Cu - total [3] (mg/L)	11/1/93 - 12/31/98	MG3-23b South Ripper Spring Canyon	0.015	N/R	0.016	<0.01	<0.1	7
BHP Copper, Inc. (BHP, 1999b)	Cu - dissolved (mg/L) [3]	11/1/93 - 12/31/98	MG3-23b South Ripper Spring Canyon	0.015	N/R	0.017	<0.01	0.017	6

Table B-8. Summary of Water Quality Data Associated with Target Site TS-8

Reach PVBC -Pinto Creek From Confluence with Haunted Canyon to Iron Bridge Crossing									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
BHP Copper, Inc. (BHP, 1999b)	Hardness - total (mg/L) [5]	11/1/93 - 12/31/98	MG3-23b South Ripper Spring Canyon	1548	N/R	213	1150	1740	6
BHP Copper, Inc. (BHP, 1999b)	Hardness - dissolved (mg/L)	11/1/93 - 12/31/98	MG3-23b South Ripper Spring Canyon	1500					1
BHP Copper, Inc. (BHP, 1999b)	Flow (cfs)	11/1/93 - 12/31/98	MG3-23b South Ripper Spring Canyon	0.003	N/R	0.004	0.000	0.011	19
BHP Copper, Inc. (BHP, 1999b)	Cu - total [3] (mg/L)	11/1/93 - 12/31/98	MG2-18b North Ripper Spring Canyon	0.007	N/R	0.003	<0.01	<0.02	11
BHP Copper, Inc. (BHP, 1999b)	Cu - dissolved (mg/L) [3]	11/1/93 - 12/31/98	MG2-18b North Ripper Spring Canyon	0.013	N/R	0.014	<0.01	<0.1	10
BHP Copper, Inc. (BHP, 1999b)	Hardness - total (mg/L) [5]	11/1/93 - 12/31/98	MG2-18b North Ripper Spring Canyon	1600					1
BHP Copper, Inc. (BHP, 1999b)	Hardness - dissolved (mg/L)	11/1/93 - 12/31/98	MG2-18b North Ripper Spring Canyon	1475	N/R	496	758	2070	10

Table B-8. Summary of Water Quality Data Associated with Target Site TS-8

Reach PVBC -Pinto Creek From Confluence with Haunted Canyon to Iron Bridge Crossing									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
BHP Copper, Inc. (BHP, 1999b)	Flow (cfs)	11/1/93 - 12/31/98	MG2-18b North Ripper Spring Canyon	0.005	N/R	0.007	0.000	0.022	20

[1] For non-detected values, computed using method detection limit (MDL).
[2] Taken during 1993 reported upset condition.
[3] For non-detected values, computed using ½ method detection limit (MDL).
[4] Taken after 1993 reported upset condition.
[5] Hardness not specified; assumed total.
N/M = not measured
N/R = not reported

Table B-9. Summary of Water Quality Data Associated with Target Site TS-9

Reach PVW - From Iron Bridge Crossing to Pinto Valley Weir									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Cu - total (mg/L) [1]	6/30/93 - 10/27/93	PC-8	0.018	0.018	N/R	<0.016	0.02	2
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Cu - dissolved (mg/L) [1]	6/30/93 - 10/27/93	PC-8	0.02	0.02	N/R	<0.02	0.02	2
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Hardness - total (mg/L) [2]	6/30/93 - 10/27/93	PC-8	422	422	N/R	421	423	2
Carlota Copper Company (Ground Water Resource Consultants, 1999a)	Flow (cfs)	6/30/93 - 10/27/93	PC-8	1.74	0.059	3.91	0	19.39	59
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Cu - total (mg/L) [1]	6/30/93 - 7/7/98	Pinto Valley Weir	N/R					
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Cu - dissolved (mg/L) [1]	6/30/93 - 7/7/98	Pinto Valley Weir	0.013	0.007	0.015	<0.004	<0.10	63
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Hardness - total (mg/L)	6/30/93 - 7/7/98	Pinto Valley Weir	306	337	82	132	431	43
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Hardness - dissolved (mg/L)	6/30/93 - 7/7/98	Pinto Valley Weir	403	400	58	298	520	21
BHP Copper, Inc. (BHP, 1998a) and (BHP, 1999a)	Flow (cfs)	6/30/93 - 7/7/98	Pinto Valley Weir	9.814	0.473	25.84	0.00	122.55	48

Table B-9. Summary of Water Quality Data Associated with Target Site TS-9

Reach PVW - From Iron Bridge Crossing to Pinto Valley Weir									
Data Source	Data Constituent	Period of Record	Station Designations	Mean	Median	Std. Dev.	Min.	Max.	n

[1] For non-detected values, computed using method detection limit (MDL).
[2] Hardness computed from Ca and Mg analyses.
N/M = not measured.
N/R = not reported.

APPENDIX C

SUMMARY OF PROJECTED LOADING CONDITIONS, LOAD ALLOCATIONS, AND WASTE LOAD ALLOCATIONS

Table C-1. TMDL Elements for Dissolved Copper by Target Site

Target Site	Storm Event	Stream Discharge [1] (cfs)	Total Loading Capacity [2] (kg/day)	Background [3] (kg/day)	Previously Allocated Capacity [4] (kg/day)	Net Available Capacity (kg/day)	Margin of Safety[5] (kg/day)	Capacity Available for Allocation (kg/day)
TS-1	< 2-Year, 1-Hour	0-73	Note 6			Note 6		Note 6
	2-Year, 1-Hour	74	7.08	5.88	0.00	1.20	0.12	1.08
	10-Year, 1-Hour	202	19.14	16.01	0.00	3.13	0.31	2.82
	10-Year, 24-Hour	1037	98.31	82.45	0.00	15.86	1.59	14.27
	100-Year, 24-	1740	164.97	138.35	0.00	26.62	2.66	23.96
TS-2	< 2-Year, 1-Hour	0-78	Note 6			Note 6		Note 6
	2-Year, 1-Hour	79	7.48	6.27	0.42	0.79	0.08	0.71
	10-Year, 1-Hour	217	20.48	17.26	1.11	2.11	0.21	
	10-Year, 24-Hour	1109	105.14	88.70	5.72	10.72	1.07	9.65
	100-Year, 24-	1863	176.64	148.14	9.59	18.91	1.89	17.02
TS-3	< 2-Year, 1-Hour	0-234	Note 6			Note 6		Note 6
	2-Year, 1-Hour	235	22.30	18.69	1.20	2.41	0.24	2.17
	10-Year, 1-Hour	610	57.85	48.49	3.32	6.04	0.60	5.44
	10-Year, 24-Hour	2952	279.89	234.72	16.97	28.20	2.82	25.38
	100-Year, 24-	4913	465.82	390.65	28.50	46.67	4.67	42.00
TS-4	< 2-Year, 1-Hour	0-238	Note 6			Note 6		Note 6
	2-Year, 1-Hour	239	22.65	19.01	3.61	1.03	0.003	0.027
	10-Year, 1-Hour	624	59.15	49.63	9.33	0.19	0.02	0.17
	10-Year, 24-Hour	3015	285.87	239.72	45.18	0.97	0.10	0.87
	100-Year, 24-Hour	5021	476.06	399.23	75.21	1.62	0.16	1.46

Table C-1. TMDL Elements for Dissolved Copper by Target Site

Target Site	Storm Event	Stream Discharge [1] (cfs)	Total Loading Capacity [2] (kg/day)	Background [3] (kg/day)	Previously Allocated Capacity [4] (kg/day)	Net Available Capacity (kg/day)	Margin of Safety[5] (kg/day)	Capacity Available for Allocation (kg/day)
TS-5	< 2-Year, 1-Hour	0-259	Note 6			Note 6		Note 6
	2-Year, 1-Hour	260	24.67	20.67	3.61	0.39	0.08	0.31
	10-Year, 1-Hour	683	64.77	54.31	9.36	1.10	0.20	0.90
	10-Year, 24-Hour	3346	317.27	266.05	45.27	5.95	1.19	4.76
	100-Year, 24-	5581	529.17	443.76	75.37	10.04	2.01	8.03
TS-6	< 2-Year, 1-Hour	0-176	Note 6			Note 6		Note 6
	2-Year, 1-Hour	177	16.77	14.07	0.00	2.70	0.54	2.16
	10-Year, 1-Hour	367	34.81	29.19	0.00	5.62	1.12	4.50
	10-Year, 24-Hour	1337	126.78	106.31	0.00	20.47	4.09	16.38
	100-Year, 24-	2106	199.68	167.44	0.00	32.24	6.45	25.79
TS-7	< 2-Year, 1-Hour	0-382	Note 6			Note 6		Note 6
	2-Year, 1-Hour	383	36.30	30.45	0.26	5.59	1.12	4.47
	10-Year, 1-Hour	919	87.13	73.06	0.55	13.52	2.70	10.82
	10-Year, 24-Hour	4086	387.43	324.87	20.48	42.08	8.42	33.66
	100-Year, 24-	6721	637.26	534.40	32.24	70.62	14.12	56.50
TS-8	< 2-Year, 1-Hour	0-639	Note 6			Note 6		Note 6
	2-Year, 1-Hour	640	60.68	51.12	4.49	5.07	1.01	4.06
	10-Year, 1-Hour	1600	151.71	127.37	11.70	12.64	2.53	10.11
	10-Year, 24-Hour	7420	703.53	590.92	70.56	42.05	8.41	33.64
	100-Year, 24-	12,287	1165.00	978.15	124.71	62.14	12.43	49.71

Table C-1. TMDL Elements for Dissolved Copper by Target Site

Target Site	Storm Event	Stream Discharge [1] (cfs)	Total Loading Capacity [2] (kg/day)	Background [3] (kg/day)	Previously Allocated Capacity [4] (kg/day)	Net Available Capacity (kg/day)	Margin of Safety[5] (kg/day)	Capacity Available for Allocation (kg/day)
TS-9	< 2-Year, 1-Hour	0-1914	Note 6			Note 6		Note 6
	2-Year, 1-Hour	1915	181.58	152.49	4.97	24.12	4.82	19.30
	10-Year, 1-Hour	4667	442.52	371.25	12.68	58.59	11.72	46.87
	10-Year, 24-Hour	20,786	1970.83	1653.67	74.75	242.41	48.48	193.93
	100-Year, 24-	34,144	3237.39	2716.03	130.65	390.71	78.14	312.57

[1] Maximum 6-hour Average stream discharge estimated by the HEC-1 Model for the target site.

[2] Loading Capacity is calculated from the Chronic Water Quality Standard using a hardness value of 400 mg/l CaCO3 and the lowest flow associated with the flow tier.

[3] For Target Sites TS-1 through TS-5, background computed from ½ MDL for analyses at station METF-1 (MDL = 0.02 mg/L) = 0.01 mg/L; for Target Sites TS-6 and TS-7, background computed from ½ MDL for analyses at station PG-4 (MDL = 0.02 mg/L) = 0.01 mg/L; for Target Sites TS-8 background computed by summing background loads from TS-7 and from TS-5; for Target Site TS-9, background computed by summing background loads from TS-8 and combining with the computed background load for the reach between TS-8 and TS-9 using the 0.01 mg/L value.

[4] Based on allocations made to sources at upstream target sites; value represents the running sum of previous allocations made for margin of safety, LAs, and WLAs (See Tables C-2 through C-10).

[5] A 10 percent margin of safety (MOS) is provided in the calcuation of the TMDLs and associated allocations for target sites TS-1 through TS-4. A 20% MOS is provided in the calculation of the TMDLs and associated allocations for target sites TS-5 through TS-9. See the Margin of Safety discussion in Section 8.7 for a description of the basis for these margin of safety allowances.

[6] The loading capacity , net available capacity, and capacity available for allocation for the lowest flow tier are articulated on a concentration basis rather than a mass loading basis. The loading capacity and associated capacity available for allocation for this tier are equal to the concentration based water quality standard for chronic and acute exposures to copper. Because these acute and chronic water quality standards are expressed as a function of receiving water hardness, they are expressed here in the same functional form. Specifically, the loading capacity, net available capacity, and capacity available for allocation for the lowest flow tier for each target site equal:

Acute criterion = $e^{(0.9422\ [\ln(\text{hardness})] - 1.464)}$

Chronic criterion = $e^{(0.8545\ [\ln(\text{hardness})] - 1.465)}$

Table C-2. Estimated Projected Loading and Load Allocations for Target Site TS-1
Pinto Creek Immediately Above the Gibson Mine Tributary

Source		Flow Tier							
	Less than 2-Year, 1-Hour Storm 0-73 cfs	2-Year, 1-Hour Storm Event 74 cfs		10-Year, 1-Hour Storm Event 202 cfs		10-Year, 24-Hour Storm Event 1,037 cfs		100-Year, 24-Hour Storm Event 1,740 cfs	
	See note 4	Available Capacity = 0.1.08 kg/day [1]		Available Capacity = 2.82 kg/day [1]		Available Capacity = 14.27 kg/day [1]		Available Capacity = 23.96 kg/day [1]	
	TMDL LA (ug/l)	Projected Loading (kg/day)	TMDL LA [3] (kg/day)	Projected Loading (kg/day)	TMDL LA [3] (kg/day)	Projected Loading (kg/day)	TMDL LA [3] (kg/day)	Projected Loading (kg/day)	TMDL LA [3] (kg/day)
Henderson Ranch Mines [2]	Note 4	4.53	0.29	12.35	0.81	63.43	4.13	106.42	6.92

[1] Value from Table C-1.

[2] Projected load is based on available water quality data and discharge values at TS-1 minus the background load.

[3] The LA established for the Henderson Ranch mine assumes that this source can be remediated to achieve water quality discharges of 0.0105 mg/L or less, which is approximately equal to background conditions (see Section 9.2.1).

[4] The loading capacity is set to equal the water quality standard. The concentration based load allocation for the lowest flow tier is:

Acute criterion = $e^{(0.9422\ [\ln(\text{hardness})] - 1.464)}$

Chronic criterion = $e^{(0.8545\ [\ln(\text{hardness})] - 1.465)}$

Table C-3. Estimated Projected Loading and Load Allocations for Target Site TS-2
Pinto Creek Immediately Below the Confluence with the Gibson Mine Tributary

Source		Flow Tier							
	Less than 2-Year 1-Hour Storm 0-78 cfs	2-Year, 1-Hour Storm Event 79 cfs		10-Year, 1-Hour Storm Event 217 cfs		10-Year, 24-Hour Storm Event 1,109 cfs		100-Year, 24-Hour Storm Event 1,863 cfs	
	See note 3	Available Capacity = 0.71 kg/day [1]		Available Capacity = 1.90 kg/day [1]		Available Capacity = 9.65 kg/day [1]		Available Capacity = 17.02 kg/day [1]	
	TMDL LA (ug/l)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)
Gibson Mine [2]	Note 3	3,464	0.71	9,238	0.1.90	49,652	9.65	83,138	17.02

[1] Value from Table C-1.

[2] Projected load from Gibson Mine computed the using maximum dissolved copper concentration (236 mg/L) (Mining & Environmental Consultants, 1993).

[3] The loading capacity is set to equal the water quality standard. The concentration based load allocation for the lowest flow tier is:

Acute criterion = $e^{(0.9422\ [\ln(\text{hardness})] - 1.464)}$

Chronic criterion = $e^{(0.8545\ [\ln(\text{hardness})] - 1.465)}$

Table C-4. Estimated Projected Loading and Load Allocations for Target Site TS-3
Pinto Creek Above the Cactus Breccia Formation (Proposed Carlota Cactus Pit Area); Site of BHP AMP-2

Source		Flow Tier							
	Less than 2-Year 1-Hour Storm 0-234 cfs	2-Year, 1-Hour Storm Event 235 cfs		10-Year, 1-Hour Storm Event 610 cfs		10-Year, 24-Hour Storm Event 2,952 cfs		100-Year, 24-Hour Storm Event 4,913 cfs	
	See note 5	Available Capacity =2.17 kg/day [1]		Available Capacity = 5.44 kg/day [1]		Available Capacity = 25.38 kg/day [1]		Available Capacity = 42.00 kg/day [1]	
	TMDL LA (ug/l)	Projected Loading (kg/day)	TMDL WLA, LA (kg/day)	Projected Loading (kg/day)	TMDL WLA, LA (kg/day)	Projected Loading (kg/day)	TMDL WLA, LA (kg/day)	Projected Loading (kg/day)	TMDL WLA, LA (kg/day)
BHP NPDES 005 [2, 3]	Note 5	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Collective Undesignated Mine Sources [4]	Note 5	31.1	2.16	80.2	5.43	384.3	25.37	638.8	41.99
BHP NPDES MSGP Stormwater Outfalls	Note 5		Note 5		Note 5		Note 5		Note 5
BHP NPDES 001, 002, 003, and 004 Stormwater Outfalls	0.0		0.0		0.0	0.0			Note 5

[1] Value from Table C-1.

[2] Projected load from BHP NPDES Outfall 005 is calculated using the maximum measured dissolved copper concentration (0.015 mg/l) and the maximum observed flow (0.33 cfs) at the outfall.

[3] WLA established to equal to the projected load from BHP NPDES 005.

[4] LA established to available capacity after allocation to BHP NPDES 005.

[5] The loading capacity is set to equal the water quality standard. The concentration based load allocations and wasteload allocations for the lowest flow tier and for the BHP stormwater outfalls are:

Acute criterion = $e^{(0.9422\ [\ln(\text{hardness})]\ -\ 1.464)}$

Chronic criterion = $e^{(0.8545\ [\ln(\text{hardness})]\ -\ 1.465)}$

Table C-5. Estimated Projected Loading and Load Allocations for Target Site TS-4
Pinto Creek Below the Cactus Breccia Formation (Proposed Carlota Cactus Pit Area); Site of BHP AMP-3

Source			Flow Tier							
	Less than 2-Year, 1-Hour Storm Event 0-238 cfs		2-Year, 1-Hour Storm Event 239 cfs		10-Year, 1-Hour Storm Event 624 cfs		10-Year, 24-Hour Storm Event 3,015 cfs		100-Year, 24-Hour Storm Event 5,021 cfs	
	Available Capacity = WQS		Available Capacity = 0.027 kg/day [1]		Available Capacity = 0.17 kg/day [1]		Available Capacity = 0.87 kg/day [1]		Available Capacity = 1.46 kg/day [1]	
	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)
Cactus Breccia Formation [2]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

[1] Value from Table C-1.

[2] Existing source from Cactus Breccia Formation would be removed by proposed Carlota Copper Cactus Pit and Pinto Creek diversion.

Table C-6. Estimated Projected Loading and Wasteload Allocations for Target Site TS-5
Pinto Creek Immediately Above the Confluence with Haunted Canyon

Source		Flow Tier							
	Less than 2-Year, 1-Hour Storm Event 0-259 cfs	2-Year, 1-Hour Storm Event 260 cfs		10-Year, 1-Hour Storm Event 683 cfs		10-Year, 24-Hour Storm Event 3,346 cfs		100-Year, 24-Hour Storm Event 5,581 cfs	
	See note 5	Available Capacity =0.31 kg/day [1]		Available Capacity = 0.90 kg/day [1]		Available Capacity = 4.76 kg/day [1]		Available Capacity = 8.03 kg/day [1]	
	TMDL WLA, LA (ug/l)	Projected Loading (kg/day)	TMDL WLA, LA [3] (kg/day)	Projected Loading (kg/day)	TMDL WLA, LA [3] (kg/day)	Projected Loading (kg/day)	TMDL WLA, LA [3] (kg/day)	Projected Loading (kg/day)	TMDL WLA, LA [3] (kg/day)
Miller Spring Gulch [2, 3]	Note 5	0.003	0.003	0.003	0.003	0.003	0.003	0.003	0.003
Carlota Main Dump Outfall [4]	Note 5	0.00	0.00	0.00	0.00	0.00	0.00	0.164	1.00
Unallocated Reserve									7.02

[1] Value from Table C-1.

[2] Projected load from Miller Spring Gulch is calculated using the average dissolved copper concentration (0.0093 mg/L) reported by BHP (1999b).

[3] WLA established to equal the projected load from Miller Spring Gulch.

[4] Projected loading from Main Dump computed using the maximum weighted Cu concentration (0.035 mg/L) determined from MWMT testing of waste materials that would be placed in this facility. This concentration was multiplied by an estimated discharge of 23 cfs for a 2-hour period, resulting in a total load of 0.1641 kg of copper (See Section 10.1).

[5] The loading capacity is set to equal the water quality standard. The concentration based load allocations and wasteload allocations for the lowest flow tiers are:

Acute criterion = $e^{(0.9422\ [\ln(\text{hardness})] - 1.464)}$

Chronic criterion = $e^{(0.8545\ [\ln(\text{hardness})] - 1.465)}$

Table C-7. Estimated Projected Loading and Wasteload Allocations for Target Site TS-6 Powers Gulch Immediately Above the Confluence with Haunted Canyon

Source		Flow Tier							
	Less than 2-Year, 1-Hour Storm Event 0-176 cfs	2-Year, 1-Hour Storm Event 177 cfs		10-Year, 1-Hour Storm Event 367 cfs		10-Year, 24-Hour Storm Event 1,337 cfs		100-Year, 24-Hour Storm Event 2,106 cfs	
	Available Capacity = WQS	Available Capacity =2.16 kg/day [1]		Available Capacity = 4.50 kg/day [1]		Available Capacity = 16.38 kg/day [1]		Available Capacity = 25.97 kg/day [1]	
	TMDL WLA (ug/l)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)
Carlota Eder Dump 2-NPDES Outfalls [2, 3]	0.00	0.00	0.00	0.00	0.00	0.025	1.89	0.50	2.97
Carlota Main Dump 4-NPDES Outfalls [3, 4]	0.00	0.00	0.00	0.00	0.00	0.069	3.786	1.35	5.95
Unallocated reserve							10.70		16.87

[1] Value from Table C-1.

[2] Projected loading from Eder Dump was computed using the maximum weighted Cu concentration (0.026 mg/L) determined from MWMT testing of waste materials that would be placed in this facility. Concentration was multiplied by an estimated discharge of 2.4 cfs for a 2-hour period, resulting in a total load of 0.0127 kg of copper at each outfall for the 10-Year, 24-Hour Storm event. Concentration was multiplied by an estimated discharge of 23 cfs for a 4.1 hour period, resulting in a total load of 0.25 kg of copper at each outfall for the 100-Year, 24-Hour Storm event.

[3] WLA based on available loading capacity. For the 10-Year, 24-Hour event, WLA equals 1.24 kg/day for each outfall. For the 100-Year, 24-Hour event, WLA equals 1.95 kg/day for each outfall.

[4] Projected loading from Main Dump was computed using the maximum weighted Cu concentration (0.035 mg/L) determined from MWMT testing of waste materials that would be placed in this facility. Concentration was multiplied by an estimated discharge of 2.4 cfs for a 2-hour period, resulting in a total load of 0.017 kg of copper at each outfall for the 10-Year, 24-Hour storm event. Concentration was multiplied by an estimated discharge of 23 cfs for a 4.1 hour period, resulting in a total load of 0.337 kg of copper at each outfall for the 100-Year, 24-Hour Storm event.

Table C-8. Estimated Projected Loading and Load Allocations for Target Site TS-7
Haunted Canyon Immediately Above the Confluence with Pinto Creek

		Flow Tier							
	Less than 2-Year, 1-Hour Storm Event 0-382 cfs	2-Year, 1-Hour Storm Event 383 cfs		10-Year, 1-Hour Storm Event 919 cfs		10-Year, 24-Hour Storm Event 4,086 cfs		100-Year, 24-Hour Storm Event 6,721 cfs	
	See note 2	Available Capacity = 4.47 kg/day [1]		Available Capacity = 10.82 kg/day [1]		Available Capacity = 33.66 kg/day [1]		Available Capacity = 56.50 kg/day [1]	
Source	TMDL WLA (ug/l)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)	Projected Loading (kg/day)	TMDL WLA (kg/day)
No Sources Identified	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Carlota Wellfield 008	Note 2		Note 2		Note 2		Note 2		Note 2

[1] Value from Table C-1.

[2] The loading capacity is set to equal the water quality standard. The concentration based wasteload allocation for the Carlota 008 outfalls are:

Acute criterion = $e^{(0.9422\ [\ln(\text{hardness})] - 1.464)}$

Chronic criterion = $e^{(0.8545\ [\ln(\text{hardness})] - 1.465)}$

Table C-9. Estimated Projected Loading and Load Allocations for Target Site TS-8
Pinto Creek Immediately Below the Confluence with Haunted Canyon

Source		Flow Tier							
	Less than 2-Year, 1-Hour Storm Event 0-640 cfs	2-Year, 1-Hour Storm Event 640 cfs		10-Year, 1-Hour Storm Event 1,600 cfs		10-Year, 24-Hour Storm Event 7,420 cfs		100-Year, 24-Hour Storm Event 12,287 cfs	
	Available Capacity = WQS	Available Capacity = 4.06 kg/day [1]		Available Capacity = 10.11 kg/day [1]		Available Capacity = 33.64 kg/day [1]		Available Capacity = 49.71 kg/day [1]	
	TMDL LA (ug/l)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)
No Sources Identified	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

[1] Value from Table C-1.

Table C-10. Estimated Projected Loading and Load Allocations for Target Site TS-9
Pinto Creek at the Pinto Valley Weir

Source		Flow Tier							
	Less than 2-Year, 1-Hour Storm Event 0-1914 cfs	2-Year, 1-Hour Storm Event 1,915 cfs		10-Year, 1-Hour Storm Event 4,667 cfs		10-Year, 24-Hour Storm Event 20,786 cfs		100-Year, 24-Hour Storm Event 34,144 cfs	
	See note 4	Available Capacity = 19.30 kg/day [1]		Available Capacity = 46.87 kg/day [1]		Available Capacity = 193.93 kg/day [1]		Available Capacity = 312.57 kg/day [1]	
	TMDL LA (ug/l)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)	Projected Loading (kg/day)	TMDL LA (kg/day)
Gold Gulch Weir [2, 3]	Note 4	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008
South Ripper Spring [2, 3]	Note 4	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004
North Ripper Spring [2, 3]	Note 4	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007	0.0007

[1] Value from Table C-1.

[2] Loads for Gold Gulch, South Ripper Spring, and North Ripper Spring computed using mean dissolved copper value reported by BHP (1999b).

[3] WLA established to equal the projected load.

[4] The loading capacity is set to equal the water quality standard. The concentration based load allocations for the lowest flow tier are:

Acute criterion = $e^{(0.9422\ [\ln(\text{hardness})] - 1.464)}$

Chronic criterion = $e^{(0.8545\ [\ln(\text{hardness})] - 1.465)}$