

## CALCULATIONS OF NEW MEXICO WATER QUALITY-BASED EFFLUENT LIMITATIONS

NMAC 20.6.4. **NMWQS as of June 5, 2013**

(EPA approved site-specific criteria for aluminum, cadmium, and zinc on April 30, 2012)

Calculations Specifications:

Excel **Revised as of July 10, 2012**

Prepared By:

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**STEP 1:** REFERENCE IMPLEMENTATION PROCEDURES  
INPUT FACILITY AND RECEIVING STREAM DATA  
LIST SOURCE OF DATA INPUT

### APPENDIX A of FACT SHEET

#### IMPLEMENTATION PROCEDURES

The State of New Mexico Standards for Interstate and Intrastate Surface Waters are implemented in this spread sheet by using procedures established in the current "Procedures for Implementing NPDES Permits in New Mexico"

FACILITY      BUCKMAN DIRECT DIVERSION

DATA INPUT

Permittee	City of Santa Fe	
NPDES Permit No.	NM0030848	
Outfall No.(s)	1	
Plant Effluent Flow (MGD)	0.28	For industrial and federal facility, use the highest monthly average flow
Plant Effluent Flow (cfs)	0.434	for the past 24 months. For POTWs, use the design flow.

RECEIVING STREAM

DATA INPUT

Receiving Stream Name	Rio Grande	
Basin Name	Rio Grande Basin	
Waterbody Segment Code No.	114	
Is a publicly owned lake or reservoir (enter "1" if it's a lake, "0" if not)	0	
Are acute aquatic life criteria considered (1= yes, 0= no)      (MUST enter "1" for 2005 Standards)	1	
Are chronic aquatic life criteria considered (1= yes, 0=no)	1	
Are domestic water supply criteria considered (1= yes, 0=no)	1	
Are irrigation water supply criteria considered (1= yes, 0=no)	1	
Livestock watering and wildlife habitat criteria applied to all streams	1	
USGS Flow Station	USGS	
WQ Monitoring Station No.	SJR	
Receiving Stream TSS (mg/l)	14.97	For intermittent stream, enter effluent TSS
Receiving Stream Hardness (mg/l as CaCO <sub>3</sub> )      RANGE: 0 - 400	138.2	For intermittent stream, enter effluent Hardness (If no data, 20 mg/l is used)
Receiving Stream Critical Low Flow (4Q3) (cfs)	367	Enter "0" for intermittent stream and lake.
Receiving Stream Harmonic Mean Flow (cfs)	900	Enter harmonic mean or modified harmonic mean flow data or 0.001 if no data is available
Avg. Receiving Water Temperature (C)	14.97	
pH (Avg), Receiving Stream	8.23	
Fraction of stream allowed for mixing (F)	1	Enter 1, if stream morphology data is not available or for intermittent streams.
Fraction of Critical Low Flow	367	

**STEP 2:** INPUT AMBIENT AND EFFLUENT DATA

## CALCULATE IN-STREAM WASTE CONCENTRATIONS

## DATA INPUT

Input pollutant geometric mean concentration as micro-gram per liter (ug/l or ppb)

unless other unit is specified for the parameter.

Effluent value reported as "< detection level" (DL) but the DL is greater than MQL, input "1/2 DL" for calculation.

Effluent value reported as "< detection level" (DL) and the DL is smaller than MQL, no data is inputted.

If a less than MQL value is reported, input either the reported value or "0" for calculation.

The following formula is used to calculate the Instream Waste Concentration (Cd)

See the current "Procedures for Implementing NPDES Permits in New Mexico"

$$Cd = [(F \cdot Qa \cdot Ca) + (Qe \cdot 2.13 \cdot Ce)] / (F \cdot Qa + Qe)$$

Where:

Cd = Instream Waste Concentration

F = Fraction of stream allowed for mixing (see "Procedures for Implementing NPDES Permits in New Mexico")

Ce = Reported concentration in effluent

Ca = Ambient stream concentration upstream of discharge

Qe = Plant effluent flow

Qa = Critical low flow of stream at discharge point expressed as the 4Q3 or harmonic mean flow for human health criteria

The following formula convert metals reported in total form to dissolved form if criteria are in dissolved form

See the current "Procedures for Implementing NPDES Permits in New Mexico"

$$Kp = Kpo \cdot (TSS)^a$$

Kp = Linear partition coefficient; Kpo and a can be found in table below

$$C/Ct = 1 / (1 + Kp \cdot TSS \cdot 10^{-6})$$

TSS = Total suspended solids concentration found in receiving stream (or in effluent for intermittent stream)

$$\text{Total Metal Criteria (Ct)} = Cr / (C/Ct)$$

C/Ct = Fraction of metal dissolved; and Cr = Dissolved criteria value

Total Metals	Total Value	Stream Linear Partition Coefficient					Lake Linear Partition Coefficient				
		Kpo	alpha (a)	Kp	C/Ct	Dissolved Value in Stream	Kpo	alpha (a)	Kp	C/Ct	Dissolved Value in Lake
Arsenic		480000	-0.73	66577.78205	0.50083404	0	480000	-0.73	66577.78205	0.50083404	0
Chromium III		3360000	-0.93	271258.2796	0.197599699	0	2170000	-0.27	1045080.749	0.060078611	0
Copper		1040000	-0.74	140400.6787	0.32239364	0	2850000	-0.9	249542.9126	0.211163924	0
Lead		2800000	-0.8	321351.6921	0.172098235	0	2040000	-0.53	486141.4066	0.120808885	0
Nickel		490000	-0.57	104789.955	0.389301129	0	2210000	-0.76	282633.5448	0.191167154	0
Silver		2390000	-1.03	147203.9442	0.312144639	0	2390000	-1.03	147203.9442	0.312144639	0
Zinc		1250000	-0.7	188041.9529	0.26212402	0	3340000	-0.68	530390.3851	0.111857523	0

The following formula is used to calculate hardness dependent criteria

(Please refer to State Water Quality Standards for details)

Dissolved

WQC (ug/l)

Aluminum (T)	Acute	$e(1.3695[\ln(\text{hardness})]+1.8308)$	5327.606037	If Stream pH < 6.5, enter 750 in cell O113
	Chronic	$e(1.3695[\ln(\text{hardness})]+0.9161)$	2134.43503	If Stream pH < 6.5, enter 87 in cell P113
Cadmium (D)	Acute	$e(0.8968[\ln(\text{hardness})]-3.5699) \cdot CF1$	2.177307504	$CF1 = 1.136672 - 0.041838 \cdot \ln(\text{hardness})$
	Chronic	$e(0.7647[\ln(\text{hardness})]-4.2180) \cdot CF2$	0.57153256	$CF2 = 1.101672 - 0.041838 \cdot \ln(\text{hardness})$

		Dissolved WQC (ug/l)	
Chromium III (D)	Acute	$0.316 e^{(0.819[\ln(\text{hardness})]+3.7256)}$	742.6269259
	Chronic	$0.860 e^{(0.819[\ln(\text{hardness})]+0.6848)}$	96.60050565
Copper (D)	Acute	$0.960 e^{(0.9422[\ln(\text{hardness})]-1.700)}$	18.22876692
	Chronic	$0.960 e^{(0.8545[\ln(\text{hardness})]-1.702)}$	11.80772276
Lead (D)	Acute	$e^{(1.273[\ln(\text{hardness})]-1.46)*CF3}$	91.68270319
	Chronic	$e^{(1.273[\ln(\text{hardness})]-4.705)*CF4}$	3.57274332
Manganese (D)	Acute	$e^{(0.3331[\ln(\text{hardness})]+6.4676)}$	3325.417824
	Chronic	$e^{(0.3331[\ln(\text{hardness})]+5.8743)}$	1837.296739
Nickel (D)	Acute	$0.998 e^{(0.846[\ln(\text{hardness})]+2.255)}$	615.6507351
	Chronic	$0.997 e^{(0.846[\ln(\text{hardness})]+0.0584)}$	68.37978965
Silver (D)	Acute	$0.85 e^{(1.72[\ln(\text{hardness})]-6.59)}$	5.61167
Zinc (D)	Acute	$0.978 e^{(0.9094[\ln(\text{hardness})]+0.9095)}$	214.7374049
	Chronic	$0.986 e^{(0.90947[\ln(\text{hardness})]+0.6235)}$	162.6999331

CF3 = 1.46203 - 0.145712\*ln(hardness)

CF4 = 1.46203 - 0.145712\*ln(hardness)

POLLUTANTS	CAS No.	MQL	Instream Waste Concentration							Irrigation Criteria ug/l	Livestock& Wildlife Criteria ug/l	Acute Aquatic Criteria ug/l	Chronic Aquatic Criteria ug/l	Human Health Criteria ug/l	Need TMDL
			Ambient Conc. Ca (ug/l)	Effluent Conc. Ce (ug/l)	Acute Aquatic 2.13*Ce	Domestic Supply Cd,dom (ug/l)	Chronic Aquatic Cd (ug/l)	Human Health Cd,hh (ug/l)	Domestic Criteria ug/l						
<b>Radioactivity, Nutrients, and Chlorine</b>															
Aluminum, total	7429-90-5	2.5	20.935	62.77	133.7001	21.0681941	21.0681941	20.9893516	1E+100	5000	1E+100	5327.606037	2134.43503	1E+100	N/A
Barium, dissolved	7440-39-3	100	54.19	56.65	120.6645	54.2685173	54.2685173	54.22204	2000	1E+100	1E+100	1E+100	1E+100	1E+100	N/A
Boron, dissolved	7440-42-8	100	26.91	26.72	56.9136	26.9454392	26.9454392	26.9244614	1E+100	750	5000	1E+100	1E+100	1E+100	N/A
Cobalt, dissolved	7440-48-4	50	1.299	8.605	18.32865	1.31911482	1.31911482	1.30720812	1E+100	50	1000	1E+100	1E+100	1E+100	N/A
Uranium, dissolved	7440-61-1	0.1	1.7835	1.795	3.82335	1.7859094	1.7859094	1.78448319	30	1E+100	1E+100	1E+100	1E+100	1E+100	N/A
Vanadium, dissolved	7440-62-2	50	6.946	10.698	22.78674	6.96471052	6.96471052	6.95363508	1E+100	100	100	1E+100	1E+100	1E+100	N/A
Ra-226 and Ra-228 (pCi/l)			0.9149	1.621	3.45273	0.91789759	0.91789759	0.91612321	5	1E+100	30	1E+100	1E+100	1E+100	N/A
Strontium (pCi/l)			0.079	0.329	0.70077	0.07973441	0.07973441	0.07929969	8	1E+100	1E+100	1E+100	1E+100	1E+100	N/A
Tritium (pCi/l)			65.982	126.649	269.76237	66.2226981	66.2226981	66.0802201	20000	1E+100	20000	1E+100	1E+100	1E+100	N/A
Gross Alpha (pCi/l)				3.118	6.64134	0.00784452	0.00784452	0.00320106	15	1E+100	15	1E+100	1E+100	1E+100	N/A
Asbestos (fibers/l)			0	7174000	15280620	18048.926	18048.926	7365.10292	7000000	1E+100	1E+100	1E+100	1E+100	1E+100	N/A
Total Residual Chlorine	7782-50-5	33		0	0	0	0	0	1E+100	1E+100	11	19	11	1E+100	N/A
Nitrate as N (mg/l)			0.10342	0.5187	1.104831	0.10460723	0.10460723	0.10390707	10	1E+100	1E+100	1E+100	1E+100	1E+100	N/A
Nitrite + Nitrate (mg/l)			0.50943	0.903333	1.92409929	0.51109896	0.51109896	0.51010986	1E+100	1E+100	132	1E+100	1E+100	1E+100	N/A
<b>METALS AND CYANIDE</b>															
Antimony, dissolved (P)	7440-36-0	60	0.5492	1.462	3.11406	0.55222952	0.55222952	0.55043624	6	1E+100	1E+100	1E+100	1E+100	640	N/A
Arsenic, dissolved (P)	7440-38-2	0.5	1.823	1.805	3.84465	1.8253879	1.8253879	1.82397441	10	100	200	340	150	9	N/A
Beryllium, dissolved	7440-41-7	0.5	0	0	0	0	0	0	4	1E+100	1E+100	1E+100	1E+100	1E+100	N/A
Cadmium, dissolved	7440-43-9	1	0	0	0	0	0	0	5	10	50	2.177307504	0.57153256	1E+100	N/A
Chromium (III), dissolved	16065-83-1	10		0	0	0	0	0	1E+100	1E+100	1E+100	742.6269259	96.6005056	1E+100	N/A
Chromium (VI), dissolved	18540-29-9	10		0	0	0	0	0	1E+100	1E+100	1E+100	16	11	1E+100	N/A
Chromium, dissolved	7440-47-3		1.447	2.867	6.10671	1.45250388	1.45250388	1.44924593	100	100	1000	1E+100	1E+100	1E+100	N/A
Copper, dissolved	7440-50-8	0.5	0.783	1.645	3.50385	0.78621377	0.78621377	0.78431142	1300	200	500	18.22876692	11.8077228	1E+100	N/A
Lead, dissolved	7439-92-1	0.5	0.1843	0.338833	0.72171429	0.18493477	0.18493477	0.18455903	15	5000	100	91.68270319	3.57274332	1E+100	N/A
Manganese, dissolved	7439-96-5			10.6	22.578	0.02666833	0.02666833	0.01088237	1E+100	1E+100	1E+100	3325.417824	1837.29674	1E+100	N/A

POLLUTANTS	CAS No.	MQL	Instream Waste Concentration							Livestock&	Acute	Chronic	Human	Need	Health	TMDL
			Ambient	Effluent	Acute	Domestic	Chronic	Human	Domestic	Irrigation	Wildlife	Aquatic	Aquatic			
			Conc	Conc.	Aquatic	Supply	Aquatic	Health	Criteria	Criteria	Criteria	Criteria	Criteria			
			Ca (ug/l)	Ce (ug/l)	2.13°Ce	Cd,dom (ug/l)	Cd (ug/l)	Cd,hh (ug/l)	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
Mercury, dissolved	7439-97-6	0.005	0.069	0.033667	0.07171071	8.4702E-05	8.4702E-05	3.4564E-05	1E+100	1E+100	1E+100	1.4	0.77	1E+100	N/A	
Mercury, total	7439-97-6	0.005	0.069	0.007793	0.01659909	0.06893811	0.06893811	0.06897474	2	1E+100	0.77	1E+100	1E+100	1E+100	N/A	
Molybdenum, dissolved	7439-98-7		4.42	4.6067	9.812271	4.42636916	4.42636916	4.42259902	1E+100	1000	1E+100	1E+100	1E+100	1E+100	N/A	
Molybdenum, total recoverable	7439-98-7			0	0	0	0	0	1E+100	1E+100	1E+100	7920	1895	1E+100	N/A	
Nickel, dissolved (P)	7440-02-0	0.5	0.6208	1.25583	2.6749179	0.62322625	0.62322625	0.62179006	700	1E+100	1E+100	615.6507351	68.3797896	4600	N/A	
Selenium, dissolved (P)	7782-49-2	5		0	0	0	0	0	50	130	50	1E+100	1E+100	4200	N/A	
Selenium, dis (SO4 >500 mg/l)		5			0	0	0	0	50	250	50	1E+100	1E+100	4200	N/A	
Selenium, total recoverable	7782-49-2	5			0	0	0	0	1E+100	1E+100	5	20	5	1E+100	N/A	
Silver, dissolved	7440-22-4	0.5	0	0.1767	0.376371	0.00044456	0.00044456	0.00018141	1E+100	1E+100	1E+100	5.61167	1E+100	1E+100	N/A	
Thallium, dissolved (P)	7440-28-0	0.5	0	0.08833	0.1881429	0.00022223	0.00022223	9.0683E-05	2	1E+100	1E+100	1E+100	1E+100	0.47	N/A	
Zinc, dissolved	7440-66-6	20	8.909	15.76	33.5688	8.93812728	8.93812728	8.92088577	10500	2000	25000	214.7374049	162.699933	26000	N/A	
Cyanide, total recoverable	57-12-5	10		0	0	0	0	0	200	1E+100	5.2	22	5.2	140	N/A	
Dioxin	1764-01-6	0.00001	0	0.0000004	0.000000852	1.0064E-09	1.0064E-09	4.1066E-10	3.00E-05	1E+100	1E+100	1E+100	1E+100	5.1E-08	N/A	
<b>VOLATILE COMPOUNDS</b>																
Acrolein	107-02-8	50	0	0	0	0	0	0	18	1E+100	1E+100	1E+100	1E+100	9	N/A	
Acrylonitrile	107-13-0	20	0	10	21.3	0.0251588	0.0251588	0.01026638	0.65	1E+100	1E+100	1E+100	1E+100	2.5	N/A	
Benzene	71-43-2	10	0	0	0	0	0	0	5	1E+100	1E+100	1E+100	1E+100	510	N/A	
Bromoform	75-25-2	10	0	0	0	0	0	0	44	1E+100	1E+100	1E+100	1E+100	1400	N/A	
Carbon Tetrachloride	56-23-5	2	0	0.83333	1.7749929	0.00209656	0.00209656	0.00085553	5	1E+100	1E+100	1E+100	1E+100	16	N/A	
Chlorobenzene	108-90-7	10	0	0	0	0	0	0	100	1E+100	1E+100	1E+100	1E+100	1600	N/A	
Clorodibromomethane	124-48-1	10	0	1.83333	3.9049929	0.00461244	0.00461244	0.00188217	4.2	1E+100	1E+100	1E+100	1E+100	130	N/A	
Chloroform	67-66-3	50	0	0	0	0	0	0	57	1E+100	1E+100	1E+100	1E+100	4700	N/A	
Dichlorobromomethane	75-27-4	10	0	1.8393	3.917709	0.00462746	0.00462746	0.0018883	5.6	1E+100	1E+100	1E+100	1E+100	170	N/A	
1,2-Dichloroethane	107-06-2	10	0	0	0	0	0	0	5	1E+100	1E+100	1E+100	1E+100	370	N/A	
1,1-Dichloroethylene	75-35-4	10	0.33342	0.956	2.03628	0.33543336	0.33543336	0.33424276	7	1E+100	1E+100	1E+100	1E+100	7100	N/A	
1,2-Dichloropropane	78-87-5	10	0	0	0	0	0	0	5	1E+100	1E+100	1E+100	1E+100	150	N/A	
1,3-Dichloropropylene	542-75-6	10	0	0	0	0	0	0	3.5	1E+100	1E+100	1E+100	1E+100	210	N/A	
Ethylbenzene	100-41-4	10	0	1.0195	2.171535	0.00256494	0.00256494	0.00104666	700	1E+100	1E+100	1E+100	1E+100	2100	N/A	
Methyl Bromide	74-83-9	50	0	0	0	0	0	0	49	1E+100	1E+100	1E+100	1E+100	1500	N/A	
Methylene Chloride	75-09-2	20	0.5971	1.43	3.0459	0.59999244	0.59999244	0.5982803	5	1E+100	1E+100	1E+100	1E+100	5900	N/A	
1,1,2,2-Tetrachloroethane	79-34-5	10	0	0	0	0	0	0	1.8	1E+100	1E+100	1E+100	1E+100	40	N/A	
Tetrachloroethylene	127-18-4	10	0	0	0	0	0	0	5	1E+100	1E+100	1E+100	1E+100	33	N/A	
Toluene	108-88-3	10	0	8.877	18.90801	0.02233347	0.02233347	0.00911347	1000	1E+100	1E+100	1E+100	1E+100	15000	N/A	
1,2-trans-Dichloroethylene	156-60-5	10	0	0	0	0	0	0	100	1E+100	1E+100	1E+100	1E+100	10000	N/A	
1,1,1-Trichloroethane	71-55-6	10	0	1.83	3.8979	0.00460406	0.00460406	0.00187875	200	1E+100	1E+100	1E+100	1E+100	1E+100	N/A	
1,1,2-Trichloroethane	79-00-5	10	0	0	0	0	0	0	5	1E+100	1E+100	1E+100	1E+100	160	N/A	
Trichloroethylene	79-01-6	10	0.8649	4.0956	8.723628	0.87418145	0.87418145	0.86868683	5	1E+100	1E+100	1E+100	1E+100	300	N/A	
Vinyl Chloride	75-01-4	10	0.5	1.125	2.39625	0.50223978	0.50223978	0.50091397	2	1E+100	1E+100	1E+100	1E+100	24	N/A	
<b>ACID COMPOUNDS</b>																
2-Chlorophenol	95-57-8	10	0	0	0	0	0	0	175	1E+100	1E+100	1E+100	1E+100	150	N/A	
2,4-Dichlorophenol	120-83-2	10	0	0	0	0	0	0	105	1E+100	1E+100	1E+100	1E+100	290	N/A	
2,4-Dimethylphenol	105-67-9	10	0	0	0	0	0	0	700	1E+100	1E+100	1E+100	1E+100	850	N/A	
4,6-Dinitro-o-Cresol	534-52-1	50			0	0	0	0	14	1E+100	1E+100	1E+100	1E+100	280	N/A	

POLLUTANTS	CAS No.	MQL	Instream Waste Concentration							Domestic	Irrigation	Livestock& Wildlife	Acute Aquatic	Chronic Aquatic	Human Health	Need TMDL
			Ambient	Effluent	Acute	Domestic	Chronic	Human	Domestic							
			Conc	Conc.	Aquatic	Supply	Aquatic	Health	Criteria							
			Ca (ug/l)	Ce (ug/l)	2.13*Ce	Cd,dom (ug/l)	Cd (ug/l)	Cd,hh (ug/l)	ug/l	ug/l	ug/l	ug/l	ug/l	ug/l		
2,4-Dinitrophenol	51-28-5	50	0	0	0	0	0	0	70	1E+100	1E+100	1E+100	1E+100	5300	N/A	
Pentachlorophenol	87-86-5	50	0	0	0	0	0	0	1	1E+100	1E+100	19	15	30	N/A	
Phenol	108-95-2	10	0	0	0	0	0	0	10500	1E+100	1E+100	1E+100	1E+100	860000	N/A	
2,4,6-Trichlorophenol	88-06-2	10	0	0	0	0	0	0	32	1E+100	1E+100	1E+100	1E+100	24	N/A	
<b>BASE/NEUTRAL</b>																
Acenaphthene	83-32-9	10	0	0	0	0	0	0	2100	1E+100	1E+100	1E+100	1E+100	990	N/A	
Anthracene	120-12-7	10	0	0	0	0	0	0	10500	1E+100	1E+100	1E+100	1E+100	40000	N/A	
Benzidine	92-87-5	50	0	0	0	0	0	0	0.0015	1E+100	1E+100	1E+100	1E+100	0.002	N/A	
Benzo(a)anthracene	56-55-3	5	0	0	0	0	0	0	0.048	1E+100	1E+100	1E+100	1E+100	0.18	N/A	
Benzo(a)pyrene	50-32-8	5	0	0	0	0	0	0	0.2	1E+100	1E+100	1E+100	1E+100	0.18	N/A	
3,4-Benzofluoranthene	205-99-2	10	0	2	4.26	0.00503176	0.00503176	0.00205328	0.048	1E+100	1E+100	1E+100	1E+100	0.18	N/A	
Benzo(k)fluoranthene	207-08-9	5	0	0	0	0	0	0	0.048	1E+100	1E+100	1E+100	1E+100	0.18	N/A	
Bis(2-chloroethyl)Ether	111-44-4	10	0	0	0	0	0	0	0.3	1E+100	1E+100	1E+100	1E+100	5.3	N/A	
Bis(2-chloroisopropyl)Ether	108-60-1	10	0	0	0	0	0	0	1400	1E+100	1E+100	1E+100	1E+100	65000	N/A	
Bis(2-ethylhexyl)Phthalate	117-81-7	10	0	0	0	0	0	0	6	1E+100	1E+100	1E+100	1E+100	22	N/A	
Butyl Benzyl Phthalate	85-68-7	10	0	0	0	0	0	0	7000	1E+100	1E+100	1E+100	1E+100	1900	N/A	
2-Chloronaphthalene	91-58-7	10	0	0	0	0	0	0	2800	1E+100	1E+100	1E+100	1E+100	1600	N/A	
Chrysene	218-01-9	5	0	0	0	0	0	0	0.048	1E+100	1E+100	1E+100	1E+100	0.18	N/A	
Dibenzo(a,h)anthracene	53-70-3	5	0	0	0	0	0	0	0.048	1E+100	1E+100	1E+100	1E+100	0.18	N/A	
1,2-Dichlorobenzene	95-50-1	10	0	0	0	0	0	0	600	1E+100	1E+100	1E+100	1E+100	1300	N/A	
1,3-Dichlorobenzene	541-73-1	10	0	0	0	0	0	0	469	1E+100	1E+100	1E+100	1E+100	960	N/A	
1,4-Dichlorobenzene	106-46-7	10	0	0	0	0	0	0	75	1E+100	1E+100	1E+100	1E+100	190	N/A	
3,3'-Dichlorobenzidine	91-94-1	5	0	0	0	0	0	0	0.78	1E+100	1E+100	1E+100	1E+100	0.28	N/A	
Diethyl Phthalate	84-66-2	10	0	0	0	0	0	0	28000	1E+100	1E+100	1E+100	1E+100	44000	N/A	
Dimethyl Phthalate	131-11-3	10	0	0	0	0	0	0	350000	1E+100	1E+100	1E+100	1E+100	1100000	N/A	
Di-n-Butyl Phthalate	84-74-2	10	0	0	0	0	0	0	3500	1E+100	1E+100	1E+100	1E+100	4500	N/A	
2,4-Dinitrotoluene	121-14-2	10	0	0	0	0	0	0	1.1	1E+100	1E+100	1E+100	1E+100	34	N/A	
1,2-Diphenylhydrazine	122-66-7	20	0	0	0	0	0	0	0.44	1E+100	1E+100	1E+100	1E+100	2	N/A	
Fluoranthene	206-44-0	10	0	0	0	0	0	0	1400	1E+100	1E+100	1E+100	1E+100	140	N/A	
Fluorene	86-73-7	10	0	0	0	0	0	0	1400	1E+100	1E+100	1E+100	1E+100	5300	N/A	
Hexachlorobenzene	118-74-1	5	0	0	0	0	0	0	1	1E+100	1E+100	1E+100	1E+100	0.0029	N/A	
Hexachlorobutadiene	87-68-3	10	0	0	0	0	0	0	4.5	1E+100	1E+100	1E+100	1E+100	180	N/A	
Hexachlorocyclopentadiene	77-47-4	10	0	0	0	0	0	0	50	1E+100	1E+100	1E+100	1E+100	1100	N/A	
Hexachloroethane	67-72-1	20	0	0	0	0	0	0	25	1E+100	1E+100	1E+100	1E+100	33	N/A	
Indeno(1,2,3-cd)Pyrene	193-39-5	5	0	0	0	0	0	0	0.048	1E+100	1E+100	1E+100	1E+100	0.18	N/A	
Isophorone	78-59-1	10	0	0	0	0	0	0	368	1E+100	1E+100	1E+100	1E+100	9600	N/A	
Nitrobenzene	98-95-3	10	0	0	0	0	0	0	18	1E+100	1E+100	1E+100	1E+100	690	N/A	
n-Nitrosodimethylamine	62-75-9	50	0	0	0	0	0	0	0.0069	1E+100	1E+100	1E+100	1E+100	30	N/A	
n-Nitrosodi-n-Propylamine	621-64-7	20	0	0	0	0	0	0	0.05	1E+100	1E+100	1E+100	1E+100	5.1	N/A	
n-Nitrosodiphenylamine	86-30-6	20	0	0	0	0	0	0	71	1E+100	1E+100	1E+100	1E+100	60	N/A	
Nonylphenol	84852-15-3				0	0	0	0	1E+100	1E+100	1E+100	28	6.6	1E+100	N/A	
Pyrene	129-00-0	10	0	0	0	0	0	0	1050	1E+100	1E+100	1E+100	1E+100	4000	N/A	
1,2,4-Trichlorobenzene	120-82-1	10	0	0	0	0	0	0	70	1E+100	1E+100	1E+100	1E+100	70	N/A	

POLLUTANTS	CAS No.	MQL	Instream Waste Concentration							Domestic Criteria ug/l	Irrigation Criteria ug/l	Livestock& Wildlife Criteria ug/l	Acute Aquatic Criteria ug/l	Chronic Aquatic Criteria ug/l	Human Health Criteria ug/l	Need TMDL
			Ambient Conc	Effluent Conc.	Acute Aquatic	Domestic Supply	Chronic Aquatic	Human Health	Domestic Criteria							
			Ca (ug/l)	Ce (ug/l)	2.13*Ce	Cd,dom (ug/l)	Cd (ug/l)	Cd,hh (ug/l)	ug/l							
<b>PESTICIDES AND PCBs</b>																
Aldrin	309-00-2	0.01	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	0.021	1E+100	1E+100	3	1E+100	0.0005	N/A	
Alpha-BHC	319-84-6	0.05	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	0.056	1E+100	1E+100	1E+100	1E+100	0.049	N/A	
Beta-BHC	319-85-7	0.05	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	0.091	1E+100	1E+100	1E+100	1E+100	0.17	N/A	
Gamma-BHC	58-89-9	0.05	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	0.2	1E+100	1E+100	0.95	1E+100	1.8	N/A	
Chlordane	57-74-9	0.2	0	0	0	0	0	0	2	1E+100	1E+100	2.4	0.0043	0.0081	N/A	
4,4'-DDT and derivatives	50-29-3	0.02	0	0	0	0	0	0	1	1E+100	0.001	1.1	0.001	0.0022	N/A	
Dieldrin	60-57-1	0.02	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	0.022	1E+100	1E+100	0.24	0.056	0.00054	N/A	
Diazinon	333-41-5			0	0	0	0	0	1E+100	1E+100	1E+100	0.17	0.17	1E+100	N/A	
Alpha-Endosulfan	959-98-8	0.01	0	0.03333	0.0709929	8.3854E-05	8.3854E-05	3.4218E-05	62	1E+100	1E+100	0.22	0.056	89	N/A	
Beta-Endosulfan	33213-65-9	0.02	0	0.033333	0.07099929	8.3862E-05	8.3862E-05	3.4221E-05	62	1E+100	1E+100	0.22	0.056	89	N/A	
Endosulfan sulfate	1031-7-8	0.1	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	62	1E+100	1E+100	1E+100	1E+100	89	N/A	
Endrin	72-20-8	0.02	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	2	1E+100	1E+100	0.086	0.036	0.06	N/A	
Endrin Aldehyde	7421-93-4	0.1	0	0	0	0	0	0	10.5	1E+100	1E+100	1E+100	1E+100	0.3	N/A	
Heptachlor	76-44-8	0.01	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	0.4	1E+100	1E+100	0.52	0.0038	0.00079	N/A	
Heptachlor Epoxide	1024-57-3	0.01	0	0.0167	0.035571	4.2015E-05	4.2015E-05	1.7145E-05	0.2	1E+100	1E+100	0.52	0.0038	0.00039	N/A	
PCBs	1336-36-3	0.2	5.4E-05	5.34818E-05	0.000113916	5.4495E-05	5.4495E-05	5.4453E-05	0.5	1E+100	0.014	2	0.014	0.00064	N/A	
Toxaphene	8001-35-2	0.3	0	0	0	0	0	0	3	1E+100	1E+100	0.73	0.0002	0.0028	N/A	

**STEP 3:** SCAN POTENTIAL INSTREAM WASTE CONCENTRATIONS AGAINST WATER QUALITY CRITERIA  
AND ESTABLISH EFFLUENT LIMITATIONS FOR ALL APPLICABLE PARAMETERS

No limits are established if the receiving stream is not designated for the particular uses.

No limits are established if the potential instream waste concentrations are less than the chronic water quality criteria.

The most applicable stringent criteria are used to establish effluent limitations for a given parameter.

Water quality criteria apply at the end-of-pipe for acute aquatic life criteria and discharges to public lakes.

If background concentration exceeds the water quality criteria, water quality criteria apply. And "Need TMDL" shown to the next column of Avg. Mass

Monthly avg concentration = daily max. / 1.5.

APPLICABLE WATER QUALITY-BASED LIMITS

The following formula is used to calculate the allowable daily maximum effluent concentration

See the current "Procedures for Implementing NPDES Permits in New Mexico"

Daily Max. Conc. =  $C_s + (C_s - C_a)(F \cdot Q_a / Q_e)$

Monthly Avg. Conc. = Daily Max. Conc. / 1.5

Where:

$C_s$  = Applicable water quality standard

$C_a$  = Ambient stream concentration

$F$  = Fraction of stream allowed for mixing (1.0 is assigned to domestic water supply and human health uses)

$Q_e$  = Plant effluent flow

$Q_a$  = Criteria Low flow (4Q3) or Harmonic Mean flow for Human Health Criteria







