

# CALCULATIONS OF NEW MEXICO WATER QUALITY-BASED EFFLUENT LIMITATIONS

NMAC 20.6.4. **NMWQS as of January 14, 2011**

(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:

4-Jun-26 11:10 AM

**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

#### DATA INPUT

|                           |        |                                |
|---------------------------|--------|--------------------------------|
| Permittee                 |        |                                |
| NPDES Permit No.          |        |                                |
| Outfall No.(s)            | 2      |                                |
| Plant Effluent Flow (MGD) | 0.63   |                                |
| Plant Effluent Flow (cfs) | 0.9765 | Antidegradation updated 5/6/26 |

#### RECEIVING STREAM

#### DATA INPUT

|                                                                                                |   |
|------------------------------------------------------------------------------------------------|---|
| Receiving Stream Name                                                                          |   |
| Basin Name                                                                                     |   |
| Waterbody Segment Code No.                                                                     |   |
| 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)                                   | 0 |
| Are irrigation water supply criteria considered (1= yes, 0=no)                                 | 1 |
| Livestock watering and wildlife habitat criteria applied to all streams                        |   |

|                                                        |               |                                                                                          |
|--------------------------------------------------------|---------------|------------------------------------------------------------------------------------------|
| USGS Flow Station                                      |               |                                                                                          |
| WQ Monitoring Station No.                              | 28RedRiv014.0 |                                                                                          |
| Receiving Stream TSS (mg/l)                            | 23            | For intermittent stream, enter effluent TSS                                              |
| Receiving Stream Hardness (mg/l as CaCO <sub>3</sub> ) | 207           | For intermittent stream, enter effluent Hardness (If no data, 20 mg/l is used)           |
| Receiving Stream Critical Low Flow (4Q3) (cfs)         | 12.25         | Antidegradation updated 5/6/25                                                           |
| Receiving Stream Harmonic Mean Flow (cfs)              | 28.04         | Enter harmonic mean or modified harmonic mean flow data or 0.001 if no data is available |
| Avg. Receiving Water Temperature (C)                   | 8.9           |                                                                                          |
| pH (Avg), Receiving Stream                             | 7.7           |                                                                                          |
| 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                          | 12.25         |                                                                                          |

**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      | 0.66        | 480000                              | -0.73     | 48660.87535 | 0.47187615  | 0.31143826                | 480000                            | -0.73     | 48660.87535 | 0.47187615  | 0.31143826              |
| Chromium III |             | 3360000                             | -0.93     | 181941.7593 | 0.192876661 | 0                         | 2170000                           | -0.27     | 930664.6499 | 0.044632323 | 0                       |
| Copper       | 0.37        | 1040000                             | -0.74     | 102177.3749 | 0.298500368 | 0.11044514                | 2850000                           | -0.9      | 169546.8821 | 0.204099198 | 0.0755167               |
| Lead         | 0.018       | 2800000                             | -0.8      | 227916.4976 | 0.160203023 | 0.00288365                | 2040000                           | -0.53     | 387181.3362 | 0.100957371 | 0.00181723              |
| Nickel       | 0.72        | 490000                              | -0.57     | 82037.27261 | 0.346397451 | 0.24940616                | 2210000                           | -0.76     | 203929.0604 | 0.175735547 | 0.12652959              |
| Silver       |             | 2390000                             | -1.03     | 94584.1205  | 0.314917506 | 0                         | 2390000                           | -1.03     | 94584.1205  | 0.314917506 | 0                       |
| Zinc         | 1.01        | 1250000                             | -0.7      | 139219.6469 | 0.237978975 | 0.24035877                | 3340000                           | -0.68     | 396069.626  | 0.098915868 | 0.09990503              |

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   | $e(1.3695[\ln(\text{hardness})]+1.8308)$           | 9264.622447 | If Stream pH < 6.5, enter 750 in cell O113             |
|              | Chronic | $e(1.3695[\ln(\text{hardness})]+0.9161)$           | 3711.748682 | If Stream pH < 6.5, enter 87 in cell P113              |
| Cadmium (D)  | Acute   | $e(0.8968[\ln(\text{hardness})]-3.5699) \cdot CF1$ | 3.071229171 | $CF1 = 1.136672 - 0.041838 \cdot \ln(\text{hardness})$ |
|              | Chronic | $e(0.7647[\ln(\text{hardness})]-4.2180) \cdot CF2$ | 0.763731443 | $CF2 = 1.101672 - 0.041838 \cdot \ln(\text{hardness})$ |

|                  |         |                                       | Dissolved<br>WQC (ug/l) |                                       |
|------------------|---------|---------------------------------------|-------------------------|---------------------------------------|
| Chromium III (D) | Acute   | 0.316 e(0.819[ln(hardness)]+3.7256)   | 1033.889958             |                                       |
|                  | Chronic | 0.860 e(0.819[ln(hardness)]+0.6848)   | 134.4878421             |                                       |
| Copper (D)       | Acute   | 0.960 e(0.9422[ln(hardness)]-1.700)   | 26.67336902             |                                       |
|                  | Chronic | 0.960 e(0.8545[ln(hardness)]-1.702)   | 16.67626105             |                                       |
| Lead (D)         | Acute   | e(1.273[ln(hardness)]-1.46)*CF3       | 141.2029685             | CF3 = 1.46203 - 0.145712*ln(hardness) |
|                  | Chronic | e(1.273[ln(hardness)]-4.705)*CF4      | 5.502476966             | CF4 = 1.46203 - 0.145712*ln(hardness) |
| Manganese (D)    | Acute   | e(0.3331[ln(hardness)]+6.4676)        | 3804.457293             |                                       |
|                  | Chronic | e(0.3331[ln(hardness)]+5.8743)        | 2101.966533             |                                       |
| Nickel (D)       | Acute   | 0.998 e(0.846[ln(hardness)]+2.255)    | 866.5138531             |                                       |
|                  | Chronic | 0.997 e(0.846[ln(hardness)]+0.0584)   | 96.24293714             |                                       |
| Silver (D)       | Acute   | 0.85 e(1.72[ln(hardness)]-6.59)       | 11.24313134             |                                       |
| Zinc (D)         | Acute   | 0.978 e(0.9094[ln(hardness)]+0.9095)  | 310.0795451             |                                       |
|                  | Chronic | 0.986 e(0.90947[ln(hardness)]+0.6235) | 234.9443873             |                                       |

| POLLUTANTS                                    |            |                               |                                | Instream Waste Concentration |               |            |              |            |            |        |        | Livestock&<br>Wildlife<br>Criteria<br>ug/l | Acute<br>Aquatic<br>Criteria<br>ug/l | Chronic<br>Aquatic<br>Criteria<br>ug/l | Human<br>Health<br>Criteria<br>ug/l | Need<br>TMDL |
|-----------------------------------------------|------------|-------------------------------|--------------------------------|------------------------------|---------------|------------|--------------|------------|------------|--------|--------|--------------------------------------------|--------------------------------------|----------------------------------------|-------------------------------------|--------------|
|                                               |            | Ambient<br>Conc.<br>Ca (ug/l) | Effluent<br>Conc.<br>Ce (ug/l) | Acute                        | Domestic      | Chronic    | Human        | Domestic   | Irrigation |        |        |                                            |                                      |                                        |                                     |              |
|                                               |            |                               |                                | Aquatic                      | Supply        | Aquatic    | Health       | Criteria   | Criteria   |        |        |                                            |                                      |                                        |                                     |              |
|                                               |            | CAS No.                       | MQL                            | 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                                 | ug/l                                   | ug/l                                | ug/l         |
| <b>Radioactivity, Nutrients, and Chlorine</b> |            |                               |                                |                              |               |            |              |            |            |        |        |                                            |                                      |                                        |                                     |              |
| Aluminum, total                               | 7429-90-5  | 2.5                           | 1152                           | 3.22                         | 6.8586        | 1067.45529 | 1067.45529   | 1113.46225 | 1E+100     | 5000   | 1E+100 | 9264.622447                                | 3711.74868                           | 1E+100                                 | 1E+100                              | N/A          |
| Barium, dissolved                             | 7440-39-3  | 100                           | 30                             | 210                          | 447.3         | 60.8088648 | 60.8088648   | 44.043508  | 2000       | 1E+100 | 1E+100 | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Boron, dissolved                              | 7440-42-8  | 100                           | 4                              | 24                           | 51.12         | 7.47882509 | 7.47882509   | 5.58574191 | 1E+100     | 750    | 5000   | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Cobalt, dissolved                             | 7440-48-4  | 50                            |                                | 0.31                         | 0.6603        | 0.04874933 | 0.04874933   | 0.02222125 | 1E+100     | 50     | 1000   | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Uranium, dissolved                            | 7440-61-1  | 0.1                           | 1                              | 28                           | 59.64         | 5.3293358  | 5.3293358    | 2.97342753 | 30         | 1E+100 | 1E+100 | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Vanadium, dissolved                           | 7440-62-2  | 50                            |                                |                              | 0             | 0          | 0            | 0          | 1E+100     | 100    | 100    | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Ra-226 and Ra-228 (pCi/l)                     |            |                               |                                |                              | 0             | 0          | 0            | 0          | 5          | 1E+100 | 30     | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Strontium (pCi/l)                             |            |                               |                                |                              | 0             | 0          | 0            | 0          | 8          | 1E+100 | 1E+100 | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Tritium (pCi/l)                               |            |                               |                                |                              | 0             | 0          | 0            | 0          | 20000      | 1E+100 | 20000  | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Gross Alpha (pCi/l)                           |            |                               | 0                              | 30.5                         | 64.965        | 4.79630458 | 4.79630458   | 2.18628444 | 15         | 1E+100 | 15     | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Asbestos (fibers/l)                           |            |                               |                                |                              | 0             | 0          | 0            | 0          | 7000000    | 1E+100 | 1E+100 | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Total Residual Chlorine                       | 7782-50-5  | 33                            |                                |                              | 0             | 0          | 0            | 0          | 1E+100     | 1E+100 | 11     | 19                                         | 11                                   | 1E+100                                 | 1E+100                              | N/A          |
| Nitrate as N (mg/l)                           |            |                               |                                |                              | 0             | 0          | 0            | 0          | 10         | 1E+100 | 1E+100 | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Nitrite + Nitrate (mg/l)                      |            |                               |                                |                              | 0             | 0          | 0            | 0          | 1E+100     | 1E+100 | 132    | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| <b>METALS AND CYANIDE</b>                     |            |                               |                                |                              |               |            |              |            |            |        |        |                                            |                                      |                                        |                                     |              |
| Antimony, dissolved (P)                       | 7440-36-0  | 60                            |                                |                              | 0             | 0          | 0            | 0          | 6          | 1E+100 | 1E+100 | 1E+100                                     | 1E+100                               | 640                                    | 1E+100                              | N/A          |
| Arsenic, dissolved (P)                        | 7440-38-2  | 0.5                           | 0                              | 0.311438259                  | 0.663363492   | 0.0489755  | 0.0489755    | 0.02232435 | 10         | 100    | 200    | 340                                        | 150                                  | 9                                      | 1E+100                              | N/A          |
| Beryllium, dissolved                          | 7440-41-7  | 0.5                           |                                |                              | 0             | 0          | 0            | 0          | 4          | 1E+100 | 1E+100 | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Cadmium, dissolved                            | 7440-43-9  | 1                             | 0.0499                         | 0.0193                       | 0.041109      | 0.04925097 | 0.04925097   | 0.04960415 | 5          | 10     | 50     | 3.071229171                                | 0.76373144                           | 1E+100                                 | 1E+100                              | N/A          |
| Chromium (III), dissolved                     | 16065-83-1 | 10                            |                                |                              | 0             | 0          | 0            | 0          | 1E+100     | 1E+100 | 1E+100 | 1033.889958                                | 134.487842                           | 1E+100                                 | 1E+100                              | N/A          |
| Chromium (VI), dissolved                      | 18540-29-9 | 10                            |                                |                              | 0             | 0          | 0            | 0          | 1E+100     | 1E+100 | 1E+100 | 16                                         | 11                                   | 1E+100                                 | 1E+100                              | N/A          |
| Chromium, dissolved                           | 7440-47-3  |                               |                                |                              | 0             | 0          | 0            | 0          | 100        | 100    | 1000   | 1E+100                                     | 1E+100                               | 1E+100                                 | 1E+100                              | N/A          |
| Copper, dissolved                             | 7440-50-8  | 0.5                           | 0                              | 0.110445136                  | 0.23524814    | 0.01736815 | 0.01736815   | 0.00791687 | 1300       | 200    | 500    | 26.67336902                                | 16.6762611                           | 1E+100                                 | 1E+100                              | N/A          |
| Lead, dissolved                               | 7439-92-1  | 0.5                           | 0                              | 0.002883654                  | 0.006142184   | 0.00045347 | 0.00045347   | 0.0002067  | 15         | 5000   | 100    | 141.2029685                                | 5.50247697                           | 1E+100                                 | 1E+100                              | N/A          |
| Manganese, dissolved                          | 7439-96-5  |                               | 290                            | 343                          | 730.59        | 322.528343 | 322.528343   | 304.827293 | 1E+100     | 1E+100 | 1E+100 | 3804.457293                                | 2101.96653                           | 1E+100                                 | 1E+100                              | N/A          |

| POLLUTANTS                    | CAS No.   | MQL     | Instream Waste Concentration |             |             |               |            |              |          |            | Livestock& | Acute       | Chronic    | Human    | Need |
|-------------------------------|-----------|---------|------------------------------|-------------|-------------|---------------|------------|--------------|----------|------------|------------|-------------|------------|----------|------|
|                               |           |         | Ambient                      | Effluent    | Acute       | Domestic      | Chronic    | Human        | Domestic | Irrigation | Wildlife   | Aquatic     | Aquatic    | Health   | TMDL |
|                               |           |         | Conc                         | Conc.       | Aquatic     | Supply        | Aquatic    | Health       | Criteria | 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           | 0             | 0          | 0            | 1E+100   | 1E+100     | 1E+100     | 1.4         | 0.77       | 1E+100   | N/A  |
| Mercury, total                | 7439-97-6 | 0.005   | 0                            | 0.003       | 0.00639     | 0.00047177    | 0.00047177 | 0.00021504   | 2        | 1E+100     | 0.77       | 1E+100      | 1E+100     | 1E+100   | N/A  |
| Molybdenum, dissolved         | 7439-98-7 |         | 3.8                          | 1630        | 3471.9      | 259.846547    | 259.846547 | 120.512893   | 1E+100   | 1000       | 1E+100     | 1E+100      | 1E+100     | 1E+100   | N/A  |
| Molybdenum, total recoverable | 7439-98-7 |         | 3.8                          | 1630        | 3471.9      | 259.846547    | 259.846547 | 120.512893   | 1E+100   | 1E+100     | 1E+100     | 7920        | 1895       | 1E+100   | N/A  |
| Nickel, dissolved (P)         | 7440-02-0 | 0.5     | 39                           | 0.249406165 | 0.531235131 | 36.1598874    | 36.1598874 | 37.7054004   | 700      | 1E+100     | 1E+100     | 866.5138531 | 96.2429371 | 4600     | N/A  |
| Selenium, dissolved (P)       | 7782-49-2 | 5       |                              |             | 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           | 0           | 0             | 0          | 0            | 1E+100   | 1E+100     | 1E+100     | 11.24313134 | 1E+100     | 1E+100   | N/A  |
| Thallium, dissolved (P)       | 7440-28-0 | 0.5     |                              |             | 0           | 0             | 0          | 0            | 2        | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 0.47     | N/A  |
| Zinc, dissolved               | 7440-66-6 | 20      | 64                           | 0.240358765 | 0.51196417  | 59.3127383    | 59.3127383 | 61.8634202   | 10500    | 2000       | 25000      | 310.0795451 | 234.944387 | 26000    | N/A  |
| Cyanide, total recoverable    | 57-12-5   | 10      |                              | 5           | 10.65       | 0.78627944    | 0.78627944 | 0.35840729   | 200      | 1E+100     | 5.2        | 22          | 5.2        | 140      | N/A  |
| Dioxin                        | 1764-01-6 | 0.00001 |                              |             | 0           | 0             | 0          | 0            | 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            | 18       | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 9        | N/A  |
| Acrylonitrile                 | 107-13-0  | 20      |                              |             | 0           | 0             | 0          | 0            | 0.65     | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 2.5      | N/A  |
| Benzene                       | 71-43-2   | 10      |                              |             | 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            | 44       | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 1400     | N/A  |
| Carbon Tetrachloride          | 56-23-5   | 2       |                              |             | 0           | 0             | 0          | 0            | 5        | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 16       | N/A  |
| Chlorobenzene                 | 108-90-7  | 10      |                              |             | 0           | 0             | 0          | 0            | 100      | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 1600     | N/A  |
| Clorodibromomethane           | 124-48-1  | 10      |                              |             | 0           | 0             | 0          | 0            | 4.2      | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 130      | N/A  |
| Chloroform                    | 67-66-3   | 50      |                              |             | 0           | 0             | 0          | 0            | 57       | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 4700     | N/A  |
| Dichlorobromomethane          | 75-27-4   | 10      |                              |             | 0           | 0             | 0          | 0            | 5.6      | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 170      | N/A  |
| 1,2-Dichloroethane            | 107-06-2  | 10      |                              |             | 0           | 0             | 0          | 0            | 5        | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 370      | N/A  |
| 1,1-Dichloroethylene          | 75-35-4   | 10      |                              |             | 0           | 0             | 0          | 0            | 7        | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 7100     | N/A  |
| 1,2-Dichloropropane           | 78-87-5   | 10      |                              |             | 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            | 3.5      | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 210      | N/A  |
| Ethylbenzene                  | 100-41-4  | 10      |                              |             | 0           | 0             | 0          | 0            | 700      | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 2100     | N/A  |
| Methyl Bromide                | 74-83-9   | 50      |                              |             | 0           | 0             | 0          | 0            | 49       | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 1500     | N/A  |
| Methylene Chloride            | 75-09-2   | 20      |                              |             | 0           | 0             | 0          | 0            | 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            | 1.8      | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 40       | N/A  |
| Tetrachloroethylene           | 127-18-4  | 10      |                              |             | 0           | 0             | 0          | 0            | 5        | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 33       | N/A  |
| Toluene                       | 108-88-3  | 10      |                              |             | 0           | 0             | 0          | 0            | 1000     | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 15000    | N/A  |
| 1,2-trans-Dichloroethylene    | 156-60-5  | 10      |                              |             | 0           | 0             | 0          | 0            | 100      | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 10000    | N/A  |
| 1,1,1-Trichloroethane         | 71-55-6   |         |                              |             | 0           | 0             | 0          | 0            | 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            | 5        | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 160      | N/A  |
| Trichloroethylene             | 79-01-6   | 10      |                              |             | 0           | 0             | 0          | 0            | 5        | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 300      | N/A  |
| Vinyl Chloride                | 75-01-4   | 10      |                              |             | 0           | 0             | 0          | 0            | 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            | 175      | 1E+100     | 1E+100     | 1E+100      | 1E+100     | 150      | N/A  |
| 2,4-Dichlorophenol            | 120-83-2  | 10      |                              |             | 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            | 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 |           |         |               |           |              |          |            | Livestock& | Acute    | Chronic  | Human    | Need |
|-----------------------------|------------|-----|------------------------------|-----------|---------|---------------|-----------|--------------|----------|------------|------------|----------|----------|----------|------|
|                             |            |     | Ambient                      | Effluent  | Acute   | Domestic      | Chronic   | Human        | Domestic | Irrigation | Wildlife   | Acute    | Chronic  | Human    | Need |
|                             |            |     | Conc                         | Conc.     | Aquatic | Supply        | Aquatic   | Health       | Criteria | Criteria   | Criteria   | Criteria | Criteria | Criteria | TMDL |
|                             |            |     | 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            | 70       | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 5300     | N/A  |
| Pentachlorophenol           | 87-86-5    | 50  |                              |           | 0       | 0             | 0         | 0            | 1        | 1E+100     | 1E+100     | 19       | 15       | 30       | N/A  |
| Phenol                      | 108-95-2   | 10  |                              |           | 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            | 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            | 2100     | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 990      | N/A  |
| Anthracene                  | 120-12-7   | 10  |                              |           | 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            | 0.0015   | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.002    | N/A  |
| Benzo(a)anthracene          | 56-55-3    | 5   |                              |           | 0       | 0             | 0         | 0            | 0.048    | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.18     | N/A  |
| Benzo(a)pyrene              | 50-32-8    | 5   |                              |           | 0       | 0             | 0         | 0            | 0.2      | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.18     | N/A  |
| 3,4-Benzofluoranthene       | 205-99-2   | 10  |                              |           | 0       | 0             | 0         | 0            | 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            | 0.048    | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.18     | N/A  |
| Bis(2-chloroethyl)Ether     | 111-44-4   | 10  |                              |           | 0       | 0             | 0         | 0            | 0.3      | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 5.3      | N/A  |
| Bis(2-chloroisopropyl)Ether | 108-60-1   | 10  |                              |           | 0       | 0             | 0         | 0            | 1400     | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 65000    | N/A  |
| Bis(2-ethylhexyl)Phthalate  | 117-81-7   | 10  |                              |           | 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            | 7000     | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 1900     | N/A  |
| 2-Chloronaphthalene         | 91-58-7    | 10  |                              |           | 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            | 0.048    | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.18     | N/A  |
| Dibenzo(a,h)anthracene      | 53-70-3    | 5   |                              |           | 0       | 0             | 0         | 0            | 0.048    | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.18     | N/A  |
| 1,2-Dichlorobenzene         | 95-50-1    | 10  |                              |           | 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            | 469      | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 960      | N/A  |
| 1,4-Dichlorobenzene         | 106-46-7   | 10  |                              |           | 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            | 0.78     | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.28     | N/A  |
| Diethyl Phthalate           | 84-66-2    | 10  |                              |           | 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            | 350000   | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 1100000  | N/A  |
| Di-n-Butyl Phthalate        | 84-74-2    | 10  |                              |           | 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            | 1.1      | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 34       | N/A  |
| 1,2-Diphenylhydrazine       | 122-66-7   | 20  |                              |           | 0       | 0             | 0         | 0            | 0.44     | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 2        | N/A  |
| Fluoranthene                | 206-44-0   | 10  |                              |           | 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            | 1400     | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 5300     | N/A  |
| Hexachlorobenzene           | 118-74-1   | 5   |                              |           | 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            | 4.5      | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 180      | N/A  |
| Hexachlorocyclopentadiene   | 77-47-4    | 10  |                              |           | 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            | 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            | 0.048    | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.18     | N/A  |
| Isophorone                  | 78-59-1    | 10  |                              |           | 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            | 18       | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 690      | N/A  |
| n-Nitrosodimethylamine      | 62-75-9    | 50  |                              |           | 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            | 0.05     | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 5.1      | N/A  |
| n-Nitrosodiphenylamine      | 86-30-6    | 20  |                              |           | 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            | 1050     | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 4000     | N/A  |
| 1,2,4-Trichlorobenzene      | 120-82-1   | 10  |                              |           | 0       | 0             | 0         | 0            | 70       | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 70       | N/A  |

| POLLUTANTS                 | CAS No.    | MQL  | Instream Waste Concentration |           |         |               |           |              |          |            | Livestock& | Acute    | Chronic  | Human    | Need |
|----------------------------|------------|------|------------------------------|-----------|---------|---------------|-----------|--------------|----------|------------|------------|----------|----------|----------|------|
|                            |            |      | Ambient                      | Effluent  | Acute   | Domestic      | Chronic   | Human        | Domestic | Irrigation | Wildlife   | Aquatic  | Aquatic  | Health   | TMDL |
|                            |            |      | Conc                         | Conc.     | Aquatic | Supply        | Aquatic   | Health       | Criteria | 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     |      |
| <b>PESTICIDES AND PCBS</b> |            |      |                              |           |         |               |           |              |          |            |            |          |          |          |      |
| Aldrin                     | 309-00-2   | 0.01 |                              |           | 0       | 0             | 0         | 0            | 0.021    | 1E+100     | 1E+100     | 3        | 1E+100   | 0.0005   | N/A  |
| Alpha-BHC                  | 319-84-6   | 0.05 |                              |           | 0       | 0             | 0         | 0            | 0.056    | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.049    | N/A  |
| Beta-BHC                   | 319-85-7   | 0.05 |                              |           | 0       | 0             | 0         | 0            | 0.091    | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 0.17     | N/A  |
| Gamma-BHC                  | 58-89-9    | 0.05 |                              |           | 0       | 0             | 0         | 0            | 0.2      | 1E+100     | 1E+100     | 0.95     | 1E+100   | 1.8      | N/A  |
| Chlordane                  | 57-74-9    | 0.2  |                              |           | 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            | 1        | 1E+100     | 0.001      | 1.1      | 0.001    | 0.0022   | N/A  |
| Dieldrin                   | 60-57-1    | 0.02 |                              |           | 0       | 0             | 0         | 0            | 0.022    | 1E+100     | 1E+100     | 0.24     | 0.056    | 0.00054  | N/A  |
| Diazinon                   | 333-41-5   |      |                              |           | 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             | 0         | 0            | 62       | 1E+100     | 1E+100     | 0.22     | 0.056    | 89       | N/A  |
| Beta-Endosulfan            | 33213-65-9 | 0.02 |                              |           | 0       | 0             | 0         | 0            | 62       | 1E+100     | 1E+100     | 0.22     | 0.056    | 89       | N/A  |
| Endosulfan sulfate         | 1031-7-8   | 0.1  |                              |           | 0       | 0             | 0         | 0            | 62       | 1E+100     | 1E+100     | 1E+100   | 1E+100   | 89       | N/A  |
| Endrin                     | 72-20-8    | 0.02 |                              |           | 0       | 0             | 0         | 0            | 2        | 1E+100     | 1E+100     | 0.086    | 0.036    | 0.06     | N/A  |
| Endrin Aldehyde            | 7421-93-4  | 0.1  |                              |           | 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             | 0         | 0            | 0.4      | 1E+100     | 1E+100     | 0.52     | 0.0038   | 0.00079  | N/A  |
| Heptachlor Epoxide         | 1024-57-3  | 0.01 |                              |           | 0       | 0             | 0         | 0            | 0.2      | 1E+100     | 1E+100     | 0.52     | 0.0038   | 0.00039  | N/A  |
| PCBs                       | 1336-36-3  | 0.2  |                              |           | 0       | 0             | 0         | 0            | 0.5      | 1E+100     | 0.014      | 2        | 0.014    | 0.00064  | N/A  |
| Toxaphene                  | 8001-35-2  | 0.3  |                              |           | 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





