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

NMAC 20.6.4. 2005 Do not change this year

Calculations Specifications:

Excel

Revised as of September 14, 2009

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

**APPENDIX 1  
 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 "Procedures for Implementing NPDES Permits in New Mexico" amended November 2010

| FACILITY                  | DATA INPUT     |   |
|---------------------------|----------------|---|
| Permittee                 | CITY OF GALLUP |   |
| NPDES Permit No.          | NM0020672      |   |
| Outfall No.(s)            | 001            |   |
| Plant Effluent Flow (MGD) | 3.5            | For industrial and federal facility, use the highest monthly average flow for the past 24 months. For POTWs, use the design flow. |
| Plant Effluent Flow (cfs) | 5.425          |   |

| RECEIVING STREAM   | DATA INPUT             |  |
|--|------------------------|--|
| Receiving Stream Name  | RIO PUERCO of the WEST |  |
| Basin Name   | CRB                    |  |
| Waterbody Segment Code No.   | Undesignated           |  |
| 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)                                 | 0                      |  |
| Livestock watering and wildlife habitat criteria applied to all streams                        |                        |  |
| USGS Flow Station  | N/A                    |  |
| WQ Monitoring Station No.  | N/A                    |  |
| Receiving Stream TSS (mg/l)  | 6                      | For intermittent stream, enter effluent TSS                                      |
| Receiving Stream Hardness (mg/l as CaCO <sub>3</sub> )   | 90                     | For intermittent stream, enter effluent Hardness (If no data, 20 mg/l is used)   |
| Receiving Stream Critical Low Flow (4Q3) (cfs)   | 0                      | Enter "0" for intermittent stream and lake.                                      |
| Receiving Stream Harmonic Mean Flow (cfs)  | 0                      | Enter harmonic mean or modified harmonic mean flow data                          |
| Avg. Water Temperature (C)   | 16                     |  |
| pH (Avg)   | 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  | 0                      |  |

**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 "Procedures for Implementing NPDES Permits in New Mexico" amended July 2009

$$C_d = [(F \cdot Q_a \cdot C_a) + (Q_e \cdot 2.13 \cdot C_e)] / (F \cdot Q_a + Q_e)$$

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 "Procedures for Implementing NPDES Permits in New Mexico" amended July 2009

$$K_p = K_{po} \cdot (TSS)^a$$

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

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

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

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

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      | 2           | 480000                              | -0.73     | 129774.9364 | 0.562224279 | 1.12444856                | 480000                            | -0.73     | 129774.9364 | 0.562224279 | 1.1244486               |
| Chromium     | 0           | 3360000                             | -0.93     | 634831.7141 | 0.207943859 | 0                         | 2170000                           | -0.27     | 1337700.521 | 0.110788555 | 0                       |
| Copper       | 24          | 1040000                             | -0.74     | 276185.8434 | 0.376348023 | 9.03235255                | 2850000                           | -0.9      | 568209.8195 | 0.226795482 | 5.4430916               |
| Lead         | 0           | 2800000                             | -0.8      | 667785.5712 | 0.199731823 | 0                         | 2040000                           | -0.53     | 789241.6661 | 0.174354236 | 0                       |
| Nickel       | 0           | 490000                              | -0.57     | 176461.4597 | 0.485727208 | 0                         | 2210000                           | -0.76     | 566235.7993 | 0.227406339 | 0                       |
| Silver       | 0           | 2390000                             | -1.03     | 377487.0984 | 0.306285975 | 0                         | 2390000                           | -1.03     | 377487.0984 | 0.306285975 | 0                       |
| Zinc         | 138         | 1250000                             | -0.7      | 356618.7207 | 0.318500517 | 43.9530714                | 3340000                           | -0.68     | 987651.2473 | 0.144385411 | 19.925187               |

The following formula is used to calculate hardness dependent criteria

(Please refer to State Water Quality Standards for details)

|              |         |  | Dissolved<br>WQC (ug/l) |  |
|--------------|---------|--|-------------------------|--|
| Cadmium (D)  | Acute   | $e^{(1.0166[\ln(\text{hardness})]-3.924)} \cdot CF1$   | 1.817636511             | $CF1 = 1.136672 - 0.041838 \cdot \ln(\text{hardness})$ |
|              | Chronic | $e^{(0.7409[\ln(\text{hardness})]-4.719)} \cdot CF2$   | 0.228627193             | $CF2 = 1.101672 - 0.041838 \cdot \ln(\text{hardness})$ |
| Chromium (D) | Acute   | $0.316 \cdot e^{(0.819[\ln(\text{hardness})]+3.7256)}$ | 522.6599465             |  |
|              | Chronic | $0.860 \cdot e^{(0.819[\ln(\text{hardness})]+0.6848)}$ | 67.98732089             |  |

|            |         |   | Dissolved<br>WQC (ug/l) |   |
|------------|---------|---|-------------------------|---|
| Copper (D) | Acute   | $0.960 e(0.9422[\ln(\text{hardness})]-1.700)$ | 12.16908448             |   |
|            | Chronic | $0.960 e(0.8545[\ln(\text{hardness})]-1.702)$ | 8.184690269             |   |
| Lead (D)   | Acute   | $e(1.273[\ln(\text{hardness})]-1.46)*CF3$     | 57.5713445              | $CF3 = 1.46203 - 0.145712*\ln(\text{hardness})$ |
|            | Chronic | $e(1.273[\ln(\text{hardness})]-4.705)*CF4$    | 2.243472643             | $CF4 = 1.46203 - 0.145712*\ln(\text{hardness})$ |
| Nickel (D) | Acute   | $0.998 e(0.846[\ln(\text{hardness})]+2.255)$  | 428.3056081             |   |
|            | Chronic | $0.997 e(0.846[\ln(\text{hardness})]+0.0584)$ | 47.57152995             |   |
| Zinc (D)   | Acute   | $0.978 e(0.8473[\ln(\text{hardness})]+0.884)$ | 107.1728686             |   |
|            | Chronic | $0.986 e(0.8473[\ln(\text{hardness})]+0.884)$ | 108.0495382             |   |
| Silver (D) | Acute   | $0.85 e(1.72[\ln(\text{hardness})]-6.59)$     | 2.683585312             |   |

| POLLUTANTS                                    | Instream Waste Concentration |                   |                  |                    |                    |                 |                      |                        |              |         |        | Livestock&<br>Wildlife<br>Criteria | Acute<br>Aquatic<br>Criteria | Chronic<br>Aquatic<br>Criteria | Human<br>Health<br>Criteria |      |
|---|------------------------------|-------------------|------------------|--------------------|--------------------|-----------------|----------------------|------------------------|--------------|---------|--------|------------------------------------|------------------------------|--------------------------------|-----------------------------|------|
|   | Ambient<br>Conc.             | Effluent<br>Conc. | Acute<br>Aquatic | Domestic<br>Supply | Chronic<br>Aquatic | Human<br>Health | Domestic<br>Criteria | Irrigation<br>Criteria |              |         |        |                                    |                              |                                |                             |      |
|   | CAS No.                      | STORET            | MLQ              | 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 |
| <b>Radioactivity, Nutrients, and Chlorine</b> |                              |                   |                  |                    |                    |                 |                      |                        |              |         |        |                                    |                              |                                |                             |      |
| Aluminum, dissolved                           | 7429-90-5                    | 01106             | 2.5              | 5                  | 10.65              | 10.65           | 10.65                | 10.65                  | 10.65        | 1E+100  | 5000   | 1E+100                             | 750                          | 87                             | 1E+100                      |      |
| Barium, dissolved                             | 7440-39-3                    | 01005             | 100              |                    | 0                  | 0               | 0                    | 0                      | 0            | 2000    | 1E+100 | 1E+100                             | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Boron, dissolved                              | 7440-42-8                    | 01022             | 100              |                    | 0                  | 0               | 0                    | 0                      | 0            | 1E+100  | 750    | 5000                               | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Cobalt, dissolved                             | 7440-48-4                    | 01037             | 50               |                    | 0                  | 0               | 0                    | 0                      | 0            | 1E+100  | 50     | 1000                               | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Molybdenum, dissolved                         | 7439-98-7                    | 01062             | 10               |                    | 0                  | 0               | 0                    | 0                      | 0            | 1E+100  | 1000   | 1E+100                             | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Uranium, dissolved                            | 7440-61-1                    | 22706             | 0.1              |                    | 0                  | 0               | 0                    | 0                      | 0            | 5000    | 1E+100 | 1E+100                             | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Vanadium, dissolved                           | 7440-62-2                    | 01087             | 50               |                    | 0                  | 0               | 0                    | 0                      | 0            | 1E+100  | 100    | 100                                | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Ra-226 and Ra-228 (pCi/l)                     |                              | 11503             |                  |                    | 0                  | 0               | 0                    | 0                      | 0            | 5       | 1E+100 | 30                                 | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Strontium (pCi/l)                             |                              | 13501             |                  |                    | 0                  | 0               | 0                    | 0                      | 0            | 8       | 1E+100 | 1E+100                             | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Tritium (pCi/l)                               |                              | 04124             |                  |                    | 0                  | 0               | 0                    | 0                      | 0            | 20000   | 1E+100 | 20000                              | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Gross Alpha (pCi/l)                           |                              | 80029             |                  |                    | 0                  | 0               | 0                    | 0                      | 0            | 15      | 1E+100 | 15                                 | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Asbestos (fibers/l)                           |                              |                   |                  |                    | 0                  | 0               | 0                    | 0                      | 0            | 7000000 | 1E+100 | 1E+100                             | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Total Residual Chlorine                       | 7782-50-5                    | 50060             | 33               |                    | 0                  | 0               | 0                    | 0                      | 0            | 1E+100  | 1E+100 | 11                                 | 19                           | 11                             | 1E+100                      |      |
| Nitrate as N (mg/l)                           |                              | 00620             |                  |                    | 0                  | 0               | 0                    | 0                      | 0            | 10      | 1E+100 | 1E+100                             | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Nitrite + Nitrate (mg/l)                      |                              | 00630             |                  |                    | 0                  | 0               | 0                    | 0                      | 0            | 1E+100  | 1E+100 | 132                                | 1E+100                       | 1E+100                         | 1E+100                      |      |
| <b>METALS AND CYANIDE</b>                     |                              |                   |                  |                    |                    |                 |                      |                        |              |         |        |                                    |                              |                                |                             |      |
| Antimony, dissolved (P)                       | 7440-36-0                    | 01097             | 60               |                    | 0                  | 0               | 0                    | 0                      | 0            | 5.6     | 1E+100 | 1E+100                             | 1E+100                       | 1E+100                         | 640                         |      |
| Arsenic, dissolved (P)                        | 7440-38-2                    | 01000             | 0.5              | 1.124448559        | 2.39507543         | 2.39507543      | 2.39507543           | 2.39507543             | 2.39507543   | 2.3     | 100    | 200                                | 340                          | 150                            | 9                           |      |
| Beryllium, dissolved                          | 7440-41-7                    | 01012             | 0.5              |                    | 0                  | 0               | 0                    | 0                      | 0            | 4       | 1E+100 | 1E+100                             | 1E+100                       | 1E+100                         | 1E+100                      |      |
| Cadmium, dissolved                            | 7440-43-9                    | 01025             | 1                |                    | 0                  | 0               | 0                    | 0                      | 0            | 5       | 10     | 50                                 | 1.8176365                    | 0.22862719                     | 1E+100                      |      |
| Chromium, dissolved                           | 18540-29-9                   | 01034             | 10               |                    | 0                  | 0               | 0                    | 0                      | 0            | 100     | 100    | 1000                               | 522.65995                    | 67.9873209                     | 1E+100                      |      |
| Copper, dissolved                             | 7440-50-8                    | 01042             | 0.5              | 9.032352552        | 19.2389109         | 19.2389109      | 19.2389109           | 19.2389109             | 19.23891094  | 1300    | 200    | 500                                | 12.169084                    | 8.18469027                     | 1E+100                      |      |
| Lead, dissolved                               | 7439-92-1                    | 01049             | 0.5              | 0                  | 0                  | 0               | 0                    | 0                      | 0            | 50      | 5000   | 100                                | 57.571345                    | 2.24347264                     | 1E+100                      |      |
| Mercury, dissolved                            | 7439-97-6                    | 71890             | 0.005            |                    | 0                  | 0               | 0                    | 0                      | 0            | 1E+100  | 1E+100 | 1E+100                             | 1.4                          | 0.77                           | 1E+100                      |      |

| POLLUTANTS                    | CAS No.   | STORET | MQL     | Instream Waste Concentration |             |            |               |            |              |            | Livestock& | Acute    | Chronic   | Human      |             |
|-------------------------------|-----------|--------|---------|------------------------------|-------------|------------|---------------|------------|--------------|------------|------------|----------|-----------|------------|-------------|
|                               |           |        |         | Ambient                      | Effluent    | Acute      | Domestic      | Chronic    | Human        | Domestic   | Irrigation | Wildlife | Aquatic   | Aquatic    | Health      |
|                               |           |        |         | 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, total                | 7439-97-6 | 71900  | 0.005   |                              |             | 0          | 0             | 0          | 0            | 2          | 1E+100     | 0.77     | 1E+100    | 1E+100     | 1E+100      |
| Nickel, dissolved (P)         | 7440-02-0 | 01065  | 0.5     |                              | 0           | 0          | 0             | 0          | 0            | 100        | 1E+100     | 1E+100   | 428.30561 | 47.57153   | 4600        |
| Selenium, dissolved (P)       | 7782-49-2 | 01145  | 5       |                              |             | 0          | 0             | 0          | 0            | 50         | 130        | 50       | 1E+100    | 1E+100     | 4200        |
| Selenium, dis (SO4 >500 mg/l) |           | 01145  | 5       |                              |             | 0          | 0             | 0          | 0            | 50         | 250        | 50       | 1E+100    | 1E+100     | 4200        |
| Selenium, total recoverable   | 7782-49-2 | 01147  | 5       |                              |             | 0          | 0             | 0          | 0            | 1E+100     | 1E+100     | 5        | 20        | 5          | 1E+100      |
| Silver, dissolved             | 7440-22-4 | 01077  | 0.5     |                              | 0           | 0          | 0             | 0          | 0            | 1E+100     | 1E+100     | 1E+100   | 2.6835853 | 1E+100     | 1E+100      |
| Thallium, dissolved (P)       | 7440-28-0 | 01059  | 0.5     |                              |             | 0          | 0             | 0          | 0            | 1.7        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 6.3         |
| Zinc, Dis.                    | 7440-66-6 | 01080  | 20      |                              | 43.95307141 | 93.6200421 | 93.6200421    | 93.6200421 | 93.62004211  | 7400       | 2000       | 25000    | 107.17287 | 108.049538 | 26000       |
| Cyanide, dissolved            | 57-12-5   | 00720  | 10      |                              |             | 0          | 0             | 0          | 0            | 200        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 1E+100      |
| Cyanide, weak acid dissocial  | 57-12-5   | 00718  | 10      |                              |             | 0          | 0             | 0          | 0            | 700        | 1E+100     | 5.2      | 22        | 5.2        | 220000      |
| <b>DIOXIN</b>                 |           |        |         |                              |             | 0          | 0             | 0          | 0            |            |            |          |           |            |             |
| 2,3,7,8-TCDD                  | 1764-01-6 | 34675  | 0.00001 |                              |             | 0          | 0             | 0          | 0            | 0.00000005 | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 0.000000051 |
| <b>VOLATILE COMPOUNDS</b>     |           |        |         |                              |             |            |               |            |              |            |            |          |           |            |             |
| Acrolein                      | 107-02-8  | 34210  | 50      |                              |             | 0          | 0             | 0          | 0            | 190        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 290         |
| Acrylonitrile                 | 107-13-0  | 34215  | 20      |                              |             | 0          | 0             | 0          | 0            | 0.51       | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 2.5         |
| Benzene                       | 71-43-2   | 34030  | 10      |                              |             | 0          | 0             | 0          | 0            | 22         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 510         |
| Bromoform                     | 75-25-2   | 32104  | 10      |                              |             | 0          | 0             | 0          | 0            | 43         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 1400        |
| Carbon Tetrachloride          | 56-23-5   | 32102  | 2       |                              |             | 0          | 0             | 0          | 0            | 2.3        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 16          |
| Chlorobenzene                 | 108-90-7  | 34301  | 10      |                              |             | 0          | 0             | 0          | 0            | 680        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 21000       |
| Clorodibromomethane           | 124-48-1  | 32105  | 10      |                              |             | 0          | 0             | 0          | 0            | 4          | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 130         |
| Chloroform                    | 67-66-3   | 32106  | 50      |                              |             | 0          | 0             | 0          | 0            | 57         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 4700        |
| Dichlorobromomethane          | 75-27-4   | 32101  | 10      |                              |             | 0          | 0             | 0          | 0            | 5.5        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 170         |
| 1,2-Dichloroethane            | 107-06-2  | 34531  | 10      |                              |             | 0          | 0             | 0          | 0            | 3.8        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 370         |
| 1,1-Dichloroethylene          | 75-35-4   | 34501  | 10      |                              |             | 0          | 0             | 0          | 0            | 0.57       | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 32          |
| 1,2-Dichloropropane           | 78-87-5   | 34541  | 10      |                              |             | 0          | 0             | 0          | 0            | 5          | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 150         |
| 1,3-Dichloropropylene         | 542-75-6  | 34561  | 10      |                              |             | 0          | 0             | 0          | 0            | 10         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 1700        |
| Ethylbenzene                  | 100-41-4  | 34371  | 10      |                              |             | 0          | 0             | 0          | 0            | 3100       | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 29000       |
| Methyl Bromide                | 74-83-9   | 34413  | 50      |                              |             | 0          | 0             | 0          | 0            | 47         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 1500        |
| Methylene Chloride            | 75-09-2   | 34423  | 20      |                              |             | 0          | 0             | 0          | 0            | 46         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 5900        |
| 1,1,2,2-Tetrachloroethane     | 79-34-5   | 34516  | 10      |                              |             | 0          | 0             | 0          | 0            | 1.7        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 40          |
| Tetrachloroethylene           | 127-18-4  | 34475  | 10      |                              |             | 0          | 0             | 0          | 0            | 6.9        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 33          |
| Toluene                       | 108-88-3  | 34010  | 10      |                              |             | 0          | 0             | 0          | 0            | 6800       | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 200000      |
| 1,2--trans-Dichloroethylene   | 156-60-5  | 34546  | 10      |                              |             | 0          | 0             | 0          | 0            | 700        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 140000      |
| 1,1,2-Trichloroethane         | 79-00-5   | 34511  | 10      |                              |             | 0          | 0             | 0          | 0            | 5.9        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 160         |
| Trichloroethylene             | 79-01-6   | 39180  | 10      |                              |             | 0          | 0             | 0          | 0            | 25         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 300         |
| Vinyl Chloride                | 75-01-4   | 39175  | 10      |                              |             | 0          | 0             | 0          | 0            | 20         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 5300        |
| <b>ACID COMPOUNDS</b>         |           |        |         |                              |             |            |               |            |              |            |            |          |           |            |             |
| 2-Chlorophenol                | 95-57-8   | 34586  | 10      |                              |             | 0          | 0             | 0          | 0            | 81         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 150         |
| 2,4-Dichlorophenol            | 120-83-2  | 34601  | 10      |                              |             | 0          | 0             | 0          | 0            | 77         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 290         |
| 2,4-Dimethylphenol            | 105-67-9  | 34606  | 10      |                              |             | 0          | 0             | 0          | 0            | 380        | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 850         |
| 4,6-Dinitro-o-Cresol          | 534-52-1  | 34657  | 50      |                              |             | 0          | 0             | 0          | 0            | 13         | 1E+100     | 1E+100   | 1E+100    | 1E+100     | 280         |

| POLLUTANTS                  | CAS No.  | STORET | MQL | Instream Waste Concentration |           |         |               |           |              |          | Livestock& | Acute    | Chronic  | Human    |          |
|-----------------------------|----------|--------|-----|------------------------------|-----------|---------|---------------|-----------|--------------|----------|------------|----------|----------|----------|----------|
|                             |          |        |     | Ambient                      | Effluent  | Acute   | Domestic      | Chronic   | Human        | Domestic | Irrigation | Wildlife | Aquatic  | Aquatic  | Health   |
|                             |          |        |     | 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     |
| 2,4-Dinitrophenol           | 51-28-5  | 34616  | 50  |                              |           | 0       | 0             | 0         | 0            | 69       | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 5300     |
| Pentachlorophenol           | 87-86-5  | 39032  | 50  |                              |           | 0       | 0             | 0         | 0            | 2.7      | 1E+100     | 1E+100   | 19       | 15       | 30       |
| Phenol                      | 108-95-2 | 34694  | 10  |                              |           | 0       | 0             | 0         | 0            | 21000    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 1700000  |
| 2,4,6-Trichlorophenol       | 88-06-2  | 34621  | 10  |                              |           | 0       | 0             | 0         | 0            | 14       | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 24       |
| <b>BASE/NEUTRAL</b>         |          |        |     |                              |           |         | 0             | 0         | 0            |          |            |          |          |          |          |
| Acenaphthene                | 83-32-9  | 34205  | 10  |                              |           | 0       | 0             | 0         | 0            | 670      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 990      |
| Anthracene                  | 120-12-7 | 34220  | 10  |                              |           | 0       | 0             | 0         | 0            | 8300     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 40000    |
| Benzidine                   | 92-87-5  | 39120  | 50  |                              |           | 0       | 0             | 0         | 0            | 0.00086  | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.002    |
| Benzo(a)anthracene          | 56-55-3  | 34526  | 5   |                              |           | 0       | 0             | 0         | 0            | 0.038    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.18     |
| Benzo(a)pyrene              | 50-32-8  | 34247  | 5   |                              |           | 0       | 0             | 0         | 0            | 0.038    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.18     |
| 3,4-Benzofluoranthene       | 205-99-2 | 34230  | 10  |                              |           | 0       | 0             | 0         | 0            | 0.038    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.18     |
| Benzo(k)fluoranthene        | 207-08-9 | 34242  | 5   |                              |           | 0       | 0             | 0         | 0            | 0.038    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.18     |
| Bis(2-chloroethyl)Ether     | 111-44-4 | 34273  | 10  |                              |           | 0       | 0             | 0         | 0            | 0.3      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 5.3      |
| Bis(2-chloroisopropyl)Ether | 108-60-1 | 34283  | 10  |                              |           | 0       | 0             | 0         | 0            | 1400     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 65000    |
| Bis(2-ethylhexyl)Phthalate  | 117-81-7 | 39100  | 10  |                              |           | 0       | 0             | 0         | 0            | 12       | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 22       |
| Butyl Benzyl Phthalate      | 85-68-7  | 34292  | 10  |                              |           | 0       | 0             | 0         | 0            | 1500     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 1900     |
| 2-Chloronaphthalene         | 91-58-7  | 34581  | 10  |                              |           | 0       | 0             | 0         | 0            | 1000     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 1600     |
| Chrysene                    | 218-01-9 | 34320  | 5   |                              |           | 0       | 0             | 0         | 0            | 0.038    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.18     |
| Dibenzo(a,h)anthracene      | 53-70-3  | 34556  | 5   |                              |           | 0       | 0             | 0         | 0            | 0.038    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.18     |
| 1,2-Dichlorobenzene         | 95-50-1  | 34536  | 10  |                              |           | 0       | 0             | 0         | 0            | 2700     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 17000    |
| 1,3-Dichlorobenzene         | 541-73-1 | 34566  | 10  |                              |           | 0       | 0             | 0         | 0            | 320      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 960      |
| 1,4-Dichlorobenzene         | 106-46-7 | 34571  | 10  |                              |           | 0       | 0             | 0         | 0            | 400      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 2600     |
| 3,3'-Dichlorobenzidine      | 91-94-1  | 34631  | 5   |                              |           | 0       | 0             | 0         | 0            | 0.21     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.28     |
| Diethyl Phthalate           | 84-66-2  | 34336  | 10  |                              |           | 0       | 0             | 0         | 0            | 17000    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 44000    |
| Dimethyl Phthalate          | 131-11-3 | 34341  | 10  |                              |           | 0       | 0             | 0         | 0            | 270000   | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 1100000  |
| Di-n-Butyl Phthalate        | 84-74-2  | 39110  | 10  |                              |           | 0       | 0             | 0         | 0            | 2000     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 4500     |
| 2,4-Dinitrotoluene          | 121-14-2 | 34611  | 10  |                              |           | 0       | 0             | 0         | 0            | 1.1      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 34       |
| 1,2-Diphenylhydrazine       | 122-66-7 | 34346  | 20  |                              |           | 0       | 0             | 0         | 0            | 0.36     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 2        |
| Fluoranthene                | 206-44-0 | 34376  | 10  |                              |           | 0       | 0             | 0         | 0            | 130      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 140      |
| Fluorene                    | 86-73-7  | 34381  | 10  |                              |           | 0       | 0             | 0         | 0            | 1100     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 5300     |
| Hexachlorobenzene           | 118-74-1 | 39700  | 5   |                              |           | 0       | 0             | 0         | 0            | 0.0028   | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.0029   |
| Hexachlorobutadiene         | 87-68-3  | 34391  | 10  |                              |           | 0       | 0             | 0         | 0            | 4.4      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 180      |
| Hexachlorocyclopentadiene   | 77-47-4  | 34386  | 10  |                              |           | 0       | 0             | 0         | 0            | 240      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 17000    |
| Hexachloroethane            | 67-72-1  | 34396  | 20  |                              |           | 0       | 0             | 0         | 0            | 14       | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 33       |
| Indeno(1,2,3-cd)Pyrene      | 193-39-5 | 34403  | 5   |                              |           | 0       | 0             | 0         | 0            | 0.038    | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 0.18     |
| Isophorone                  | 78-59-1  | 34408  | 10  |                              |           | 0       | 0             | 0         | 0            | 350      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 9600     |
| Nitrobenzene                | 98-95-3  | 34447  | 10  |                              |           | 0       | 0             | 0         | 0            | 17       | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 690      |
| n-Nitrosodimethylamine      | 62-75-9  | 34438  | 50  |                              |           | 0       | 0             | 0         | 0            | 0.0069   | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 30       |
| n-Nitrosodi-n-Propylamine   | 621-64-7 | 34428  | 20  |                              |           | 0       | 0             | 0         | 0            | 0.05     | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 5.1      |
| n-Nitrosodiphenylamine      | 86-30-6  | 34433  | 20  |                              |           | 0       | 0             | 0         | 0            | 33       | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 60       |
| Pyrene                      | 129-00-0 | 34469  | 10  |                              |           | 0       | 0             | 0         | 0            | 830      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 4000     |
| 1,2,4-Trichlorobenzene      | 120-82-1 | 34551  | 10  |                              |           | 0       | 0             | 0         | 0            | 260      | 1E+100     | 1E+100   | 1E+100   | 1E+100   | 940      |

| POLLUTANTS               | CAS No.    | STORET | MQL  | Instream Waste Concentration |                                |                             |                                     |                                 |                                 |         | Domestic<br>Criteria<br>ug/l | Irrigation<br>Criteria<br>ug/l | 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 |
|--------------------------|------------|--------|------|------------------------------|--------------------------------|-----------------------------|-------------------------------------|---------------------------------|---------------------------------|---------|------------------------------|--------------------------------|--|--------------------------------------|--|-------------------------------------|
|                          |            |        |      | Ambient<br>Conc<br>Ca (ug/l) | Effluent<br>Conc.<br>Ce (ug/l) | Acute<br>Aquatic<br>2.13*Ce | Domestic<br>Supply<br>Cd,dom (ug/l) | Chronic<br>Aquatic<br>Cd (ug/l) | Human<br>Health<br>Cd,hh (ug/l) |         |                              |                                |  |                                      |  |                                     |
|                          |            |        |      | <b>PESTICIDES AND PCBs</b>   |                                |                             |                                     |                                 |                                 |         |                              |                                |  |                                      |  |                                     |
| Aldrin                   | 309-00-2   | 39330  | 0.01 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.00049 | 1E+100                       | 1E+100                         | 3  | 1E+100                               | 0.0005                                 |                                     |
| Alpha-BHC                | 319-84-6   | 39337  | 0.05 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.026   | 1E+100                       | 1E+100                         | 1E+100                                     | 1E+100                               | 0.049                                  |                                     |
| Beta-BHC                 | 319-85-7   | 39338  | 0.05 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.091   | 1E+100                       | 1E+100                         | 1E+100                                     | 1E+100                               | 0.17                                   |                                     |
| Gamma-BHC                | 58-89-9    | 39340  | 0.05 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.19    | 1E+100                       | 1E+100                         | 0.95                                       | 1E+100                               | 0.63                                   |                                     |
| Chlordane                | 57-74-9    | 39350  | 0.2  |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.008   | 1E+100                       | 1E+100                         | 2.4  | 0.0043                               | 0.0081                                 |                                     |
| 4,4'-DDT and derivatives | 50-29-3    | 39300  | 0.02 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.0022  | 1E+100                       | 0.001                          | 1.1  | 0.001                                | 0.0022                                 |                                     |
| Dieldrin                 | 60-57-1    | 39380  | 0.02 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.00052 | 1E+100                       | 1E+100                         | 0.24                                       | 0.056                                | 0.00054                                |                                     |
| Alpha-Endosulfan         | 959-98-8   | 34361  | 0.01 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 62      | 1E+100                       | 1E+100                         | 0.22                                       | 0.056                                | 89                                     |                                     |
| Beta-Endosulfan          | 33213-65-9 | 34356  | 0.02 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 62      | 1E+100                       | 1E+100                         | 0.22                                       | 0.056                                | 89                                     |                                     |
| Endosulfan sulfate       | 1031-7-8   | 34351  | 0.1  |                              |                                | 0                           | 0                                   | 0                               | 0                               | 62      | 1E+100                       | 1E+100                         | 1E+100                                     | 1E+100                               | 89                                     |                                     |
| Endrin                   | 72-20-8    | 39390  | 0.02 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.76    | 1E+100                       | 1E+100                         | 0.086                                      | 0.036                                | 0.81                                   |                                     |
| Endrin Aldehyde          | 7421-93-4  | 34366  | 0.1  |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.29    | 1E+100                       | 1E+100                         | 1E+100                                     | 1E+100                               | 0.3                                    |                                     |
| Heptachlor               | 76-44-8    | 39410  | 0.01 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.00079 | 1E+100                       | 1E+100                         | 0.52                                       | 0.0038                               | 0.00079                                |                                     |
| Heptachlor Epoixde       | 1024-57-3  | 39420  | 0.01 |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.00039 | 1E+100                       | 1E+100                         | 0.52                                       | 0.0038                               | 0.00039                                |                                     |
| PCBs                     | 1336-36-3  | 39516  | 0.2  |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.00064 | 1E+100                       | 0.014                          | 1E+100                                     | 0.014                                | 0.00064                                |                                     |
| Toxaphene                | 8001-35-2  | 39400  | 0.3  |                              |                                | 0                           | 0                                   | 0                               | 0                               | 0.0028  | 1E+100                       | 1E+100                         | 0.73                                       | 0.0002                               | 0.0028                                 |                                     |

Note: SCORET CODE for reference only. Codes for total form are used except for parameters which have criteria in both total and dissolved forms.

**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 "Procedures for Implementing NPDES Permits in New Mexico" amended July 2009

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







