HOW THE CORPORATION COMMISSION'S NEW WATER QUALITY STANDARDS IMPLEMENTATION PLAN APPLIES TO SITE REMEDIATION AND RBCA

By Patricia Billingsley, Oklahoma Corporation Commission

ABSTRACT

Oklahoma Senate Bill 549, passed in 1999, required all of Oklahoma's environmental agencies to write and by July 1, 2001 implement a Water Quality Standards Implementation Plan (WQSIP) specifying how the State's water quality standards will be applied within each agency's areas of environmental jurisdiction. The Oklahoma Corporation Commission's (Corp Comm's) Oil and Gas Division has jurisdiction over many areas, from pipelines to oil and gas exploration and production to spill remediation, that are addressed by the Division's newly adopted WQSIP. Included in the WQSIP are 1) how the WQSIP applies in each Corp Comm jurisdictional area, 2) the water quality standards to be met when a spill affects or potentially affects surface or ground water, 3) where (regulatory point of compliance) these Water Quality Standards must be met, and 4) how the remediation/cleanup standards for soil and water (numerical table or RBCA derived) at the problem's source will be set.

BACKGROUND INFORMATION ON THE WQSIP

Senate Bill 549

The federal Clean Water Act requires that each state write state Water Quality Standards. In Oklahoma, this is done by the Oklahoma Water Resources Board (OWRB). However, the OWRB has no enforcement authority in areas that the other state agencies regulate. To settle this issue, Oklahoma Senate Bill 549, passed in 1999, explicitly required all seven Oklahoma state environmental agencies to enforce the state Water Quality Standards (WQS) written by the OWRB.

In Oklahoma, many different state agencies have authority over specific jurisdictional areas. For example, the Department of Agriculture enforces the state's Agricultural laws; the Bureau of Mines enforces laws related to mining; the Department of Environmental Quality enforces rules relating to NPDES permits, industrial activities (including refineries), water supply systems, etc.; and the Corporation Commission enforces laws relating to trucking, utilities, oil and gas production and transportation (but not refining), and petroleum storage tanks. Prior to 1999, when SB 549 was passed, there was no explicit state enforcement mechanism for the OWRB's Water Quality Standards. Now, each state agency whose authority includes environmental oversight has had to explicitly:

- State that it will enforce the WQS;
- Determine what the to standards be enforced are;
- Determine how and where the standards will be met, and
- By July 1, 2001, write and adopt into rule a Water Quality Standards Implementation Plan (WQSIP), approved by the state's WQSIP Advisory Committee, specifying exactly how within its specific areas of environmental jurisdiction this will be done

The Oklahoma Corporation Commission must thus enforce OWRB's WQS for Oil and Gas exploration and production and underground storage tank activities, including pollution cleanups. The required WQSIP for the Oil and Gas Conservation Division is described in this paper. Corp Comm's Petroleum Storage Tank Division will have its own WQSIP.

Water Quality Standards

Water Quality Standards (WQS) are the numerical and/or narrative standards set by the Oklahoma Water Resources Board (OWRB) as required by the Federal Clean Water Act. While the CWA only requires surface water standards, the OWRB has chosen to include ground water standards. The goal of OWRB's rules is to prevent "degradation" of, and protect the OWRB defined beneficial uses of, state surface and ground waters. The specific standards set for each natural stream, lake, or groundwater source depends on the beneficial uses and historical background data for that water body. Different water bodies have different standards, depending on their historical uses. OWRB's WQ standards must be followed unless "more appropriate" standards are found to prevent degradation and protect the beneficial uses.

Examples of WQS are the requirement that pH levels in fishable streams be between 5.5 and 9.0, or that there be no visible oil on the water or in stream sediments. Water bodies with natural pollutants (e.g. the Cimarron or the Salt Fork of the Arkansas, which have high natural salt levels), and streams with seasonal low flow preventing use, will have different standards than those historically usable for irrigation, water supply, swimming, etc.

Surface Waters

Protective Beneficial Uses set by OWRB for individual water bodies include:

- Public or private water supply (PPWS) or Emergency water supply (EWS).
  No harmful levels of chemicals, metals, oil, etc. can be present in primary drinking water supply waters; Numerical standards are set for many substances. Less restrictive standards are set for rarely used emergency supplies.

Public and private water supplies that are especially sensitive or vulnerable to potential pollution are to get special protection (SWS). For example, Commission rule 165:10-7-6 allows the Corp Comm to enact special Oil & Gas field rules in specific areas to protect water and water supplies if a city or other governmental entity requests it.

- Fish and Wildlife Propagation (F&W).
  Different standards are set to protect a:
  1. Cool Water Aquatic Community (e.g. trout streams and Lake Tenkiller in eastern Oklahoma), than a
  2. Warm Water Aquatic Community (the average Oklahoma Stream) or a
  3. Habitat Limited Aquatic Community (intermittent streams or those with natural pollutants inhibiting aquatic life).
  4. Some Wetlands Aquatic Community standards have also been proposed.

- Agricultural use (Ag).
  Maximum total dissolved solids (TDS) and salinity anions are defined for waters used for livestock watering and/or irrigation. In the state WQS there are four possible surface water numerical standards (codes M, 1, 2, and 3 in OAC Chapter 45) Appendix A Table 2, and three possible groundwater classes.

- Primary Body Contact Recreation (PBCR).
  Standards for bacteria and other pollutants are set to protect swimmers

- Secondary Body Contact (SCBR).
  Lesser standards are set for occasional water contact during boating and fishing.

- Aesthetics (Aes).
  Natural waters must be free of visible oil, excess sediment, noxious odors, etc.

- Scenic rivers, their tributaries, and some waters in designated parks and wildlife areas have been designated Outstanding Resource Waters (ORW) or High Quality Waters (HQW). These get special protection.

- Requirements for Navigation (Nav), Industrial and Municipal uses including cooling water (I&M), and Hydropower (HP) are NOT included in the WQSIP, since Corp Comm doesn't regulate these activities.

Listed beneficial uses for streams and lakes are in the water quality rules; however, many small and intermittent streams are not listed in Table 2 (cited above).

Ground Water - Class I, II, and III

The OWRB has split the state's groundwaters into three classes, with different levels of protection and water quality standards for each.

- Class I, special source groundwaters, includes waters that
  1. Have exceptional water quality and/or are ecologically important (example – support endangered species), or
  2. Are an irreplaceable source, or
  3. Are in a public water supply wellhead protection area, or
  4. Underlie and supply scenic rivers or designated parks, wildlife areas and wetlands listed in Appendix B of OAC Chapter 45.

- Class II groundwaters are those capable of being used as water supplies for humans, with total dissolved solids < 3,000 mg/l (ppm). The OWRB publishes maps showing the state's alluvium and bedrock groundwater aquifers.

- Class III Groundwaters have limited use since their TDS is $\geq$ 3,000 mg/l. While they can still provide drinking water for some animals or supply some streams, they are generally not protected since human don't use them.

The OWRB has also classified groundwater aquifers according to their vulnerability to contamination. The OWRB's Technical Report 99-1 has maps of the different areas and their vulnerabilities. The Commission may have to add special protection rules in areas the OWRB has designated as highly vulnerable.

Specific Water Quality Standards

Water Quality Standards for specific uses are set by OWRB for certain parameters, both pollutants and related stream conditions. Depending on the use, limits are set for one or more of these parameters. The second column (below) lists parameters rarely if ever apply to Oil and Gas activities regulated by the Commission; these are not included in the WQSIP.

- Total Dissolved Solids
- Salts (chlorides)
- Petroleum compounds
- Dissolved heavy metals
- pH
- Turbidity (man-caused excess erosional runoff sediments into surface water)
- Pesticides
- Herbicides
- Sulfate
- Dissolved Oxygen
- Bacteria

In addition, the Corporation Commission has Water Quality Decision Level Criteria for pollution cleanups, discussed below in the Commission WQSIP section.

USAP

The OWRB also wrote Use Support Assessment Protocols (USAP), specifying how many times a water body had to be sampled and how many of those samples had to exceed standards in order to determine whether or not the water body is impaired. One water sample is almost never enough to prove impairment. Examples of how USAP works are:

- A minimum of 10 samples collected over a year (all 4 seasons) is usually required to determine if the water body meets WQ standards. However, if staff collect 3 or more samples that exceed sample standards for one or more parameters, the other 7 samples are not needed – impairment is already obvious.

- For some parameters (such as TDS, sulfates and chlorides), there are both a numerical individual sample standard, set two standard deviations above the historical mean, and a mean standard, set one standard deviation above the mean.

- If a water body exceeds the sample standard for one or more parameters for >10% but ≤25% of the total samples collected, the water body is partially supporting and may need action.

- If a water body exceeds the sample standard for one or more parameters for > 25% of the samples, it is impaired and action, such as a cleanup or TMDL plan, is needed.

- If a water body averages higher than the mean standard, it is deemed impaired and action, such as a cleanup or TMDL plan, is needed.

- If a water body exceeds sample standards for one or more parameters in one or more samples by an order of magnitude, it may be deemed impaired.

To Get OWRB Water Quality Rules

Water quality standards information is in OWRB's Chapter 45 (uses/standards) and Chapter 46 (USAP) rules. These are available at http://www.state.ok.us/~owrb/rules/Rules.html, or from the

Secretary of State, Office of
Administrative Rules
2401 North Lincoln Boulevard, Rm. 220
405/521-4911

Secretary of State, Office of
Administrative Rules
P.O. Box 53390
Oklahoma City, Oklahoma, 73152-3390

THE COMMISSION'S WQSIP

Section I - Required Background Information.

This section is divided into subsections, by subject:

A. Pages 2-3 list the SB 549 required elements.

B. Pages 3-13 list the Commission's definitions of terms.

C. Page 13 has the General statement of intent for the WQSIP.

D. Pages 14-16 list the legal citations of state OWRB Chapter 45 Water Quality Standards for surface and ground water (this is a good cure for insomnia).

E. This subsection lists the Corporation Commission's functional jurisdictional areas:

1. There are two Corp Comm Divisions that handle pollution matters – Oil and Gas Conservation, and Petroleum Storage Tanks. This WQSIP is ONLY for the Oil and Gas Conservation Division (Oil & Gas).

2. Within Oil & Gas the Field Operations and Pollution Abatement/UIC departments handle environmental/pollution matters.

3. The Field Ops Field Inspectors, who work out of four district offices in the northeast, northwest, southeast, and southwest quadrants of the state:
   a. inspect sites to make sure all Oil and Gas rules are followed,
   b. are the first to respond to spills and pollution complaints at drill sites, pipeline breaks, etc,
   c. perform the initial soil sampling, and sometimes water sampling also, and
   d. oversee or approve most surface spill cleanups and soil remediation activities.

4. The Pollution Abatement section (PA) within the PA/UIC department has four hydrologists assigned one per Field Operations district office. There are also the PA/UIC Manager, an engineer who oversees land application and commercial mud pits, the PA supervisor, and one hydrologist in the Oklahoma City office. The hydrologists:
   a. do most of the water sampling, and assist Field Ops with complex pollution cases, especially cases involving surface and ground water;
   b. directly oversee assigned complex cases; and
   c. perform federal Clean Water Act (CWA) related activities, including sampling surface and ground waters of the state to determine which waters are impaired and need to be placed on the 303d list, and participating in state/federal interagency work groups, grant committees, and the Oklahoma Water Quality Monitoring Council.

5. The Underground Injection Control (UIC) section sets pollution prevention requirements on saltwater disposal (injection) and secondary recovery wells, and inspect for compliance.

6. There are other related departments with related duties –
   a. The Oil & Gas Technical Department (Tech) oversees technical matters and rules for pollution prevention, and issues drilling permits;
   b. The Pipeline Safety program (Transportation Division) oversees the design, installation, operation, maintenance and abandonment of natural gas and liquid petroleum pipelines. Field Ops and PA/UIC handle pipeline spill cleanup.
   c. The Pollution Response section within the Consumer Affairs division takes pollution complaints and passes them to the appropriate Oil and Gas staff for investigation. They also assist when needed with site and stream sampling.

F&G Pages 19-22 – This section has tables listing the specific jurisdictional areas of the Commission, and OWRB defined beneficial uses each could affect.

H. The OWRB Use Support Assessment Protocols are described in this sub section.

Section II - Requirements For Cleaning Up Pollution Caused By Spills And Other Problems

This section is divided into subsections, by subject.

A. The Oil & Gas Water Quality Decision Level Criteria were adopted to implement requisite water quality standards in pollution cleanups. **The point of compliance to meet standards is usually at the receptor location – the stream, well, or other location where an entity could be exposed to pollutants.** This is usually not <u>at</u> the spill or other source location; cleanup standards at the source are set on a site-specific basis to assure compliance at the receptor location.

1. Most of these criteria are based on the OWRB Water Quality Standards, or (for drinking water receptor locations such as wells) from EPA Drinking Water Standards as used by the Oklahoma Department of Environmental Quality.

2. When specific WQ standards have not been set for certain parameters, criteria were developed to prevent degradation of state waters and continue their beneficial uses. For example, the OWRB has not set standards for sodium. Since excess sodium in irrigation water can damage soils in croplands, the sodium standard for irrigation water sources is set at the Oklahoma State University's (OSU's) recommended levels for irrigation water.

3. The Commission may also enact special Oil & Gas field rules in specific areas to protect water and water supplies if a city or other governmental entity requests it.

Some specific standards are:

- For Class I groundwaters, by Class II drinking water wells, and by surface water supply intakes:

  1. EPA and DEQ drinking water standards must be met for all listed substances (petroleum, metals, salts, etc) and

  2. No visible free product allowed.

- For salinity in irrigation water:

  1. OWRB surface water agricultural (OAC Chapter 45 Appendix C and F) standards must be met, and

  2. OSU's guidelines (on analysis forms) for excessive sodium applied to soils via irrigation water will be used for both surface and ground water.

- For salinity in other surface waters:
  OWRB Appendix C and F standards must be met.

- For petroleum in Class II groundwater <u>not</u> by water wells:

1. Corp Comm O&G defined (see attached Table) or Risk Based (RBCA) numerical criteria in guidelines must be met, and

2. Measurable free product is removed.

3. The levels of GRO and/or DRO and/or other specific petroleum carbon ranges will be used as guidelines on a case-by-case basis.

- For petroleum in surface waters not by water supply intake areas:

  1. Visual presence of oil and (when there is analytical data)

  2. OWRB standards for benzene, ethyl benzene, and toluene or RBCA numerical criteria are used.

  3. GRO and/or DRO and/or other specific carbon range levels will be used as guidelines on a case-by-case basis.

- For heavy metals in Class II groundwater away from wells:
  Risk based standards are used.

- For heavy metals in surface waters not at a water supply:
  OWRB WQ standards set for PPWS, F&W, and other beneficial uses are used.

- For turbidity from excess sediments in erosional runoff into surface water:
  OWRB WQ standards for F&W and Aesthetics determine the need for corrective action.

B. The compliance elements for spill cleanups are:

- Corp Comm O&G does not become involved in specific cases unless:
  1. a complaint is made, or
  2. probable impairment is found, or
  3. a violation of rules is found by staff, or
  4. a request for approval of a voluntary pollution abatement plan is submitted to the agency.

- The goal of the Commission is to prevent spills from impairing state waters, and/or to restore water quality whenever feasible if waters become impaired in order to protect beneficial uses.

- Recent spills and new polluted sites are remediated by the responsible party.

- Historic pollution sites with no RP to do a cleanup are referred to the Oklahoma Energy Resources Board.

Specific guidelines and procedures to follow include the following:

- The Commission must be promptly notified when spills or leaks are found.

- Operators must promptly undertake cleanup activities. Field Inspectors will provide guidance (in their "Oklahoma Corporation Commission Guidelines for Responding to and Remediating Spills") and oversee most cleanups.

- Extensive problems (especially involving water pollution) may be assigned to Pollution Abatement staff.

- The Commission may request a thorough site assessment that includes soil and/or groundwater and/or surface water observations, measurements, and/or sampling and laboratory analyses.

- Commission staff will determine or approve the appropriate soil and water action and cleanup levels.

- The Pollution Abatement section provides guidance in their "Site/Risk Assessment and Cleanup Guidelines for Petroleum Hydrocarbon and Heavy Metal Pollution". RPs can use either a Risk Based Corrective Action methodology or the fixed numerical standards in PA's guidance, which includes the 'Soil and Groundwater Petroleum Products Remediation Index Table'.

- State Water Quality Standards or other more appropriate numerical criteria as specified in the Commission's Water Quality Decision Level Criteria will be met at the nearest potential water body or well and/or other receptor location on a site specific basis.

- The Commission may monitor or require the responsible party (RP) to monitor surface and/or ground waters to ensure that appropriate water quality will be met before pollutants can reach a possible receptor/recipient.

- When a remediation is completed, appropriate water quality monitoring will be done to ensure that water quality standards have been met; the new rules require 1 year of monitoring or as approved by staff.

- In a water quality problem relating to historic activities, when there is no RP or when a cleanup is not technically feasible, a finding of "irreversible man-induced impacts" under federal law (40 CFR 131.10(g)(3)) may be made.

In addition, Corp Comm guidance indicates that USAP will be followed for determining water body impairment except where no protocol has yet been written by OWRB, in which case the Commission's "Water Quality Decision Level Criteria" or other standards and actions proven to be more applicable will be used.

C. While most Corp Comm Oil and Gas environmental activities are related to pollution complaints and cases, some other work related to the Clean Water Act or state mandates is done. Some of these are listed below:

- Programs generally affecting water quality, and Clean Water Act issues:
  1. Commission staff will monitor (sample) and/or request that other state agencies such as the OWRB assist them to monitor ground and surface waters of the state in response to widespread non case-specific complaints and in historically polluted areas.
  2. Surface waters found to be impaired or only partially supporting will be placed or kept on the federal 303(d) list and/or into the 305(b) report as appropriate.

- Technical Information and Procedures:
  1. The Commission provides guidance documents.
  2. Ground and surface Water Quality monitoring data is kept in computer spreadsheets, which are used in the determination of water body impairment.

- Compliance With Mandated Water Quality Management Activities:
  Corp Comm PA staff participate in all state interagency environmental workgroups, grant meetings, water quality standards revisions, and the Oklahoma Water Quality Monitoring Council.

- Public Participation:
  The Commission has public meetings for rules adoption, has had four public Water Quality Standards Implementation explanatory meetings, and is planning additional meetings.