

**SOLID WASTE – “Don’t let ‘em take it away”**

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## Municipal Solid Waste

### I. Introduction.

The handling, storage, processing, and disposal of municipal solid waste (“MSW”)<sup>1</sup> is regulated in Texas by the Texas Commission on Environmental Quality (“TCEQ”). See TEX. HEALTH & SAFETY CODE CHAPTER 361 (WEST 2008). This article will discuss the most recent developments in MSW regulation in the areas of rule-making, contested case decisions, and judicial decisions.

### II. Rule-making.

#### A. 2006 Revisions.

The TCEQ’s substantive rules governing the design and operation of MSW facilities are contained in 30 TEX. ADMIN. CODE Chapter 330. In 2006, Chapter 330 underwent an extensive revision which established significant new design and operational requirements, effective March 27, 2006. See 31 Tex. Reg. 2502 (March 24, 2006). (“2006 Revisions”). Key changes made by the 2006 Revisions are summarized in the following Table 1:

**TABLE I**  
**CHAPTER 330 RULE SUMMARY**

1. Applicability.	<ul style="list-style-type: none"><li>● Effective 20 days after filing with Secretary of State with consistent implementation dates of 180 days to submit permit modifications except for groundwater monitoring (2 years), which allows for more efficient application preparation and review. § 330.1(a).</li><li>● Pending applications declared administratively complete prior to effective date have one year to submit modification requests except for two years for groundwater monitoring. §330.1(a)(2).</li><li>● Pending applications not involving capacity increases filed by effective date or within 180 days thereof are subject to former rules § 330.1(a)(5).</li></ul>
2. Definition of Contaminated Water.	Defined as leachate, gas condensate, or water that has contacted waste. §330.3(36).
3. Web Posting.	Owner/operator required to provide copies of applications on the internet with link provided to the TCEQ. Internet posting limited to applications requiring public notice and is for informational purposes only. § 330.57(i).

<sup>1</sup> The term “municipal solid waste” is defined as solid waste resulting from or incidental to municipal, community, commercial, institutional, or recreational activities and includes garbage, rubbish, ashes, street cleanings, dead animals, abandoned automobiles, and other solid waste other than industrial solid waste. TEX. HEALTH & SAFETY CODE § 361.603(20)(West 2008).

4. Mineral Interest Notice.	Notice to owners of mineral interests under the facility required based on appraisal district records as of the date application filed. § 330.59(c)(3).
5. FEMA Maps.	FEMA maps are prima facie evidence of floodplain location. § 330.63(c)(2)(B).
6. Recirculation of Leachate.	Leachate and gas condensate derived from a landfill unit may be recirculated into a unit at the same facility with a composite liner and leachate collection system or an alternative liner with leachate collection system. § 330.177.
7. Alternative Daily Cover (ADC)	Contaminated soils used for ADC may not exceed 1500 ppm total petroleum hydrocarbons (TPH) and greater concentration allowed if demonstration approved by agency. § 330.165(d).
8. Recycling Storage Requirements.	Waste and recycled materials shall be stored in an enclosed building, vessel, or container. § 330.209(c).
9. Quality Assurance/Quality Control (QA/QC).	Owners and operators must ensure that laboratories comply with minimum QA/QC standards for sampling and analysis. QA/QC standards adopted with sunset provision of January 1, 2009. § 330.261.
10. Surface Drainage.	<ul style="list-style-type: none"> <li>● Final cover design shall provide for long-term erosional stability during <b>all phases</b> of landfill operation, closure, and post-closure care.</li> <li>● Erosional stability analysis limited to external embankment slopes, clarifying and limiting scope of stability analysis. § 330.305(d).</li> </ul>
11. Expansion over Non-Subtitle D Cells.	Vertical expansion over pre-Subtitle D cells must include composite liner and leachate collection system or alternative liner. § 330.331.
12. Groundwater Monitoring.	<ul style="list-style-type: none"> <li>● Monitoring well spacing shall not exceed 600 feet without site specific demonstration. § 330.403(a)(2).</li> <li>● Field filtering of samples prohibited; unfiltered samples required with 2-yr phase-in period. § 330.405(c).</li> <li>● Closed sites which stopped receiving waste prior to October 1993 are exempted from groundwater monitoring except as specified by permit. § 330.401(a).</li> </ul>
13. Closure Cost Estimates.	Closure and post closure cost estimates based on the largest area requiring closure in the following year. § 330.503.
14. Buffer Zones.	Buffer zones for new landfills and expansions increased from 50 feet to 125-feet, which is measured from new waste placement, including vertical expansions. § 330.543(b).
15. Standard Air Permit	Effective September 1, 2006, new standard air permit created to authorize air emissions from MSW landfills and transfer stations meeting conditions listed in the rule. §§ 330.981-330.995.

16. Medical Waste	Compliance with revised medical waste rules required with 120 days of the effective date of the 2006 Revisions, including revised definition of “special waste” (§ 330.3(148) which excludes treated medical waste; expanded 75-mile definition of “on-site” for medical waste generators (§ 330.1205)); and revised disposal requirements applicable to treated sharps (§ 330.1219(b)(4)).
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To effectuate compliance with certain new requirements, the 2006 Revisions require existing permittees or registrants to file applications for permit modifications demonstrating compliance. Owners and operators were required to apply for a permit modification to comply with new requirements for analytical quality assurance and quality control and to remove any inconsistent provisions within 180 days of the effective date of the 2006 Revisions. 30 TEX. ADMIN. CODE § 330.261(a). Permittees or registrants were also required to apply for a permit modification to comply with new surface water drainage requirements within 180 days. *Id.* § 330.301. Landfill owners and operators were given two years to demonstrate compliance with the new groundwater monitoring requirements. *Id.* § 330.401(b). This influx of permit modification applications has generated numerous questions concerning the regulatory interpretation of these new requirements.

1. Surface Water Drainage.

Among the reforms enacted by the 2006 Revision is a new requirement for landfills to control erosion during all phases of development, including interim conditions. Specifically, 30 TEX. ADMIN. CODE § 330.305(d) provides that “landfill design must provide effective erosional stability to top dome surfaces and external embankment side slopes during *all phases* of landfill operation, closure, and post closure care (emphasis added).” Heretofore, although MSW facilities were required to control erosion throughout the facility’s operating life, an erosion stability analysis was only required for final slope conditions at the time of facility closure.

The TCEQ has issued a draft guidance document, “Guidance for Addressing Erosional Stability during All Phases of Landfill Operation (“Draft Guidance”),” interpreting this requirement to assess interim conditions. The Draft Guidance, which is attached at Tab A, provides that the calculated permissible soil loss for intermediate cover phase top dome surfaces and external embankment slopes may not exceed 50 tons/acre/year depending on location/precipitation and slope length. Draft Guidance, p. 2. The Draft Guidance broadly defines the term “external embankment side slopes,” which is undefined in the 2006 Revisions, to include slopes which will remain inactive for longer than 180 days. The number of landfill slopes subject to the erosion control analyses for interim conditions, therefore, is significantly increased. The Draft Guidance also creates an ambitious 180-day time frame after construction of intermediate cover to install controls to meet the 50 tons/acre/year standard. *Id.*, p. 3.

## 2. Groundwater.

The 2006 Revisions also enacted important changes to groundwater monitoring requirements applicable to landfill owners and operations. The most significant change is the requirement that monitoring well spacing not exceed 600 feet without an applicable site-specific technical demonstration that may be supplemented with a multi-dimensional fate and transport numerical model. 30 TEX. ADMIN. CODE § 330.403(a)(2). A copy of a draft TCEQ internal guidance document interpreting this requirement is attached at Tab B. Issues center on how compliance with this standard will be achieved and under what circumstances will the TCEQ allow a site-specific demonstration in lieu of compliance with the 600-foot spacing standard. In addition, it appears that strict compliance with the 600-foot standard may be required. Thus, landfill owners and operators may be required to revise their systems and install additional wells even if their existing systems only slightly deviate from the 600-foot spacing standard.

## 3. Laboratory QA/QC.

In implementing the 2006 Revisions, the TCEQ is placing increasing emphasis on the use of practical quantitation limits (“PQLs”) in the evaluation groundwater monitoring data. A copy of a draft TCEQ internal guidance document relating to the use and interpretation of PQLs is attached at Tab C. It provides that the PQL must be the lowest concentration at which the analytical laboratory can report quantitative data within the specified limits of precision and accuracy.

## B. MSW Amendments and Modifications.

In a rule-making completed earlier this year, the TCEQ amended its procedural rules governing the modification and amendment of MSW permits. 30 TEX. ADMIN. CODE §§ 305.62 and 305.70, respectively. These changes have the effect of increasing public participation in the permitting process.

Section 305.70 identifies two types of permit modifications, those requiring notice and those that do not require notice, more informally known as “notice mods” or “non-notice mods.” In the recent rule-making the TCEQ expanded the list of those modifications requiring public notice. The rule-making also makes changes to the notice requirements specified in 30 TEX. ADMIN. CODE § 330.59(c)(3) by increasing the notice distance from 500 feet to ¼ mile. Accordingly, applicants requesting permit modifications requiring notice are now required to provide notice to landowners within ¼ mile of the facility. This new notice requirement also applies to new MSW permits and amendments.

In addition, the TCEQ amended its rules governing the amendment of MSW permits to specify the types of changes constituting a major amendment and thus, triggering the opportunity for a contested case hearing. In so doing, the TCEQ also created a new category of changes, often referred to as limited scope major amendments, which reopens for contested case hearing opportunity only those portions of the permit affected by the amendment.

The new rules specify that the following changes constituting a major amendment and requiring the submittal of a full permit application:

- (1) an increase in the maximum permitted elevation of a landfill;
- (2) a lateral expansion of an MSW facility other than changes to expand a buffer zone;
- (3) any increase in the volumetric waste capacity at a landfill or the daily maximum limit of waste acceptance for a Type V processing facility; and
- (4) upgrading of a permitted landfill facility to meet the requirements of 40 CFR Part 258, including facilities which previously have submitted an application to upgrade.

30 TEX. ADMIN. CODE § 305.62(i)(1). Applicants seeking to make any of these changes will be required to prepare and submit a full permit application addressing all substantive requirements in Chapter 330 applicable to the facility, regardless of whether the change actually affects those application components. For example, MSW permit applicants for a vertical expansion would be required to submit geologic and hydrogeologic information satisfying the Chapter 330 requirements, even though a vertical expansion over already developed or permitted landfill space does not involve changed geology from that assessed in the previous permitting action. All application components, regardless of effect, could be reopened in a contested case hearing. This MSW policy, which is long-standing practice and now express in the new TCEQ rule, may be contrasted with its counterpart policy in the hazardous waste program, providing that “[w]hen a permit is modified, only the conditions subject to modification are reopened.” See 30 TEX. ADMIN. CODE § 305.69(d)(6).

The new rules further specify that for all other major amendment applications for MSW facilities, only the portions of the permit and attachments to which changes are being proposed are required to be submitted. *Id.* § 305.62(i)(2). The rule provides examples of changes for which a full application would not be required. These are:

- (1) addition of an authorization to accept a new waste stream (e.g. Class 1 industrial waste);
- (2) changes in waste acceptance procedures and operating hours outside the hours specified by rule, or authorization to accept waste or operate on a day not previously authorized; and
- (3) addition of an alternative liner design under 30 TEX. ADMIN. CODE § 330.135.

*Id.* Because the rule specifies these changes as examples only, this list is not exhaustive, leaving open the question of what other types of changes will be subject to the more expanded public participation requirements for limited scope major amendments.

In addition to the expanded ¼ - mile notice requirements discussed above, the new rules also institute new requirements for signage as a public notice component. The signage requirements are applicable to new permits or major amendments and require applicants to post signs at their facility advising the public of proposed facility changes. *Id.* §330.57(i)(3). The rule specifies the information required to be posting as well as the required sign dimension and spacing and requires the sign to be posted within 30 days after the executive director's receipt of the application until the close of the final comment period. *Id.*

The new signage requirements are similar to sign posting requirements which are already in place for air permits. *See* 30 TEX. ADMIN. CODE § 39.604. The TCEQ's stated rationale for including them as part of the MSW program is to "better ensure that all persons have an opportunity to comment or obtain information regarding MSW activities being proposed in the community." 33 *Tex. Reg.* 4177 (May 23, 2008). The TCEQ reasoned that "potentially affected parties may be outside the area for mailed notice or may not routinely read published notices in the newspaper and could be unaware of a proposed permit action." *Id.* In adopting the final rule, the TCEQ added language, which is similar to that used for internet posting requirements, that the signage requirements are for informational purposes only. 30 TEX. ADMIN. CODE § 330.57(i)(3). Thus, the requirements are not jurisdictional, and any temporary failure to adhere exactly to the signage requirements, such as a blown-down sign, does not affect the Commission's jurisdiction to take action on the permit application.

In the same rule-making, the TCEQ amended its rules concerning the respective duties of owners and operators for the submission of MSW permit applications if a facility is owned and operated by different entities. Section 305.43 formerly provided that it is the operator's duty to submit the permit application if the facility is owned by one person and operated by another. This rule was amended to provide that in this circumstance, the owner may authorize, in writing, the operator to submit applications for a permit, amendment, or modification. *Id.* § 305.43(c). For a new MSW facility, the operator may submit an application for a permit with the written consent of the owner(s) of the land upon which the facility is to be located. *Id.*

### C. Computer Recycling.

The Texas Legislature passed House Bill ("HB") 2714 in 2007 requiring the TCEQ to implement a manufacturer-based computer recycling program. The TCEQ has recently adopted rules implementing the program, which is based on a manufacturer responsibility model, and unlike some other state programs such as California's, does not impose a tax or fee on manufacturers, retailers or consumers. *See* 33 *Tex. Reg.* 4506 (June 6, 2008).

The rules establish a new Subchapter I, entitled Computer Equipment Recycling Program, in Chapter 328 and have several key components. First, the new program relates only to the collection, recycling, and re-use of computer equipment used primarily for personal or home business use. 30 TEX. ADMIN. CODE § 328.133(a). Effective September 1, 2008, every manufacturer of computer equipment sold for consumer or



home business use must have a recovery plan for the equipment's convenient collection, recycling, or re-use prior to offering computer equipment for sale in Texas. *Id.* § 328.137. Persons having a compliant collection program by September, 2008, have until July 1, 2008, to submit their recovery plans to the TCEQ. *Id.* § 328.137(e). Examples of convenient collection methods include a system for consumers to return used equipment by mail; a physical collection site open and staffed to receive used equipment; or a collection event held for the return of equipment. *Id.* § 328.137(c).

Retailers and consumers of computers also have responsibilities under the new program. Retailers may not sell new computer equipment unless it is labeled with the manufacturer's brand, and the manufacturer is listed on the TCEQ's list of manufacturers as having a recovery plan and a compliant collection program. *Id.* § 328.139. Consumers remain responsible for any information left on their computer equipment that is collected, recycled, or re-used under the program. *Id.* § 328.141. Manufacturers and retailers are expressly exempt from any liability for information left on the collected, recycled, or re-used computer. *Id.* § 328.147(a).

The new rules require all computer equipment be recycled or re-used in a manner that complies with federal, state, and local laws. *Id.* § 328.149. To assure safe recycling, the TCEQ has adopted as mandatory many of the standards for electronics recycling operating practices approved by the Institute of Scrap Recycling Industries ("ISRI"), Inc. The mandatory practices include requirements for maintaining commercial contracts or equivalent arrangements for transfers of computer equipment for recycling; maintaining records of manifests, bills of lading, waste disposal records, and records documenting the location, condition, and disposition of computer equipment for a minimum three-year period; maintaining written work practices for addressing specified chemicals or constituents such as lead, mercury, and PCBs; measures to minimize the potential for hazardous substance releases; and spill reporting.

Finally, the new rules authorize the TCEQ to conduct audits and inspections to determine program compliance. *Id.* § 328.143(a). Warning notices will be issued for a first violation. *Id.* § 328.143(d). Therefore, the law authorizes penalties for non-compliance, including fines ranging from \$1,000 to \$10,000 for the second violation, and \$25,000 for subsequent violations by a manufacturer. *Id.* § 328.153.

### III. Judicial Decisions.

In an opinion issued on July 2, 2008, the Amarillo Court of Appeals determined that a waste disposal company lacked standing to contest the TCEQ's issuance of permit modification to another waste disposal company. *Texas Disposal Systems Landfill, Inc. v. Texas Commission on Environmental Quality*, \_\_\_ S.W.3d \_\_\_, 2008 WL 2608648 (Tex. App.—Amarillo, July 2, 2008, No. 07-07-0183-CV).<sup>2</sup>

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<sup>2</sup> Unless otherwise provided for by statute, venue for judicial review of agency decisions is in Travis County. TEX. GOV'T CODE § 2001.176(b) (West 2008). Therefore, this case would normally have been heard by the Third Court of Appeals in Austin; however, the case was transferred to the Seventh Court of Appeals in Amarillo to equalize dockets among the appellate courts, as authorized by order of the Texas Supreme Court, Misc. Docket No. 06-9136.

After acquiring a landfill from the City of Weatherford, IESI Texas Landfill, L.P. (“IESI”) sought a permit modification from the TCEQ. When the TCEQ’s Executive Director granted the permit modification, Texas Disposal Systems Landfill, Inc. (“TDSL”) filed a motion to overturn that action. The TCEQ Commissioners issued an order upholding the Executive Director’s decision to grant the permit modification from which TDSL appealed.

The threshold issue on appeal was whether TDSL had standing to complain about the Executive Director’s decision pertaining to the operation of an IESI’s landfill. Both TCEQ and IESI filed pleas to the jurisdiction in the district court. TDSL argued, however, that it should be allowed to contest the Executive Director’s decision because in its opinion the improper manner in which the agency acted on IESI’s modification request potentially jeopardized TDSL’s own relationship with its neighbors and hence its own landfill’s operation.

The court of appeals rejected this argument and upheld the district court’s order dismissing TDSL’s appeal. According to the appellate court, TDSL’s standing argument was based on mere speculation that it would be injured as a result of the TCEQ’s action on IESI’s application.

**TAB A**

# GUIDANCE FOR ADDRESSING EROSIONAL STABILITY DURING ALL PHASES OF LANDFILL OPERATION

(30 TAC §330.63(c)(1), §330.305(c), (d) and (e))

02/14/07

## I. Understanding of Intent of Rule with Respect to Phased Operation

The intent of the rule is found in the preamble which states “The commission requires, in 30 TAC §330.305(d), that the owner or operator provide long-term erosional stability for the landfill unit during all phases of unit operation, closure, and post-closure care from the previous requirement in 30 TAC §330.55(b)(8), which only requires long-term erosional stability for the final cover design.” In accordance with 30 TAC §330.63(c) Facility Surface Water Drainage Report, the landfill owner or operator is required to submit a report demonstrating their plan to minimize erosion during all phases of landfill operations with the intent of controlling soil loss and sediment transport from top dome surfaces and external embankment side slopes.

Landfill cover phases are defined as daily cover, intermediate cover, and final cover. Top dome surfaces and external embankment side slopes, for the purposes of compliance with 30 TAC §330.305(d) are:

- a) those above grade slopes that directly drain to the site perimeter stormwater management system (i.e., areas where the stormwater directly flows to a perimeter channel or detention pond designed in accordance with 30 TAC §§330.63(c), 330.303, and 330.305);
- b) have received intermediate or final cover; and,
- c) have either reached their permitted elevation, or will subsequently remain inactive for longer than 180 days.

Slopes which drain to ongoing waste placement, preexcavated areas, areas that have received only daily cover or areas under construction which have not received waste are not considered external side slopes.

Modern landfill development can take decades and interim top dome surfaces and external embankment side slopes can exist for many years before placement of the final cover system with permanent drainage features. Some past landfill practices have included large, sparsely-vegetated areas without sufficient drainage control features (e.g., berms, benches, terraces, swales, downchutes/letdown structures, etc.), leading to erosion and off-site discharge of sediments.

Management practices utilized for erosion and sediment control may be broadly categorized as nonstructural and structural controls. Nonstructural controls addressing erosion typically include: plans and designs to minimize disruption of the natural features, drainage, topography, vegetative cover features; phased development to minimize the area of bare soil exposed at any given time; plans to disturb only the smallest area necessary to perform current activities; scheduling of construction activities during the time of year with the least erosion potential; and specific plans for the stabilization of exposed surfaces in a timely manner. Structural controls are preventive and also mitigative since they control erosion and sediment movement. Structural controls include vegetative and nonvegetative stabilization of exposed surfaces, perimeter controls, sediment traps, improved sediment basins, silt fences, filter fabrics, stream crossings, etc.

The use of best management practices incorporating structural and nonstructural controls as appropriate should be adequate for the daily cover phase of landfill construction and for soil stockpiles. Final cover should be managed as provided for in the closure and post closure care plan required by 30 TAC 330 Subchapter K, Closure and Post-Closure.

Erosion control for above grade top dome surfaces and external embankment side slopes that drain directly to the site perimeter stormwater management system, have received intermediate cover and either reached their permitted configuration or will remain inactive for longer than 180 days should be managed using a system of nonstructural and structural erosion and sediment controls to meet rule requirements for the intermediate cover phase of landfill construction. The purpose of this guidance document is to discuss designs and calculations and to address specific controls before and after establishment of vegetation on intermediate cover top dome surfaces and external embankment side slopes.

## **II. Designs and Typical Calculations for Top Dome Surfaces and External Embankment Side Slopes to Demonstrate the Adequacy of the Measures, Practices and/or Devices Proposed:**

- a. Sample calculations and designs for sizing the necessary drainage collection, conveyance, and/or detention structures in accordance with 30 TAC §330.63(c).
- b. Describe soil stabilization practices, perimeter controls, top and side slope runoff controls, collection, conveyance, and containment structures at the areas where they will be installed at the site for the intermediate cover phase top dome surfaces and external embankment side slopes. Include a description of, and specifications for, temporary sediment retention structures for all phases of development.
- c. Provide a description of the hydrologic method and calculations used to estimate peak flow rates, peak velocities and run-off volumes as required. Provide information to demonstrate that estimated velocities are below permissible non-erodible velocities under similar conditions. (*"similar conditions" is interpreted to mean similar soil, vegetation, other cover type, topography, slope, etc., as the subject surface*).
- d. Soil erosion loss may be calculated using the Soil Conservation Service of the United States Department of Agriculture's Universal Soil Loss Equation or equivalent or better methods approved by the executive director. The applicant should provide information to demonstrate that the estimated potential soil loss from the intermediate cover phase top dome surfaces and external embankment slopes does not exceed the permissible soil loss for comparable soil-slope lengths and soil-cover conditions. *Calculated permissible soil loss may not exceed 50 tons/acre/year depending on location/precipitation and slope length.*

The applicant shall demonstrate that the various proposed procedures and typical controls to be implemented on these slopes will ensure that soil loss does not exceed the maximum soil loss specified above. This demonstration should consist of descriptions of where structural controls should be installed (e.g. maximum slope steepness, slope lengths and berms spacing, maximum spacing of drop chutes, maximum spacing of silt fencing, etc.) and parameters for non-structural control (e.g. types of vegetation to be utilized for erosion control, planting schedules, vegetation maintenance, etc.). Specific configurations or development scenarios showing specific locations of structural controls are not required. The applicant should demonstrate that the controls proposed will achieve soil loss that does not exceed the

maximum erosion soil loss specified above for the parameters proposed for installation. The controls proposed to keep soil loss below this maximum soil loss shall be proposed to be installed within 180 days from when the intermediate cover is constructed. Applicants with sediment capture facilities may incorporate the use of sediment capture and intermediate cover replenishment procedures to demonstrate that the net annual soil loss for that facility is less than the above amount.

- e. Provide sample hydraulic calculations and designs for sizing the necessary drainage collection, conveyance, and/or detention structures in accordance with 30 TAC §330.63(c).

### III. Typical Erosion and Sediment Control Management Practices and Specifications:

- a. **Side Slope Controls:** The use of benches, terraces, berms or swales is recommended to decrease down slope velocities of runoff that could cause erosion. Benches, terraces and berms should direct the flow to a protected drainage system (downchute) and outlet. The frequency of spacing should be based on a soil loss as described in the landfill final condition plan or to no more than 50 tons/acre/year. The estimated peak velocity should be less than the permissible non-erodible velocity under similar conditions. Rolled erosion control mats or blankets made from natural or synthetic fiber, or compost/mulch/straw blankets, as example, may also be used as cover on side slopes and on open earthen conveyance structures.
- b. **Seeding and Sodding:** Establishment of vegetation on the top dome surfaces and the external embankment side slopes remains the preferred surface protection practice for control of erosion. Perennial vegetative cover from seeding has been shown to remove between 50 and 100 percent of total suspended solids from stormwater runoff, with an average removal of 90 percent (USEPA, 1993). A goal of at least 60% vegetative cover is recommended.
- c. **Lining for Conveyance Structures:** If runoff may cause erosion in a conveyance structure, the structure should be lined using grass or sod, turf reinforcement mats, blankets, riprap, concrete, gabions or other appropriate material. Details of temporary and permanent surface stabilization measures for all conveyance structures within development areas at the site must be provided.
- d. **Check Dams:** Check dams are constructed using gravel, rock, gabions, compost socks, or sand bags to reduce flow velocity and therefore erosion in a swale or channel. Check dam design criteria should address, at a minimum, control of runoff velocity, hydraulic capacity to store and release runoff in a non-erodible manner, stability of dam construction materials; check dam foundation preparation.
- e. **Silt Fences:** Silt fences or fabric filter fences may be used where there is sheet flow. The maximum drainage area to the fence should not exceed the manufacturer's specification but in no case be greater than 0.5 acre per 100 feet of fence. To ensure sheet flow, a gravel collar or level spreader can be used upslope of the silt fence. The silt fence should be installed to reflect the interim erosion and sediment control needs rather than mirror the property lines or limits of disturbance.
- f. **Compost Filter Berms:** Compost filter berms, or mesh socks filled with compost material, measuring at least 1 foot high x 2 feet wide, may be installed at the bottom of slopes. The design and placement of compost filter berms must address the prevention of pooled water

over the cover system.

- g. Inlet Protection:** Inlet protection consisting of silt fence barriers, straw bale inlet barriers, block, and gravel drop inlet filters, etc., should be used where appropriate. Inlet protection is suited for small drainage areas (less than 1 acre).
- h. Stabilization Schedule:** Estimates regarding time to stabilize (treat, cover, or vegetate to reduce erosion potential) exposed clearings, stockpiles and fills, and time to establish vegetation should be described.
- i. Wind Erosion Control Measures:** Techniques to minimize wind erosion (blowing of dust or sediments) should be described if appropriate.
- j. Soil Types:** Descriptions of the soil types prevalent in the area (use the USDA/SCS County Soils Map), soil-types to be used for construction and the proposed erosion and sediment control techniques relating to the soil types should be described.
- k. Climate and Weather:** The climate and weather patterns prevalent at the site should be considered in the scheduling of development to take advantage of the pattern in reducing soil erosion and sedimentation.
- l. Water Bodies and Waterways:** Identification of water bodies and waterways on site and adjacent to the site, and a description of plans for their protection from sediment-laden runoff from the site should be described.

**IV. Describe Inspection, Maintenance, and Recordkeeping Frequencies and Techniques:**

- a.** Describe an inspection and recordkeeping schedule to determine the overall effectiveness for temporary erosion control structures.
- b.** Installation, regular inspection, and maintenance and record keeping of plan practices should be made part of the training curricula for landfill personnel.
- c.** Discuss plans for the removal of the temporary erosion control devices as they are replaced with permanent erosion and sediment control devices at the site.

**V. Explanations of terms:**

- a.** "Permissible non-erodible" velocity as referenced in 30 TAC §330.305(d)(1).
  - i.** Permissible velocity for sheet flow, this should be related to the type of soil (erodible vs. non-erodible) and the type of vegetation or synthetic cover over which the flow occurs. The USDA has published data on permissible non-erodible velocities based on the soil and vegetation cover-type. Manufacturers of synthetic erosion control covers usually include allowable non-erodible velocities over such surfaces.
- b.** Permissible soil loss for intermediate and final phases.

- i. Permissible soil loss for interim conditions is greater than that considered acceptable for final cover. Although the interim condition can last for decades, unlike final cover conditions, the landfill is still operational. Thus during the operational phase of landfill construction, personnel and equipment are available to remediate erosion conditions and place additional soil. Basing permissible losses in part on the facility's ability to replenish what is lost is an acceptable practice. Additionally, for unavoidable soil loss during the intermediate phase, there should be structures within the site that prevent the losses from leaving the site, e.g. silt screens installed on benches, channels, perimeter ditches, etc., to trap eroded materials prior to reaching the sedimentation basin, or a sedimentation basin (with analysis showing that the sediments will be recovered prior to the flow moving offsite).
- ii. The recommended permissible soil loss for the final cover phase remains at 2 to 3 tons/acre/year.

DRAFT



**TAB B**

**INTERNAL GUIDANCE FOR IMPLEMENTING  
THE 2006 RULE REVISIONS OF SUBCHAPTER J  
May, 2008**

**I. Introduction**

This document is to serve as an internal guide for the review of municipal solid waste permit modification (MOD) requests to address the 2006 rule revisions in Title 30 Texas Administrative Code (30 TAC) Chapter 330, Subchapter J.

**II. Regulatory Background and Applicability**

30 TAC Section (§)330.401(b) requires all MSW landfills to comply with the provisions of Subchapter J by applying for a permit MOD with public notice to revise any inconsistent permit provisions within two years of the effective date of the 2006 rule revisions (March 27, 2006). 30 TAC §330.401(a) states that landfills which have closed pursuant to 30 TAC §330.453, 330.455, or 330.457 may continue to monitor groundwater using the well location requirements contained in previously issued authorizations.

**Applicability:**

The revised Subchapter J regulations apply to all landfills with the exception of the monitoring well spacing requirements which apply only to those facilities that have not closed pursuant to the above rules prior to March 27, 2006.

Type IAE and Type IVAE facilities are not required to perform groundwater monitoring.

Type IV facilities must perform groundwater monitoring as specified in 30 TAC §330.417, and §330.417(b)(2) states that a groundwater monitoring system must be installed in accordance with 30 TAC §330.403, except for the point of compliance well spacing requirements of 30 TAC §330.403(a)(2). Therefore, Type IV landfills that have not established a point of compliance would be required to submit a permit MOD to conform with the 2006 rule revisions.

**Point of Compliance (POC):**

Defined in 30 TAC §330.3 as "A vertical surface located no more than 500 feet from the hydraulically downgradient limit of the waste management unit boundary, extending down through the uppermost aquifer underlying the regulated units, and located on land owned by the owner of the facility." The uppermost aquifer is defined in 30 TAC §330.3 as "The geologic formation nearest the natural ground surface that is an aquifer; includes lower aquifers that are hydraulically interconnected with this aquifer within the facility's property boundary." Aquifer is defined in 30 TAC §330.3 as "A geological formation, group of formations, or portion of a formation capable of yielding significant quantities of groundwater to wells or springs."

POC and well spacing requirements are discussed in 30 TAC §330.403, the key provisions being "A groundwater monitoring system must be installed that consists of a sufficient number of monitoring wells, installed at appropriate locations and depths, to yield representative groundwater samples from the uppermost aquifer as defined in §330.3 of this title (relating to Definitions)," and "The point of compliance monitoring system must include monitoring wells installed to allow determination of the quality of groundwater passing the point of compliance as defined in §330.3 of this title and to ensure the detection of groundwater contamination in the uppermost aquifer. Monitoring well spacing for a

municipal solid waste landfill unit shall not exceed 600 feet without an applicable site-specific technical demonstration that may be supplemented with a multi-dimensional fate and transport numerical flow model as set forth in subsection (e) of this section.”

### III. General Submittal Requirements and Review Procedures

The revisions to 30 TAC Chapter 330, Subchapter J are self-implementing in that each landfill facility permittee is directed to determine if the facility’s groundwater monitoring system and related information conforms to the 2006 revised rules, and to submit to the TCEQ a permit MOD application to revise any inconsistencies. A landfill with an existing approved application that contains a defined POC and a monitoring well (MW) spacing of  $\leq 600$  feet is not required to submit a permit MOD to demonstrate compliance with §330.403(a)(2). It should be noted, however, that the new Subchapter J rules grant a one time allowance to a landfill facility to revise its groundwater monitoring program with a permit MOD. Generally, such revisions to the groundwater monitoring would require a major amendment.

The following Table 1 presents the scenarios that the reviewer is likely to encounter with regard to POC and MW spacing submittals.

**Table 1. General scenarios and submittal requirements for POC and monitoring well (MW) spacing.**

Point of Compliance	Existing Well Spacing (feet)	Proposed Action	Submittal Required
A. Defined <sup>1</sup>	$\leq 600$	No change.	Existing POC & MW spacing confirmation. <sup>2</sup>
B. Defined	>600	Reduce to $\leq 600'$ MW spacing	Existing POC & new MW locations
C. Defined	>600	Remain at >600' MW spacing	Existing POC & provide MW spacing demonstration
D. Defined	N.A. <sup>3</sup>	Reconfigure POC <sup>4</sup> & $\leq 600'$ MW spacing	Justify POC & show new/existing MW locations
E. Defined	N.A. <sup>3</sup>	Reconfigure POC <sup>4</sup> & >600' MW spacing	Justify POC & provide new/existing MW spacing demonstration
F. Not defined	$\leq 600'$	Define POC	Justify POC
G. Not defined	>600	Define POC & $\leq 600'$ MW spacing	Justify POC & show new/existing MW locations
H. Not defined	>600	Define POC & >600' MW spacing	Justify POC & provide MW spacing demonstration

<sup>1</sup> The term “defined” means that a POC has been either previously depicted on a site map or accurately described in text submitted to the agency and authorized via a permit or amendment.

<sup>2</sup> The rules do not require a confirmation submittal; however, the agency encourages permittees to submit a letter and map noting the POC and MW well spacing.

<sup>3</sup> Since the POC is being reconfigured, the existing MW spacing will be evaluated during review of the permittee’s proposed action.

<sup>4</sup> The permittee may be proposing to lengthen, shorten, or move the POC closer to or further from the waste boundary.

### Scenario A

Scenario A presumes that a landfill has an approved POC and MW spacing  $\leq 600$  feet. As noted above, if a permittee's landfill is compliant with the POC and well spacing requirements, then the permittee is not required to submit any information in this regard to the agency. However, permittees in this situation are encouraged to submit a letter discussing the landfill's compliance with regard to §330.401(b) and a map of existing MW locations. The map that is submitted should be a copy of map previously authorized via a permit or amendment. The reviewer should verify that the map has been previously authorized. If so, then a letter notifying the permittee of receipt of the submittal should be generated. If there are questions as to whether the map has been previously authorized, or if there are discrepancies in the submittal and what appears to have been previously authorized, then a letter requesting clarification should be generated.

### Scenario B

Scenario B presumes that a landfill has an approved POC and existing MW spacing  $>600$  feet, and is proposing additional wells so that all POC wells are  $\leq 600$  feet. The permittee should submit a site map noting the currently authorized POC and all existing and proposed MWs. Information should also be provided regarding proposed MW design to include screened interval(s) and completion details tied to appropriate surface and subsurface elevations. The reviewer should verify that the site map and POC are consistent with the facility's current authorization and that the proposed MW spacing along the POC is  $\leq 600$  feet. The proposed new MW design information should be reviewed for consistency with the existing well system. Reference information for this evaluation should include the landfill's Groundwater Characterization Report. If this report can not be found in agency records, then the reviewer should request a copy from the permittee. If inconsistencies are noted or insufficient information provided regarding the POC, MW spacing, or MW design, then clarification should be requested from the permittee.

### Scenario C

Scenario C presumes that a landfill has an approved POC and existing MW spacing of  $>600$  feet, and is proposing a MW spacing where some or all of the POC wells are  $>600$  feet. The permittee should submit the information noted in Scenario B and also a demonstration that the proposed well spacing is adequate to allow determination of the quality of groundwater passing the point of compliance. This technical demonstration should address potential plume widths and may include multi-dimensional groundwater flow modeling. The technical demonstration should show that MWs are spaced so that plumes cannot pass the wells undetected. The reviewer should evaluate the proposed MOD as per Scenario B and also review the MW spacing demonstration. If inconsistencies are noted or insufficient information provided regarding the POC, MW spacing, or MW design, then clarification should be requested from the permittee.

### Scenario D

Scenario D presumes that a landfill has an approved POC and is proposing to either lengthen or shorten the POC, or move the POC closer to or farther from the waste disposal boundary, and is also proposing a MW spacing of  $\leq 600$  feet. The permittee should submit justification for the POC reconfiguration to include, at a minimum, the landfill's Groundwater Characterization Report, any geological or hydrogeological studies performed since the Groundwater Characterization Report, and historical groundwater potentiometric surface maps to depict any variations in groundwater flowpaths over time. The permittee should also provide information as to the existence of any on-going or potential future operations that could alter the groundwater conditions (e.g. dewatering, slurry walls, remediation

activities, etc.). If new MWs are being proposed, then information should be provided regarding proposed MW design to include screened interval(s) and completion details tied to appropriate surface and subsurface elevations. The reviewer should determine if the proposed POC is supported by the submitted information, that the POC well spacing is  $\leq 600$  feet, and that the proposed MW design (if applicable) is appropriate. If inconsistencies are noted or questions raised, then clarification should be requested from the permittee.

#### Scenario E

Scenario E presumes that a landfill has an approved POC and is proposing to either lengthen or shorten the POC, or move the POC closer to or farther from the waste disposal boundary, and is also proposing a MW spacing where some or all of the POC wells are  $>600$  feet apart. The permittee should submit the information noted in Scenario D and also a MW spacing demonstration as discussed in Scenario C. The reviewer should determine if the proposed POC is supported by the submitted information and if the MW spacing demonstration is adequate. If inconsistencies are noted or questions raised, then clarification should be requested from the permittee.

#### Scenario F

Scenario F presumes that a landfill does not have an approved POC, but it has a downgradient MW spacing of  $\leq 600$  feet. The facility's proposed action is to designate a POC with  $\leq 600$  feet well spacing. The permittee should submit the information in Scenario D. The reviewer should determine if the proposed POC is supported by the submitted information and that the POC well spacing is  $\leq 600$  feet. If inconsistencies are noted or questions raised, then clarification should be requested from the permittee.

#### Scenario G

Scenario G presumes that a landfill does not have an approved POC and the existing MW spacing is  $>600$  feet. This facility's proposed action is to designate the POC and reduce the POC well spacing to  $\leq 600$  feet. The permittee should submit the information noted in Scenario D. The reviewer should determine if the proposed POC is supported by the submitted information, that the POC well spacing is  $\leq 600$  feet, and that the proposed MW design is appropriate. If inconsistencies are noted or questions raised, then clarification should be requested from the permittee.

#### Scenario H

Scenario H presumes that a landfill does not have an approved POC depicted on a site map, and it has a downgradient MW spacing of  $>600$  feet. The facility's proposed action is to designate the POC and have some or all POC monitoring wells spaced  $>600$  feet apart. The permittee should submit the information discussed in Scenario D and a POC well spacing demonstration as discussed in Scenario C. The reviewer should determine if the proposed POC is supported by the submitted information and if the MW spacing demonstration is adequate. If inconsistencies are noted or questions raised, then clarification should be requested from the permittee.

### **IV. Things to Consider in Reviewing POC and MW Spacing MOD Applications**

1. The point of compliance should be clearly identified on a scaled site drawing of sufficient size and detail to depict the waste footprint, buffer zone, perimeter road, perimeter stormwater drainage features, well locations (existing and proposed), and facility boundary. The distances between point of compliance wells should be clearly noted on the drawing. However, if the applicant delineates spacing between groundwater monitoring wells in the text, and the reviewer can

determine through the use of an engineer's scale that the well spacing is less than or equal to 600 feet, then the actual dimensions are not required. If the spacing appears to be greater than 600 feet, then the reviewer should request that the actual spacing be noted between wells.

2. MW spacing should be measured along the point of compliance and wells should not be greater than 600 feet apart. In measuring well spacing around corners, the line measuring the distance between gw wells cannot cross waste. The line should be drawn equidistant from the waste based on existing MW spacing from waste. If any wells in the point of compliance monitoring system are greater than 600 feet apart, then the applicant must provide a demonstration. This demonstration should show that the proposed well spacing is adequate to allow determination of the quality of groundwater passing the point of compliance. This demonstration should address potential plume widths, and show that MWs are spaced so that plumes cannot pass the wells undetected.
3. The endpoints of the point of compliance should be the widest range of apparent groundwater flow direction, as depicted on historical groundwater potentiometric surface maps. Areas of the landfill where the groundwater flow direction appears outward (even if only slightly) away from the waste boundary should be considered downgradient for the purposes of establishing the point of compliance.
4. Any downgradient wells which are proposed to be removed and replaced with new wells as part of this permit revision must continue in the detection monitoring program until the replacement wells have been installed. There should be no gaps or lapses in the groundwater monitoring program as a result of any well repositioning or realignment. If the permittee does not indicate a time frame for installing new monitoring wells, then the reviewer should request this information. Generally, 90 days should be adequate for installing monitoring wells.
5. If a facility has a documented plume of contamination, then the permittee should provide a topographic map which delineates the extent of the plume to aid in the review of proposed well locations provided in response to §330.403(a)(2).
6. Type IV landfills should have an approved POC. If a landfill does not have an approved POC, the permittee should submit the information noted in Scenario D above. Type IV landfills are not required to have a POC well spacing of  $\leq 600$  feet.
7. Under the provisions of §330.401(d), an owner/operator of a permitted landfill facility may request a suspension of groundwater monitoring activities if it can be demonstrated that there is no potential for migration of hazardous constituents from the solid waste management unit to the uppermost aquifer. This request for suspension of groundwater monitoring must be submitted as a permit amendment.
8. The permit modification required by §330.401(b) is a notice modification submitted under §305.70(l) and must include the Part I form, payment of the \$150.00 application fee, a modification application consistent with §305.70(e), and an adjacent landowners list and map. The submitted revisions should be provided in redline/strikeout format to facilitate agency review.
9. There may be other parts of the permit that need to be revised to maintain consistency throughout the permit as a result of the MOD application. Permittees that revise the location of groundwater monitoring wells may also need to make conforming changes to the Site Development Plan Attachments or eliminate well locations from maps that are not intended to depict the monitoring system. The permittee should be made aware of this via the NOD letter to include a

recommendation that these conforming changes can be made upon approval of the well spacing permit modification.

## V. Other 2006 Subchapter J Rule Revisions

The following is a list of the 2006 Subchapter J rule revisions in addition to those discussed above for which the permittee should revise the facility's permit as necessary for consistency. These Subchapter J revisions apply to all Type I and Type IV landfills including closed facilities. Generally, these revisions would be to the facility's GWSAP, and the permittee should submit the revised pages in redline/strikeout format to clearly depict the proposed revisions. The agency would prefer that these GWSAP revisions be submitted in a separate MOD application from the POC and MW spacing MOD application. Since the changes to the GWSAP are administrative in nature, the separate GWSAP modifications may be processed as §305.70(l) modifications without notification. Permittees will not be requested to resubmit these revisions in a separate MOD application if they are included in the MW spacing MOD application.

1. **Field Filtering.** In accordance with §330.405(c), groundwater samples shall not be field-filtered prior to laboratory analysis. The permittee should remove provisions that allow field filtering of groundwater samples. No change is required for facilities that are sampling for total/non-filtered metals as part of their currently authorized sampling plans.
2. **Reporting, Resampling, and Demonstrations.** In accordance with §330.407(b), the permittee must determine if there has been a statistically significant increase (SSI) over background of any tested constituent within 60 days of each sampling event, and if there has been a SSI, the permittee must notify the agency within 14 days of this determination. In accordance with §330.407(c), an annual detection monitoring report is required to be submitted that includes a statement regarding any SSIs during the previous calendar year, a contour map of piezometric water levels in the uppermost aquifer, groundwater flow rate and direction in the uppermost aquifer, and the results of all groundwater monitoring, testing, and analytical work, including a summary of background groundwater quality values, groundwater monitoring analyses, statistical calculations, graphs, and drawings. The annual report must be submitted within 90 days after the facility's last monitoring event in a calendar year. The permittee should revise the reporting requirements in the GWSAP to be consistent with these new rules.
3. **Groundwater Monitoring Constituents.** In accordance with §330.407(a), the monitoring frequency for all constituents listed in §330.419 shall be at least semiannual during the active life of the facility and the closure and post-closure care period unless an alternate frequency is approved by the Executive Director, in which case the monitoring frequency must be no less than annually. §330.419 adopts by reference the Appendix I hazardous constituents listed in 40 Code of Federal Regulations, Part 258. The Appendix I constituent list does not include the water quality parameters formerly required by the MSW Permits Section. The permittee may remove water quality parameters from the list of monitoring constituents and include Appendix I constituents. It should be noted that even though the analysis of water quality parameters (ex: pH, alkalinity, chlorides, sulfates) is not required by 30 TAC §330, trend analysis of the water quality parameters may be useful supporting documentation for future ASD demonstrations.
4. **GWSAP Updates.** The permittee should revise the reporting requirements in the GWSAP to be consistent with the newly revised 30 TAC §330 rule requirements and specified limits for precision and accuracy at the practical quantitation limit. "Reporting limits" should be the practical quantitation limits (PQLs). If the GWSAP does not contain the following

information, then the reviewer should recommend this language be placed into the GWSAP:

“The practical quantitation limit (PQL) is defined as the lowest concentration reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions and is analogous to the limit of quantitation (LOQ) definition in the most recent available NELAC Standard (National Environmental Laboratory Accreditation Conference). The PQL is method, instrument, and analyte specific and may be updated as more data becomes available. The PQL must be below the groundwater protection standard established for that analyte as defined by 30 Texas Administrative Code Section 330.409(h) unless approved otherwise by the TCEQ. The precision and accuracy of the PQL shall be initially determined from the PQLs reported over the course of a minimum of eight groundwater monitoring events. The results obtained from these events shall be used to demonstrate that the PQLs meet the specified precision and accuracy as shown in the table below. The PQL will be supported by analysis of a PQL check sample, which is a laboratory reagent grade sample matrix spiked with chemicals of concern at concentrations equal to or less than the PQL. At a minimum, a PQL check sample will be performed quarterly during the calendar year to demonstrate that the PQL continues to meet the specified limits for precision and accuracy as defined in the table below.

**Table 1 – QC Specification Limits for the PQL and Lower Limit of Quantitation Check Samples**

COC	Precision (% RSD)	Accuracy (% Recovery)
Metals	10	70-130
Volatiles	20	50-150
Semi-Volatiles	30	50-150

For analytes that the established PQL cannot meet the precision and accuracy requirements in the table above, the owner/operator will ensure the laboratory will submit sufficient documentation and information to the TCEQ for alternate precision and accuracy limits on a case by case basis. Non-detected results will be reported as less than the established PQL limit that meets these precision and accuracy requirements.”



**TAB C**



March 2008  
Rev. DRAFT

**SPECIFICATION LIMITS  
FOR  
PRECISION AND ACCURACY  
MEASUREMENTS  
OF THE  
PRACTICAL QUANTITATION LIMIT**

**MUNICIPAL SOLID WASTE PERMITS SECTION  
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY**

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## **PURPOSE**

To provide staff direction regarding the use and interpretation of Practical Quantitation Limits (PQLs) as statistical limits in accordance with 30 Texas Administrative Code (TAC) Section (§)330.405(f) and §330.407(d). This document was developed by the Municipal Solid Waste (MSW) Permits Section to assist staff in applying the rules.

## **RULE REQUIREMENTS**

The MSW Regulation 30 TAC §330.405 addresses the groundwater sampling and analysis requirements for the samples to be analyzed and 30 TAC §330.407 specifies the detection monitoring program's statistical methods chosen to evaluate groundwater monitoring data from an Municipal Solid Waste Landfill Facility (MSWLF).

Specifically, 30 TAC §330.405(f)(5) requires that: "the statistical method shall account for data below the limit of detection with one or more statistical procedures that are protective of human health and the environment. Any practical quantitation limit that is used in the statistical method shall be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the facility."

In addition, 30 TAC §330.407(a)(1) also requires: "the owner or operator shall evaluate the background data to ensure that the data are representative of background groundwater constituent concentrations unaffected by waste management activities or other sources of contamination."

## **DIRECTION**

To fulfill the above mentioned rule requirements, the PQL must be the lowest concentration at which the MSWLF's analytical laboratory can report quantitative data within the specified limits of precision and accuracy.

The MSWLF's laboratory must meet three requirements in order to report meaningful results to the MSW Program.

- The reporting limit for each constituent of concern (COC) will be the analytical laboratory's PQL (with exceptions identified on a case-by-case and/or site specific basis).
- The groundwater monitoring data must demonstrate and document on an ongoing basis the analytical laboratory's ability to quantitate at its reporting limits.
- Documentation must exist to support a change to a higher PQL. This documentation may be requested by MSW Permits Section to support changing the PQL for a given constituent.

## **QUALITY CONTROL (QC) – PQL CHECK SAMPLE**

The use of EPA-approved methods alone does not ensure quality data. Therefore, it is necessary to establish a Performance-Based Measurement System (PBMS) to verify the degree of quality actually attained within the analytical methodology. EPA defines PBMS as a set of processes wherein the data needs, mandates, or limitations of a program or project are specified. The PBMS provides criteria for selecting appropriate methods to meet those needs in a cost-effective manner.

A "PQL check sample" is a laboratory reagent grade sample spiked with verified and/or known amounts of COCs at concentrations equal to the PQL and must be the lowest concentration at which the

MSWLF's analytical laboratory can report quantitative data within the specified limits of precision and accuracy. The PQL check sample is carried through the entire preparation and analysis procedure.

*Measurement of the PQL QC Criteria*

The MSWLF's analytical laboratory will analyze a sufficient quantity of PQL check samples in order to develop their own PQLs and must verify their PQLs over time. Standard, documented procedures will be used for all sample analyses. Reasons for the use of nonstandard procedures must be clearly documented in both the groundwater monitoring data and statistical reports.

**REQUIREMENTS OF THE PQL CHECK SAMPLE**

40 Code of Federal Regulations Part 258.53(h)(5) defines the PQL as "any PQL that is used in the statistical method must be the lowest concentration level that can be reliably achieved within specified limits of precision and accuracy during routine laboratory operating conditions that are available to the laboratory."

A PQL must represent the laboratory's lowest level of quantitation and verified as within the PBMS specified limits. After an MSWLF's representative background concentrations have been established, then the MSWLF can perform detection monitoring using any method capable of quantifying the concentrations at or below established background concentrations.

If the recovery of the PQL check sample is not within the specified limits, then corrective action (e.g., re-calibration) will be taken to meet the specified limits before proceeding with analyses of groundwater monitoring samples. The MSWLF's laboratory must include and report results of the PQL check sample with data submitted to the MSW Permits Section. The PBMS specified limits for the PQL's precision and accuracy are as follows.

**Table – QC Specification Limits for the PQL and PQL Check Samples**

COC	Precision	Accuracy
	(% RSD)	(% Recovery)
Metals	20	80-120
Volatiles	30	65-135
Semi-Volatiles	30	65-135

**Note 1:** In site-specific / case by case instances, sample reporting limits may be set higher than experimentally determined PQLs to make up for sample dilutions, to avoid verified positive matrix effects or interferences from common reagent contaminants, or for reporting convenience (i.e., to group common compounds with similar but slightly different experimentally determined PQLs (xylenes)).

**Note 2:** Estimated results below the PQL must always be reported with a data qualifier (J-flag).

**Note 3:** Non- detected analytes are always reported as less than the PQL.

## **SPECIFICATION LIMITS OF PRECISION AND ACCURACY OF THE PQL**

*For inorganics, ongoing precision and accuracy measurements at the PQL must demonstrate the following criteria.*

- The PQL must be equal to the concentration of the lowest non-zero standard in the calibration curve.
- Recoveries for a PQL check sample must be within  $\pm 20\%$  the true spike concentration amounts.
- Precision must be within  $\pm 20\%$  of the PQL check sample's relative standard deviation measurements.
- The PQL should represent the lowest level of quantitation possible for the analytical method within the specified limits for accuracy and demonstrated precision within  $\pm 20\%$ .
- The PQL used for measuring a COC should be at or below the representative background concentration when continuing to conducting detection monitoring.
- A PQL check sample is a reagent grade sample that is spiked with COC concentrations equal to the PQL and carried through the entire preparation and analysis procedure.

*For organics, ongoing accuracy and precision measurements at the PQL must demonstrate the following criteria.*

- The PQL must be equal to the concentration of the lowest non-zero standard in the calibration curve.
- Recoveries for a PQL check sample must be within  $\pm 35\%$  the true spike concentration amounts.
- Precision must be within  $\pm 30\%$  of the PQL check sample's relative standard deviation measurements.
- The PQL should represent the lowest level of quantitation possible for the analytical method within the specified limits for accuracy and demonstrated precision within  $\pm 30\%$ .
- The PQL used for measuring a COC must be at or below the representative background concentration when continuing to conducting detection monitoring.
- A PQL check sample is a reagent grade sample that is spiked with COC concentrations equal to the PQL and carried through the entire preparation and analysis procedure.

## DEFINITIONS

- Accuracy:** Is defined by the degree of agreement between an observed value and an accepted reference value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations. Accuracy is the degree of agreement of a measurement with an accepted reference / true value. Accuracy is to be expressed in terms of a recovery percentage of the reference / true value.
- COC:** Constituent of Concern, the MSW Groundwater Program requires 40 CFR Part 258 Appendix I constituents for detection monitoring and 40 CFR Part 258 Appendix II constituents for assessment monitoring. Other constituents may be monitored. COCs are sometimes also referred to as analytes.
- Precision:** The agreement among a set of replicate measurements without assumption of knowledge of the true value. Precision is estimated by means of replicate analyses. The PQL check samples should contain concentrations of COCs above the MDL. The estimates of precision are to be expressed as the relative standard deviation (RSD).
- RSD:** A measure of precision, calculated as the standard deviation of a set of values divided by the average, and multiplied by 100 to be expressed as a percentage.

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