

# TRRP Q & A

The following information is taken from questions posed by internal staff and external customers. This document is not intended to cover all aspects of the TRRP rule. Refer to the [TRRP rule and preamble](#) for complete information.

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## Subchapter A General Information

### §350.2 Applicability

**Q). At one facility, can one or more solid waste management units (SWMUs) or areas be closed under the Risk Reduction rule and other SWMUs or areas be closed under TRRP? For example, can soil contamination at a SWMU be closed under the Risk Reduction rule, while a large underlying groundwater plume which is associated with a different source area be closed under TRRP? And finally, could the soil contamination at a SWMU or unit be addressed in response to the Risk Reduction rule while the groundwater plume associated with this same release is managed in response to TRRP?**

**A).** Yes, one or more SWMUs or areas at a facility could be closed in response to the Risk Reduction rule while other SWMUs or areas at that facility are closed in response to TRRP. In particular, the soil contamination at a SWMU or unit could be closed under the Risk Reduction rule and the underlying groundwater plume could be managed under TRRP provided the area of groundwater contamination was sourced from a different SWMU or unit. And the answer to the final question is "no." Soil and groundwater contamination cannot be managed under different rules if they are associated with the same source area unless the conditions set forth in the July 18, 2000 Interoffice Memorandum regarding the "Transition to Texas Risk Reduction Program of projects with portions closed under the 30 TAC 335 Risk Reduction rule" are met. Generally, the soil and groundwater areas of contamination must be evaluated under the same rule, either the Risk Reduction rule or TRRP.

**Q). A RCRA sump is operated at a site that is under an agreed order that requires closure in accordance with RCRA interim status regulations. The sump had a release, and solvents are present above federal maximum contaminant levels. TRRP is to be used for the remediation, and use of monitored natural attenuation (MNA) is anticipated, most likely under Remedy Standard B.**

**Historically, compliance with Standard 2 has been used to determine exit from RCRA post closure care. What TRRP standard and tier do I have to meet to exit from RCRA post closure care?**

**A).** Remedy Standard A will be used to determine exit from RCRA post closure care and permitting. For this purpose, Remedy Standard A can be attained with protective concentration levels established at any tier, just as it can be used for any remediation under TRRP. As with any decontamination remedy, MNA can be used under either Remedy Standard A or B, but the remedial objectives may be different under the two different standards.

**Q). Under the above-described circumstances, would pursuit of Remedy Standard A using MNA require a post closure care permit or a compliance plan?**

**A).** Historically (pre- 30 TAC 335 Risk Reduction rule) the agency has allowed a facility the opportunity to attain "clean closure" before requiring a post closure care permit. This practice continued with the Risk Reduction rule and should continue with the TRRP rule. A compliance plan is part of a hazardous waste permit and similarly shouldn't be imposed until a facility fails to achieve "clean closure" (i.e., typically Risk Reduction Standard 2 or Remedy Standard A). The new issue with MNA, as well as for all remedies, under TRRP is that the remedial time frame must be reasonable given the particular circumstances at the affected property. If insufficient progress is being made, the remedy could have to be changed to another more timely Remedy Standard A solution or to Remedy Standard B. Since both Remedy Standards A and B do not have specific time limits required for attainment, TRRP has a check point at 15 years from the date of the SIN or RAP at which time the agency could require a notice of long-term response action in accordance with §350.31(h). If the landowner will not consent to the notice, then the remediation would need to be completed in less than 15 years. Changing from a Remedy Standard A to a Remedy Standard B approach could trigger post closure care requirements (i.e., post-response action care). To answer the question more directly, pursuit of Remedy Standard A under these circumstances would not trigger post closure care permitting initially and perhaps not for 15 or more years.

**Q). Under the above-described circumstances, would Remedy Standard B using MNA require a post closure care permit or a compliance plan?**

**A).** Unlike the answer for Remedy Standard A, use of MNA under Remedy Standard B could go either way, depending on what use is made of controls. It might be possible to “clean close” under Remedy Standard B if controls were not used. For example, a plume management zone (PMZ) could be established with associated post-response action care, but then later retracted if COCs are ultimately reduced throughout the PCLE zone to the critical PCLs. Or, if the control was only applied to the soils, but MNA was used to restore the groundwater to critical PCLs, then post-response action care may be applicable to the soils, but not to the groundwater. Criteria are specified in §350.33(i) for demonstration when post-response action care is no longer warranted.

MNA may be used in at least two ways under TRRP, as a restoration method or as a control (maintain the limits of the PMZ). Note that §350.33(f)(4)(F) sets up the requirement for monitoring of the area around the PMZ. This monitoring is part of the post-response action care. Sections §350.33(f), (f)(4)(F)(ii)(II), and (f)(4)(F)(iii)(IV) set the requirement for post-response action care for plume management zones. Use of some of the other options for groundwater response objectives might minimize the scope of the post closure care but would then expose the facility to permitting. For example, the waste control unit option is basically a landfill. So even if the groundwater achieves MNA objectives, the remaining waste, in this case the sump, would be subject to post closure care.

**Q). Are there other relevant issues for the above-described circumstances?**

**A).** A post closure care permit is not the only option. EPA recently finalized some rules that allow for orders to serve the same function as a post closure care permit. It is likely that this agency has not adopted this rule yet, so this option may not be available for some time. This facility in question started its response under an order. It might be possible to finish its post closure care requirements under an order.

**Q). We want to dismantle our waste water treatment plant (WWTP). We have been sending wastewater off site instead of treating on site because the on-site system did not work well. The WWTP consists only of RCRA-exempt wastewater treatment tank systems.**

**What are our company's responsibilities regarding closure and site investigation for the closure of a RCRA-exempt unit? For a nonhazardous waste unit? Does the TRRP only require that RCRA-permitted units go through that loop (per 30 TAC 350.2)? Are RCRA-exempt tank systems considered "regulated under Chapter 335" per 305.2(h)?**

**A).** The series of questions are all closely related. Basically, the WWTP tanks are considered to be industrial solid waste management units subject to Chapter 335. If they handle a hazardous waster stream, additional requirements under RCRA could apply. If the tanks are exempt from permitting requirements, they must still meet other RCRA requirements, such as closure although the process is different from interim status units or permitted units. RCRA permitted units are addressed in §350.2(h)(1), which basically means follow the terms of the permit for closure. Once the permit is undergoing renewal, the closure plan will have to be updated to reflect TRRP requirements.

Let's start with Chapter 335. Section 335.8(a) Closure and Remediation, spells out the obligation to close:

“Applicability. The regulations of this section, in addition to other applicable rules, permits, or orders, establish the obligation for persons to perform closures or remediations for facilities or areas containing industrial solid waste or municipal hazardous waste. ...”

This section then directs you to Chapter 350 to fulfill this closure obligation. Section 350.2(h) contains the closure performance standard that applies to all solid waste unit closures:

“The person shall close a waste management facility component in a manner that minimizes or eliminates the need for further maintenance and controls. The manner of closure shall also minimize or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of waste, contaminants, leachate, run-off, or decomposition products to the surrounding environmental media.

Waste management facility components undergoing closure for which the person can demonstrate that no release of COCs to surrounding environmental media has occurred are subject to this chapter only with regard to this closure performance standard and the removal, decontamination or control requirements for waste as specified in Subchapter B of this chapter (relating to Remedy Standards). In the event a release of COCs to surrounding environmental media has occurred, then the person shall comply with this chapter for response to the release.”

This text is the basic requirement for closure. Section 350.2(h)(2) tells you to also comply with other RCRA requirements, if applicable. So, closure under TRRP divides into two paths - Closure without release and Closure with release. If you can show that the WWTP tanks have not released to surrounding environmental media, closure means removing or decontaminating the tanks to meet the basic performance standard. If there has been a release from the tanks, apply the same performance standard to the tanks and also attain Remedy Standard A or B for the impacted media to demonstrate protection of human health and the environment. If unit-specific requirements for closure of RCRA facilities apply, such as for tanks, those requirements must be met also.

**Q). Must a RCRA facility still conduct groundwater monitoring or post closure care at a hazardous waste management unit even if a release of COCs is below TRRP cleanup levels?**

**A).** Yes. The person must comply with any regulations of the RCRA program, provisions of a hazardous waste permit or order that apply to the release site. In §350.2(a) TRRP states that "...the regulations in this chapter do not eliminate the need for the person to meet any more stringent or additional requirements found in the particular rules for the covered program areas or applicable federal requirements." More directly, §350.2(h)(2) links the requirements for hazardous waste management units back to the hazardous waste rules in Ch. 335 for closure and post closure care. So the basic requirement to conduct post closure care and groundwater monitoring for a closed landfill, for example, is not affected by TRRP. TRRP can be used to carry out some of the requirements.

**Q). What aspects of RCRA groundwater monitoring, closure and post-closure care can be satisfied by using the TRRP rule?**

**A).** The requirements are many and varied. The interested person conducting closure or response actions at hazardous waste management units should closely examine the guidance document *TRRP Compatibility with RCRA* (RG 366/TRRP-3) which addresses this question in detail. Let's look at a fairly typical situation using RCRA groundwater monitoring requirements as an example. A closed hazardous waste landfill must have a groundwater monitoring program as part of its RCRA post closure care requirements. The monitoring program can be in one of three different phases: detection monitoring, compliance monitoring, or corrective action.

- In detection monitoring, the person must sample semi-annually for a series of constituents that serve as indicators of a release. This phase of monitoring can continue for the entire 30-year post-closure care period if a release is not detected. Measured concentrations are compared to background concentrations using a statistical technique. A statistically significant difference over background is the signal that a release could have been detected and that additional verification testing is needed, including analyzing for all hazardous constituents. If a release of hazardous constituents is verified, the landfill is then put under the compliance monitoring phase. Note that TRRP is not utilized in any way during the detection monitoring program since no release has occurred.
- In compliance monitoring, the person must sample quarterly for a subset of hazardous constituents that have been confirmed in the release, and annually for all hazardous constituents. Measured concentrations are compared to the concentration limits specified in the groundwater protection standard. The concentration limit for a particular hazardous constituent can be based on one of three values: the background level of the hazardous constituent, a federal drinking water standard such as an MCL or an alternate concentration limit (ACL) which can include TRRP PCLs. The landfill could remain in compliance monitoring if the concentration limits are never exceeded. Under TRRP alone, this landfill would not have a PCL exceedence zone and a remedy would not be required. However, under RCRA the compliance monitoring program must continue for the duration of the compliance period. If the concentration limits are exceeded, the landfill is then put under the corrective action phase.
- In the corrective action phase, the person must apply a remedy to regain compliance with the groundwater protection standard. TRRP can be used in this phase to its full effect since a PCL exceedence zone exists and must now be addressed. The release can be addressed with TRRP remedy standard A or B, using

PCLs or Attenuation Action Levels as the cleanup criteria. Various RCRA requirements, such as time frames, reporting frequency, COCs to be sampled, amount and duration of financial assurance, etc., must still be met even though the technical performance requirements are being addressed with TRRP. The Compliance Plan, issued by the Commission as part of the hazardous waste permit, is the formal approval mechanism for corrective action at a hazardous waste unit subject to permitting. The Compliance Plan will specify all applicable RCRA and TRRP requirements.

**Q). What is the interrelationship between the Risk Reduction rule and TRRP in this example? A JP-4 spill occurred in 1994. A notice of violation/corrective action directive was issued by the TNRCC. The release resulted in soil and groundwater impact on off-site property. The responsible party has been conducting soil and groundwater remediation at the site in accordance with the Risk Reduction rule. In December 2000, there was a second release with a different chemical composition that occurred in the same area. Which rules should apply to address final remediation of the commingled soil and groundwater contamination?**

**A).** The person has two options for responding to these releases. First, the person may continue to respond to the 1994 release under the Risk Reduction rule and begin a response for the December 2000 discharge under TRRP. This may be a feasible approach since the second release had a different chemical composition than the first release. Even though the releases occurred in the same area, due to the different chemical composition of the releases, the person may be able to distinguish that soil and groundwater which must be addressed under the Risk Reduction rule versus TRRP. As a second option, the person may choose to address both releases under TRRP. The person does not have the option of responding to both of the releases under the Risk Reduction rule.

The justification for this response is provided in §350.2(m) regarding the use of TRRP on or after May 1, 2000. It states that a person who has started a response action under the Risk Reduction rule may qualify to continue under those rules. The actions to address the December 2000 release cannot be considered part of the original response action for the 1994 release. Assuming proper notification, the response action for the 1994 release is all that has been grandfathered. The December 2000 release could not have been grandfathered on or before May 1, 2000. Instead, the December 2000 release must be considered subject to regulation under TRRP.

### **§350.2(h) Applicability**

**Q). What is the criteria for determining the need for a RCRA post closure care permit for a RCRA/interim status unit using TRRP? Under the Risk Reduction Rule, compliance with Standard 2 was an exit from RCRA. What is the comparative exit from RCRA under TRRP?**

**A).** As for what in TRRP will constitute a "clean closure" (i.e., no further need for permitting under RCRA) type exit out of RCRA, Remedy Standard A (either residential or commercial/industrial land use) will suffice. This standard does not allow use of control remedies and hence does not require any post closure care or financial assurance. It might be possible to do clean closure under Remedy Standard B if no controls are used, but then it is practically a Standard A.

### **§350.2(h)(3) Contained-In Policy**

**Q). Now that TRRP is in effect, is there still a "contained-in" policy to make hazardous waste determinations?**

**A).** Yes. It is based on a series of memos prepared by EPA over the years. It has only been codified in the "debris rule." Although it was proposed in the HWIR Media rule, it didn't make it into the final version. You can find a handy description of the EPA policy in "Management of Remediation Waste Under RCRA", EPA 530-F-98-026, Oct. 1998. Our version for the 1993 Risk Reduction rule is described in the Jan. 14, 1998 memo, but this memo has been superceded by the TRRP rule.

**Q). How does one determine the values below which a contaminated media can be said to no longer be a listed hazardous waste?**

**A).** Since May 1, 2000, you will be using the TRRP rule to make contained in determinations, as stated in §350.2(h)(3). You can use the Tier 1 PCL Lookup Tables or develop PCLs using Tier 2 or 3. Take the lowest value for the various pathways applicable to a given environmental media (critical PCL), just as with the 1993 Risk Reduction rule Standard 2 MSCs. Expanded guidance will be included in the TRRP-3 guidance document on Compatibility with RCRA. The criteria of §350.72 regarding cumulative risk and hazard must be met as well.

**Q). Is the policy self-implementing or do you need "approval" from the Agency?**

**A).** The TRRP-3 guidance will indicate that Tier 1 determinations can be self-implemented. Tier 2 or 3 applications will have to be proposed to the agency in advance for approval.

**Q). What does the "contained-in" policy refer to?**

**A).** Bear in mind that the contained in policy applies to media (soil, groundwater, etc.). It does not apply to waste which is being removed from a waste management unit for disposal.

### **§350.2(m) Applicability**

**Q). I have a site that is a former wood treatment/ creosoting site that was closed as a landfill. The closure plan was approved in 1988 and the landfill was capped and deed recorded in 1990. Therefore, the soils were closed prior to the adoption of the 30 TAC 335 Risk Reduction rule. The closure plan included a groundwater recovery and treatment system, but due to delays (for various reasons), the groundwater treatment system has not yet been installed. In addition, the extent of groundwater contamination has not yet been delineated. The original proposal to conduct a groundwater recovery program was based on background cleanup objectives. Since the closure plan was submitted and approved prior to the June 28, 1993 effective date of the Risk Reduction rule, this site has been continuing under the pre-Risk Reduction rule objectives of clean to background or close as landfill. In the meantime, we have been submitting groundwater monitoring data and recently compared these results with the TRRP Tier 1 PCL tables.**

**At this point, it would be very difficult, if not impossible to find any old data to demonstrate that the landfill soils could meet TRRP requirements. The question is, can I remediate and close the groundwater medium under TRRP?**

**A).** This case could qualify for the conditions of the July 18, 2000 memorandum mentioned in the first question above. Even so, we believe it is possible in this case to accept the previous soil closure action for TRRP compliance with a minimal amount of additional data gathering. We could accept the landfill closure as suitable for Standard B because of prior agency approval under a more stringent requirement (i.e., closure to background). If you can provide information showing that the cap is of sufficient size to cover any COCs above background, you would only have to assess surface soils around the cap instead of under or through the cap. See §350.51(a) for the provision regarding assessments at existing physical controls to be used for Standard B purposes. Vapor emissions might need to be checked. This could be done qualitatively by examining the PCL tables for the various COCs and determining the likelihood for vapor generation. Since the heavily contaminated soils were closed in place, the entire soil column under the cap could be declared a PCLE zone without additional vertical delineation of COCs. The point of exposure for groundwater could be moved to the edge of the cap by declaring the landfill to be a waste control unit, if it meets the definition for waste control unit at §350.4(a)(91), and utilize the waste control unit option for groundwater at §350.33(f)(2). The original deed record filed on this site would have to be evaluated against the requirements of the TRRP rule, specifically with regard to preventing use of the groundwater. For the rest of the affected property beyond the waste control unit, the other groundwater response objectives of TRRP would have to be met. This can include the plume management zone option. If the landfill

closure does not qualify as a waste control unit, it can be considered as an existing physical control without as many options available to it. All of these options under TRRP will require post response action care and financial assurance for the physical control. You will have to weigh your options. There are advantages to using the TRRP rule, noted here, that can get you to administrative closure (i.e., a conditional no further action letter) sooner than remaining under the old plan.

Lastly, the use of the Tier 1 PCL tables for comparison to the groundwater monitoring data is inappropriate while remaining grandfathered from the TRRP rule. Commit to first comply with the TRRP rule by making the necessary conforming changes to the closure plan.

**Q). Do the notice requirements of §350.2(m) to maintain grandfathered status apply to facilities performing closures or remediations in response to an order or permit?**

**A).** No, generally speaking. The applicability of the TRRP rule can be limited in situations involving closures or remediations that are covered by other requirements. This is indicated in the rule at §350.2(a), §350.2(h)(1), and §350.31(a), among other places. A facility under an enforcement order that specifies the use of the Chapter 335 Risk Reduction Rules or other rules must adhere to that order, even if the closure or remediation extends past the TRRP applicability date of May 1, 2000 and subsequent grandfathering milestones. Since the agency directed the facility to use a specific regulation or alternative approach, the facility does not need to notify the agency of its intention to remain under pre-TRRP rules. In contrast, facilities without an order or permit were given a choice of which set of rules to use to complete their closure or remediation. Provided they meet the milestones in §350.2(m)(1) or (2), grandfathering is automatic. Facilities could use the optional Notice Of Intent (NOI) reporting form to ensure that agency records are clear as to their grandfathering status.

The TRRP rule was structured in §350.2(m)(4) to allow facilities to convert to the TRRP rule, unless such action would result in noncompliance with a previously approved schedule of compliance. In the case of enforcement orders, this means the facility will have to request that the agency modify its order to specify use of the TRRP rule and reset compliance schedules. Reproduced below is pertinent text from the TRRP preamble regarding grandfathering of facilities under an order:

“Regarding §350.2(m)(4), this provision allows a person to voluntarily comply with this chapter, even if originally grandfathered, with exception for situations that would result in noncompliance with a previously approved or imposed schedule of compliance. This can be the case with enforcement orders that mandate specific actions and delivery of work plans and reports by specific time frames. The degree of prescriptiveness of enforcement orders has been variable over time, so the commission is not attempting to provide a specific requirement for grandfathering these projects. The commission instead will evaluate such issues on a case specific basis. For example, if an enforcement order issued prior to the implementation date of this chapter directed a person to respond to a release in accordance with the current Risk Reduction rule of Chapter 335, the commission will in general view this as a grandfathered action. Excessive delay on the person’s part in carrying out the ordering provisions could result in additional enforcement action and possible loss of grandfathered status. It would be appropriate for a revised order or directive issued after May 1, 2000, to require compliance with this chapter. On the other hand, persons seeking to utilize this rule, even if ordered to follow Chapter 335, can request a modification to the order and time frames so as to accomplish this change in status. The rule has been amended at §350.2(m) to correct the format for the Chapter 335 Subchapter A and S reference.” (From 24 TxReg 7504, 9/17/99)

Additional guidance is provided in the March 2000 draft of TNRCC Regulatory Guidance RG-366/TRRP-2 “TRRP Applicability and Grandfathering” which is available on the web at <http://www.tnrcc.state.tx.us/permitting/trrp.htm>.

**Q). What constitutes adequate notice for grandfathering when there is not an order or permit?**

**A).** For closures or remediations not required by an order or permit that started under the Chapter 335 risk reduction rules prior to May 1, 2000, persons should have notified the agency indicating their intentions to achieve the risk reduction standards by providing the information listed in §335.8(c)(1). Please note however, that the provisions of §335.8(c)(1) may not be a definitive statement encapsulated in a single plan or report, but may be

based on intent as evidenced by plans and reports submitted to the agency. If self-implementing under standard 1 or 2, this notice could be as little as a letter submitted to the central and regional offices at least 10 days in advance of starting the action. A work plan submitted for review and approval can also serve as notice if it contained the information listed in §335.8(c)(1). Further, if the TNRCC has been receiving and reviewing and responding to plans and reports and based on report types and content it is obvious intentions are to fulfill the requirements of Remedy Standard 3, for example, then that should be considered as substantially fulfilling the intent of §335.8(c)(1).

Some actions that pre-dated the 1993 risk reduction rules were automatically grandfathered under those rules and are continuing under that status to this day. The notification requirements of §335.8(c)(1) do not now and never did apply to those actions. Similarly, they are not subject to the TRRP rule (think of it as being “great-grandfathered”) unless a change of circumstances should occur as stated in revised §335.8(a)(3) which then refers to §350.35 to bring that action into TRRP.

With the promulgation of the TRRP rule in 1999, grandfathering of projects started under the Chapter 335 risk reduction rules is automatic provided proper notification according to §335.8(c)(1) had been made prior to May 1, 2000 and other milestones are met. If a person has any doubt about the grandfathered status of a closure or remediation, he has until May 1, 2001 to set the record straight. This can be accomplished by showing a letter from the agency acknowledging receipt of their notice, if the program area issued such letters, or alternative methods of documentation can be submitted, such as postal records or proof of entry in a TNRCC tracking system. Another example can be the verification document produced by a facsimile transmission which shows the date and time of transmission and a reproduction of a portion of the document.

## **§350.2(m)(2) Grandfathering under Risk Reduction Rules**

**Q). I have been pursuing cleanup under Standard 3 of the Risk Reduction rules as allowed by the grandfathering provisions of §350.2(m)(2). Under what circumstances would the TNRCC revoke my grandfathered status and require me to switch to the TRRP rule?**

**A).** To retain grandfathered status for use of Risk Reduction Standard 3 of the Risk Reduction rule (30 TAC Chapter 335, Subchapters A and S), you must have submitted a remedial investigation report prior to May 1, 2001, in accordance with §350.2(m)(2) of the Texas Risk Reduction Program (TRRP) rule. The remedial investigation report must fully comply with §335.553(b)(1) of the Risk Reduction rule. The TRRP rule does not provide for the TNRCC to grant a deadline extension or to otherwise waive that rule requirement. However, the preamble to the final TRRP rule provides some guidance on TNRCC expectations regarding this requirement. Pertinent text of the September 17, 1999 edition of the *Texas Register* (24 *TexReg* 7503) is reproduced below. Also included is a series of questions addressing different scenarios to help clarify this requirement.

1. What happens if I never submitted an investigation report before May 1, 2001?

Unless required by an order or permit to conduct the closure or remediation in accordance with the Risk Reduction rule, you must comply with §350.2(m)(2) to preserve grandfathered status. Failure to turn in the required report prior to May 1, 2001 precludes grandfathered status for failure to comply with §350.2(m)(2). If no investigation report has been submitted prior to May 1, 2001, then there is no potential for retaining grandfathered status. Note: See TNRCC guidance document *TRRP Applicability and Grandfathering* (RG-366/TRRP-2) [http://www.tnrcc.state.tx.us/admin/topdoc/rg/366\\_trrp\\_02.pdf](http://www.tnrcc.state.tx.us/admin/topdoc/rg/366_trrp_02.pdf) for explanation of the grandfathered status established by order or permit.

2. If I have turned in my report prior to May 1, 2001, but the TNRCC has not reviewed it prior to the deadline, can I get an extension to the deadline?

There is no provision in the TRRP rule for an outright extension to the deadline prior to review of the investigation report by agency staff. Such extensions will not be given because they are not necessary. Upon its review, the report will be evaluated with regard to its substantial completeness and whether it is appropriate to allow you to

respond to an NOD to retain grandfathered status. Note that the preamble states "...the TNRCC review letter will be sent in as timely a manner as possible. Not receiving such a letter prior to the one year deadline does not affect a person's status." In this example the requirement to submit the investigation report prior to the deadline has been met. As with the situations in Questions 3 and 4, your status is not affected until the agency completes its review, even if the review process begins after May 1, 2001.

3. What if I did submit an investigation report prior to May 1, 2001, but the extent of the contamination is not defined? Asked another way, if I make a good faith effort to delineate the contamination, but receive a Notice of Deficiency (NOD) after May 1, 2001, will I be given the opportunity to perform additional delineation or will I be directed into TRRP?

To satisfy §350.2(m)(2), you must submit an investigation report prior to May 1, 2001 that will fully comply with §335.553(b)(1). Defining the extent of contaminants is just one of the requirements. According to the preamble (reproduced below), the TNRCC will afford you at least one opportunity to respond to deficiencies in the report. This approach is consistent with normal agency practice for reviewing reports. However, the amount of additional delineation that will be acceptable will be a case-specific determination. The intent is to enable facilities with complete or nearly complete investigation reports to provide some small amount of additional information that is lacking. The intent is not to extend grandfathered status to facilities where the remedial investigation report is substantially incomplete.

4. If the TNRCC sent me an NOD asking for more investigation in response to an investigation report submitted before May 1, 2001, what if the deadline for responding to the NOD (usually 60 to 90 days) extends beyond the May 1, 2001 grandfathering date?

As noted in the preceding response, issuance of an NOD for small amounts of additional information is allowable without jeopardizing your grandfathered status. The May 1, 2001 date is the deadline prior to which you must have submitted the investigation report. There is not a deadline specified in the TRRP rule for completion of the agency review and response process, however, the agency management has set deadlines by which the programs must complete reviews of documents. So for this scenario, grandfathered status can be preserved unless the reviewing program ultimately determines that the performance standard has not been met.

5. I submitted an investigation report before May 1, 2001, and the TNRCC sent an NOD asking for more investigation. I have been challenging the requested investigation actions for some time, and now the deadline has passed. What could happen now?

Concerning deadlines, the same comments as the preceding questions will apply here. If the report was not substantially complete, then the deadline has lapsed. The reviewing program should follow the normal practice for dealing with disputed issues. If after a reasonable period of negotiation without resolution and it is clear that the TNRCC remains firm on the requested additional work, the reviewing program should consider the deadline to have lapsed and grandfathered status will be lost. The intent of grandfathering actions is to allow facilities that have already made sufficient progress (i.e., completed the investigation) to continue under previous rules so as not to delay timely and efficient remediation. Of course, referral for enforcement, rejection from the Voluntary Cleanup Program, etc., are additional options for the reviewing program to consider.

6. I submitted an investigation report before May 1, 2001, and the TNRCC sent an NOD asking for investigation that includes off-site areas. I've encountered delays in getting off-site access that have extended beyond May 1, 2001. How does that affect my grandfathered status?

Again, concerning deadlines, the same comments as the preceding questions will apply here. The lack of access to off-site property is a deficiency of the investigation report. The reviewing program should evaluate the deficiency on a case-specific basis, considering such factors as the probable extent and severity of the off-site portion of the release. If you are close to compliance, the TNRCC can allow a reasonable time to respond to the NOD. If, on the other hand, existing data indicate the off-site portion of the release is likely to be large or more severe relative to the on-site portion such that the investigation is substantially incomplete, you will be directed to comply with TRRP.

7. I have submitted an investigation report before May 1, 2001, and received an NOD asking for more delineation. In response to the NOD I have submitted an investigation report addendum with additional investigation results. The TNRCC sent another NOD because the new data still does not demonstrate that the contamination is defined. What happens if this situation continues into another round of NOD and report addendum?

Note that the preamble indicates the TNRCC will allow at least one opportunity to respond to Notices of Deficiencies. If you are very close to compliance after the first NOD response, the intent here is to allow you to finish the investigation. Also recall that the intent of grandfathering is to allow investigations that are substantially complete but lacking some information to be finished. This intent was published in the final TRRP rule preamble on September 17, 1999. You have had more than 18 months to prepare for this deadline. An investigation report that requires multiple addendums after May 1, 2001, probably was not sufficiently complete as of the deadline to meet the intent let alone the letter of §350.2(m)(2). In this scenario, you likely will be directed to comply with TRRP.

8. I have delineated the contamination on-site by the May 1, 2001 deadline but I noticed a spike in concentrations in a perimeter well due to increased rainfall or drought after May 1, 2001. Can I perform the additional delineation under the Risk Reduction rules or will I automatically be transferred to TRRP?

If the investigation was considered to have been completed before May 1, 2001, based on the data available at that time, then the grandfathering deadline has been met. You can perform the additional delineation under the Risk Reduction rule. If the release had been adequately investigated and reported to preserve grandfathered status, you are directed by §335.8(b) to achieve one or more risk reduction standards. The complete assessment information is needed to prepare an adequate baseline risk assessment or corrective measure study (§335.553(b)(2) and (3), respectively). The new information can be included in one of these reports. After attainment of a risk reduction standard, you are then directed by §335.8(b)(5) to respond on a continuing basis in the event of a substantial change in circumstances. However, if the situation in this example occurs after the risk reduction standard is attained, the spike in concentrations would be evaluated to determine if it constitutes a substantial change. If so, the closure or remediation would be reopened under the TRRP rule to determine if additional response actions are needed.

9. I am monitoring groundwater according to a Risk Reduction Standard No. 3 Alternate Concentration Limit (ACL). The contaminant plume begins to grow after the May 1, 2001 deadline, and additional delineation is required. Can I perform it under the Risk Reduction rules?

If the investigation was considered to have been completed before May 1, 2001, then yes the site may remain under the Risk Reduction rule. In this particular scenario, the ACL represents a concentration that if exceeded is intended to trigger a response, be it additional extent determination, start up of a groundwater recovery system, placement of physical controls or other contingent actions approved as part of the Risk Reduction Standard 3 closure or remediation. You can perform the additional delineation under the Risk Reduction rule in response to §335.8(b)(5) so long as it is part of the approved contingent actions. Note, however, that if the ACL has been exceeded because of a new release from elsewhere at the facility or a subsequent release from the original source that was the subject of the Standard 3 closure or remediation, you must address the resulting commingled releases under TRRP.

10. If I choose to install additional wells in the interior of the plume, even though the lateral extent of contamination has been defined, will this affect my grandfathered status under the Risk Reduction rules?

As with the two previous questions, if the investigation report is complete as of the deadline, then your grandfathered status is secured and additional wells can be installed. Additionally, wells can be installed as part of a remedy (e.g., monitor wells or recovery wells) without affecting the grandfathered status. On the other hand, if the wells are needed to satisfy the other requirements of §335.553(b)(1), such as nature, direction, rate of movement, volume, composition and concentration of contaminants, then the requirements for maintaining grandfathered status have not been met. As discussed elsewhere, however, you may be able to install these additional wells in response to an NOD and still retain grandfathered status.

11. My efforts to delineate an offsite release have been hampered by delays while gaining access to the offsite property. Is it possible to get an extension to the deadline?

You should have submitted what information was available as of the deadline date. Your investigation report will then be evaluated in the manner described in Question 6. Provided that the outcome of the review warrants an NOD, the TNRCC will also consider certain limiting circumstances in developing a reasonable time frame for response to an NOD, such as litigation or bankruptcy proceedings wherein you could not have negotiated access agreements directly with the off-site property owners.

Excerpt from Preamble (24 TexReg 7503)

Regarding §350.2(m)(2) as it relates to risk reduction Standard 3 projects, the commission has revised this paragraph to establish the grandfathering criterion as submission of the final remedial investigation report that satisfies §335.553(b)(1), and has also added a time frame of one year from the implementation date (May 1, 2000) of this rule by which time persons must submit the final remedial investigation report to qualify for this status. This transition period will enable persons with investigations nearly complete to finish them. It also affords the person an opportunity to evaluate more fully the ramifications of converting to this chapter or remaining under Chapter 335. This will also more closely parallel the approach for Standards 1 and 2. No specific request must be made for grandfathered status. The TNRCC will affirm the grandfathered status in a letter issued to the person as reviews are completed acknowledging that the final remedial investigation report satisfies the requirements of §335.553(b)(1). Given the extent of information provided in a typical final remedial investigation report, the TNRCC review letter will be sent in as timely a manner as possible. Not receiving such a letter prior to the one year deadline does not affect a person's status. In keeping with the TNRCC's normal practice, the person will be afforded at least one opportunity to respond to deficiencies in the report before a directive to comply with this chapter would be issued. Since Standard 3 projects are not subject to self-implementation, the person should not automatically proceed to the next step without first determining its status. The commission notes that under the current Risk Reduction rule the three reports of §335.553(b) can be combined into one submittal for review and approval. This can be done, for example, for a no further action proposal under Standard 3 by combining the remedial investigation report with the baseline risk assessment and corrective measure study. If in the TNRCC's review of a combined report, the investigation is found to be satisfactory, even after a response to a notice of deficiencies, the rest of the combined report will be reviewed under Chapter 335. If the investigation report after the response to a notice of deficiencies is still found to be unacceptable, the TNRCC will direct the person to conform to this chapter for all aspects of the no further action proposal.

Some commentors recommended the criterion for grandfathering merely be the initiation of a remedial investigation, or even the submission of a work plan that contemplates compliance with Standard 3. The commission disagrees with the recommendations. Investigations in progress are often adjusted in response to unexpected conditions or new data acquisition objectives. They are also performed in phases to allow for evaluation or oversight. Since the extent of the release is to be investigated to background limits under the current Risk Reduction rule, the first objective is often to find the edge of a plume. Accomplishing this should be sufficient for PCL-based assessments under this rule. The commission notes that transition to TRRP during the investigation stage will be less disruptive to projects trying to achieve timely and efficient remediation than if it were required at later stages of the corrective action process.

Some variations to the conventional RCRA corrective action process need clarification with regard to grandfathered status. Some remedial investigations have been performed in phases. Phase 1 typically is designed to determine if a release has occurred from a SWMU. Subsequent phases then determine the extent of the release in a "step-out" fashion away from the SWMU. Often, results of these phases have been submitted to the TNRCC as separate reports. This approach, while providing a high degree of oversight, has protracted the corrective action process. Streamlining initiatives were put into place by 1996 to compress this process by eliminating intermediate work plans and reports. The commission does not intend to give grandfathered status to phased investigations if the requirements for final remedial investigations are not achieved and reported to the TNRCC by May 1, 2001. Another approach often employed at facilities performing corrective action for multiple SWMUs is the grouping of a subset of SWMUs into distinct projects that progress on different schedules. The grandfathered status will be applied on a SWMU-by-SWMU or project-by-project basis. The status of a single SWMU does not extend to the entire facility. For example, if a facility had ten SWMUs but had completed the remedial investigation on only one SWMU, only that one SWMU would be grandfathered. Similarly, if three

SWMUs had been grouped together as a project and the remedial investigation was complete for that project but not others, only that project would be grandfathered. The remaining SWMUs or projects at the facility would not receive grandfathered status.

### **§350.4(a)(7) Definition of bedrock**

**Q). Is weathered bedrock treated as a soil or bedrock? In §350.4(a)(7) the definition of bedrock seems to hinge around the ability to manually excavate the material. By this definition, the weathered limestone directly beneath the clay soil at the site I'm reviewing would seem to meet the definition of "bedrock."**

**A).** To answer this question we must review the following definitions:

Bedrock (§350.4(a)(7)) - The solid rock (i.e., consolidated, coherent, and relatively hard naturally formed material that cannot normally be excavated by manual methods alone) that underlies gravel, soil or other surficial material.

Surface soil (§350.4(a)(88)) - For human health exposure pathways, the soil zone extending from ground surface to 15 feet in depth for residential land use and from ground surface to 5 feet in depth for commercial/industrial land use; or to the top of the groundwater-bearing unit or bedrock, whichever is less in depth. For ecological exposure pathways, the soil zone extending from ground surface to 0.5 feet in depth.

Subsurface soil (§350.4(a)(86)) - For human health exposure pathways, the portion of the soil zone between the base of surface soil and the top of the groundwater-bearing unit(s). For ecological exposure pathways, the portion of the soil zone between 0.5 feet and 5 feet.

By examining these definitions, you can see that the entire soil zone from the land surface to the top of the groundwater-bearing unit consists of surface soils and subsurface soils. The term "soil" is used broadly and inclusively. Soil is mentioned in the definition of bedrock to connote unconsolidated or un lithified material. The definitions of surface and subsurface soils bring in the context of unsaturated or vadose zone material. Therefore, if the "weathered bedrock" meets the performance criteria for solid rock (i.e., consolidated, coherent, and relatively hard naturally formed material that cannot normally be excavated) and is above the top of the groundwater-bearing unit, then the material would be a "subsurface soil." However, if the material described as "weathered bedrock" does not meet the solid rock criteria; is above the groundwater-bearing unit; and is less than 15 or 5 feet in depth for residential or commercial/industrial land use, respectively, then the material for purposes of TRRP regulation would be "surface soil."

**Q). Are materials or bedrock located below the top of a groundwater-bearing unit considered to be soils under TRRP? Under TRRP do PCLs apply to this material below the top of a groundwater-bearing unit?**

**A).** If the material or bedrock is located below the top of the groundwater-bearing unit then it does not meet the definition of either surface soil or subsurface soil as specified at §350.4(a)(86) or (88), respectively. However, while not being surface or subsurface soil, material below the top of the groundwater-bearing unit would still be considered soils under TRRP. Typically, TRRP is focused on surface and subsurface soils; however, §350.51(d)(1) compels you to perform a deeper assessment under certain circumstances. You are required to either (1) characterize the vertical limit of COCs in soil which exceed the higher of the method quantitation limit or background concentrations or (2) if a groundwater assessment has been conducted, characterize the vertical limit of COCs in soil which exceeds the <sup>GW</sup>Soil PCL. This assessment requirement applies to all soils, not just surface and subsurface soils. Also, this section states "The vertical extent of the soil assessment shall continue beyond the uppermost groundwater-bearing unit as appropriate based upon the likelihood that COCs have migrated deeper considering the chemical and physical properties of the COCs (e.g., dense non-aqueous phase liquids) and the hydrogeology of the affected property." And finally, §350.71(c)(8) requires you to develop PCLs for other exposure pathways, beyond those specifically identified in the rule, which are complete or reasonably anticipated to be completed. Thus, you could be required to develop PCLs for deeper soil with the objective of protecting groundwater, for example.

### **§350.4(a)(40) Definition of groundwater-bearing unit**

**Q).** The piezometric surface during certain times of the year can be as high as or higher than the soil-bedrock interface. The duration of the high piezometric period is dependent upon precipitation. At one particular time of year, the piezometric surface is 0.5 to 3 feet above the top of the mapped bedrock surface, resulting in springs and seeps. Also, the piezometric surface can drop below the top of the bedrock unit during drier parts of the year. However, continuous pressure transducer readings in monitor wells located across the site have shown that the piezometric surface rises almost instantly in the groundwater-bearing unit after rainfall events. Is the limestone a groundwater-bearing unit? Where is the top of the groundwater-bearing unit in those situations where the elevation of the saturated zone varies with the seasons?

**A).** A groundwater-bearing unit is defined in §350.4(a)(40) as a saturated geologic formation, group of formations, or part of a formation which has a hydraulic conductivity equal to or greater than  $1 \times 10^{-5}$  cm/sec. Hydraulic conductivity is the sole criterion to determine if a particular saturated interval is a groundwater-bearing unit or is evaluated as soils under TRRP. Thus, if the bedrock is saturated and has a hydraulic conductivity equal to or greater than  $1 \times 10^{-5}$  cm/sec then it is a groundwater-bearing unit. In those circumstances where seasonal variability is an issue, the top of the groundwater-bearing unit is determined based upon the average annual elevation of the top of the saturated zone. Materials above the top of the groundwater-bearing unit are analyzed as surface or subsurface soils, as applicable.

## Subchapter B Remedy Standards

### §350.31 Remedy Standards

**Q). How should a TRRP response action be described? For example, suppose an affected property is remediated to attain Remedy Standard A for residential land use and Tier 1 was used to determine the protective concentration levels. What short-hand description should be used to describe this type of response action?**

**A).** The type of response action is defined by combining the remedy standard attained with the relevant land use. In the example given, this could be stated as either “Remedy Standard A for residential land use” or “Residential Remedy Standard A.” In either case, it is not necessary and is, in fact, misleading to state the tier which was used to determine the protective concentration levels, for example, Tier 2 Residential Remedy Standard A. Stating the tier within the name of the type of response action leaves the impression that there would be differences in the regulatory requirements between say a Tier 1, 2, or 3 Residential Remedy Standard A. This is not the case. Also, stating the tier when describing the type of response action could be taken to mean that all protective concentration levels for all chemicals of concern at an affected property must be determined in accordance with a particular tier. This is not the case. All three tiers may be used to determine protective concentration levels at an affected property. Therefore, the tier should not be stated in the name of the type of response action. Under TRRP, the name for the type of response action is based solely on the remedy standard and the land use.

### §350.31(f) RACR Submittals

**Q). Do I have to submit a SIN and a RACR along with the APAR for a Remedy Standard A closure, even though no response action is required because COC concentrations are less than the critical PCLs?**

**A).** The answer depends upon whether other applicable rules, orders, permits, or statutes require a release to be reported and also establish the obligation for a response action to be conducted. If such a response action obligation is established and the program area is subject to TRRP, as described in §350.2(b), then you must perform a response action which is fully compliant with the TRRP rule. This process as described in §350.2(a) reads in part that “The rules in this chapter specify objectives for response actions for affected properties and further specify the mechanism to evaluate such response actions once an obligation is established to take a response action via other applicable rules, orders, permits or statutes.”

Once the obligation to perform a response action under TRRP has been established, you must submit the TRRP reports identified in §350.91-.96 (i.e., APAR, SIN, RAER, RAP, RACR, and PRACR) which are applicable for a particular affected property.

Also, the definition for “response action” as presented at §350.2(a)(75) has a more encompassing meaning than common usage. A response action is defined as “Any activity taken to comply with these regulations to remove, decontaminate and/or control (i.e., physical controls and institutional controls) chemicals of concern in excess of critical PCLs in environmental media, including actions taken in response to releases to environmental media from a waste management unit before, during, or after closure.” A site assessment or investigation would certainly be considered an activity taken to comply with these regulations to remove, decontaminate and/or control COCs. Thus, a site assessment, even if it is documented that no further action is required at a site, would in itself be considered a response action.

In the circumstance where an affected property assessment is performed and reveals that none of the COC concentrations are in excess of the critical PCLs for that affected property, you would be required to submit an APAR to the agency for approval. The requirement for you to provide an APAR is presented at §350.51(a). Provided that the agency concludes that the APAR was properly performed, the project would terminate at that point. No SIN, RAP, or RACR would be required since further response actions are not going to be conducted.

Because the project is terminating at the APAR report, some additional information may be required pursuant to §350.91(b)(15) which would normally be contained in later reports. For example, if any institutional controls (e.g., commercial/industrial land use or exposure area variations) are required, then the filing of these institutional controls pursuant to §350.31(g) and §350.111 must be documented in the APAR. You must also document in the APAR the disposition of any assessment wastes, as is required at §350.91(b)(15) or §350.95(a)(3). We encourage combining multiple reports into one when feasible. For example, if you self-implemented a response action, then you could submit the APAR and RACR as a single report.

### **§350.31(g) Institutional Control**

**Q). Does it make any difference, in terms of whether an institutional control is required under TRRP, whether Tier 1, 2, or 3 is used to determine a protective concentration level? For example, suppose an affected property is remediated to attain Remedy Standard A for residential land use. For the purpose of determining whether an institutional control is required at this property, does it make any difference whether Tier 1, 2, or 3 was used to determine the protective concentration levels?**

**A).** No, it doesn't make a difference. The remedy standard and the land use are the two factors typically used to determine whether an institutional control is required. §350.31(g) states that the person attaining Remedy Standard A for commercial/industrial land use or Remedy Standard B for residential or commercial/industrial land use shall provide proof of compliance with the institutional control requirements. Thus, an institutional control is not required under §350.31(g) for Remedy Standard A for residential land use. And, it does not make any difference whether a person uses Tier 1, 2, or 3 to determine protective concentration levels. As long as Remedy Standard A for residential land use is attained, no institutional control under §350.31(g) will be required. There are other sections of the TRRP rule which require an institutional control to be filed in other circumstances for either Remedy Standard A or B. Section 350.31(h) specifies that the TNRCC may require a person to file proof of compliance with institutional control requirements whenever a response action will not be completed or has not been completed within 15 years. Also, §350.51(l) requires a person to file an institutional control whenever an area larger than the standard size for a soil exposure area is used. However, neither of these special cases for use of an institutional control are dependent upon whether Tier 1, 2, or 3 is used to determine the protective concentration levels. Remember though that physical control measures cannot be used to achieve Remedy Standard A and that lateral transport considerations which place the point of exposure for groundwater ingestion outside of the source area cannot be used under Tier 2 or 3 to determine protective concentration levels for Remedy Standard A.

### **§350.32(b)(3) Remedy Standard A**

**Q). Do I have to receive agency approval to implement a Remedy Standard A?**

**A).** In general, no. Submit a Self-Implementation Notice at least 10 days before implementing the response action. However, the response action must be capable of achieving the Remedy Standard A objectives within a reasonable time frame and must be appropriate for the affected property. The agency may require a demonstration of the appropriateness of a remedy or challenge the reasonableness of the stated response action time frame. You are not required to wait on agency approval to proceed with the response action after the 10<sup>th</sup> day, but if it is determined that the self-implemented response action is inappropriate, then the response actions will be required to be amended.

### **§350.33(d) Response Action Plan (RAP)**

**Q). What is the time frame to submit a RAP after an APAR has been submitted and how is that determined?**

**A).** The TRRP rule does not specify a specific time frame within which a RAP must be submitted after an APAR. This type of decision will be made by the particular program areas.

**Q). Can a RAP be submitted before all environmental investigations are complete?**

**A).** Yes, a RAP can be submitted before all environmental information has been collected. We prefer that an APAR contain appropriate information to satisfy the assessment performance requirements for all affected media (e.g., air, soil, groundwater, surface water, and sediment). However, at a minimum, any initial APAR must contain adequate information to support the development and approval of the RAP. Also, in order for the RACR to be approved by the agency, in this circumstance, you must supplement the APAR as necessary so that the assessment requirements of Subchapter C and the informational requirements of §350.91(b) have been fulfilled.

**§350.33(f)(4) Plume Management Zones**

**Q). If a person has secured the approval of downgradient landowners to place institutional controls on their properties, can a plume management zone (PMZ) be used to permit a groundwater PCLE zone to continue migrating for an unlimited distance?**

**A).** No, definitely not. With agency authorization, a PMZ may be used to respond to an existing groundwater PCLE zone in class 2 or 3 groundwater in accordance with §350.33(f)(4). PMZs are not established for class 1 groundwater. To establish a PMZ on on-site or off-site property the person must provide proof of compliance with the institutional control requirements of §350.31(g) within 120 days of the date of approval of the RAP that is required for the PMZ. Specifically, proof of written landowner consent for the filing of an institutional control is required before the TNRCC will approve a response action completion report, unless the person satisfies one of the exceptions specified in the TRRP rule. However, landowner consent for an institutional control is not the only criterion. A PMZ is the current length of the residential groundwater PCLE zone determined at the time of the RAP submittal plus an additional length "X". The additional length "X", or in other words, the amount of plume growth allowed, is dependent upon the groundwater classification and the physical circumstances of the affected property.

§350.37(l)(1), (2), and (3), respectively, specify the requirements for a PMZ in class 2 groundwater in the following circumstances: when the residential groundwater PCLE zone is entirely on-site; when the residential groundwater PCLE zone has migrated onto neighboring property; and to determine whether a residential groundwater-bearing PCLE zone will be allowed to migrate onto off-site property. Under the last of these situations, a person may allow a residential-based groundwater PCLE zone in class 2 groundwater to migrate onto an off-site property which does not currently contain a residential-based groundwater PCLE zone, provided the person can demonstrate that the off-site class 2 groundwater has no reasonably anticipated future beneficial use. However, to allow such migration onto an off-site property the person must also secure written concurrence for an institutional control from that landowner unless the property is subject to zoning or governmental ordinance which is equivalent to the institutional control that would otherwise be required. The maximum additional length "X" of a PMZ in a class 2 groundwater-bearing unit is determined as the smallest of the applicable distances described in §350.37(l)(4). For a PMZ in a class 2 groundwater-bearing unit, the additional length for a PMZ varies between 0 and 500 feet, depending upon the circumstances at a particular affected property.

The additional length "X" incorporated into a PMZ within a class 3 groundwater-bearing unit is determined by establishing the downgradient boundary of the PMZ. Unlike the 500 foot maximum additional distance established for "X" in class 2 groundwater, there is no maximum additional distance for PCLE zone growth in class 3 groundwater. The smallest of the following distances, measured from the current downgradient boundary of the residential-based class 3 groundwater PCLE zone, defines the maximum allowable expansion for the downgradient PMZ boundary:

- ! to within two years groundwater time upgradient of:
  - the closest hydraulically downgradient off-site property for which the landowner has not provided written concurrence to allow the recording of an institutional control for situations where zoning or a governmental ordinance does not serve as the institutional control;
  - the downgradient limit of a zoning or governmental ordinance that serves as the institutional control; or
- ! the distance to a surface water point of exposure.

The TNRCC regulatory guidance document titled *Human Health Points of Exposure* (RG-366/TRRP-21) provides further details regarding PMZs.

**Q). Can attenuation monitoring points be set at a fixed level without the need for a fate and transport model if the groundwater PCLE zone is stable for Class 2 or 3 groundwater in a PMZ? Am I right in that Class 1 groundwater attenuation points need to be calculated in the traditional sense with a fate and transport model to show that the groundwater PCL will be reached in a reasonable amount of time?**

**A).** Attenuation action levels can be set in two ways.

1. Fate and transport modeling of lateral transport when PCLE is expanding or if unable to verify stable/declining plume.
2. From analysis of actual monitoring data when the PCLE zone is documented to be steady state or declining.

Attenuation monitoring points/attenuation action levels are terms that are only associated with plume management zones. Plume management zones can only be established for already affected Class 2 and 3 groundwaters. Therefore, in response to your last comment, this discussion is typically irrelevant to Class 1 groundwaters as you can not establish a plume management zone for Class 1 groundwaters except in the one situation when restoration of the Class 1 groundwater is determined to be technical impracticable. Monitored natural attenuation can be used for remediation of Class 1 groundwater, but in that context the terms attenuation monitoring point/attenuation action levels are not used.

**Q). The rule states that attenuation monitoring points must be calculated for each chemical of concern at each attenuation monitoring point [30 TAC 350.33(f)(4)(D)(ii)]. If PCLE zone stability is the goal is it really necessary to calculate future attenuation values. Isn't it enough to show that there is a decrease without actually having to quantify the future predicted decrease?**

**A).** Attenuation action levels and attenuation monitoring points are an integral part of establishing a plume management zone (PMZ) [§350.33(f)(4)(D)]. The rule does require that attenuation action levels be calculated for each attenuation monitoring point. The attenuation action levels serve as sentinels in the event a chemical of concern in the PMZ begins to migrate such that the critical groundwater PCL would not be met at the point of exposure.

To clarify, in case there is any misunderstanding, attenuation action levels are not a rate of decrease in concentration over time, or a predicted series of declining concentrations in an attenuation monitoring point over time. Rather they are the maximum concentration that can be present in an attenuation monitoring point and not result in the critical groundwater PCL being exceeded at the POE. So in that regard, there is not a "future" element to it. However, there is some future element if by future you are saying as long as the COC concentration out at downgradient attenuation monitoring point X does not increase to above concentration Y, then the POE is protected.

The rule is probably too specific in use of the term "calculated". The issue that was focused on was PCLE zone expansion. Generally, "calculation" was intended to mean a back-calculation from the POE to the source area using fate and transport modeling of lateral groundwater transport of the COC to arrive at the attenuation action levels. However, in the event the conclusion is definite that the PCLE zone is stable or declining, then an adequate time-series COC concentration data set must have been evaluated in order to arrive at that conclusion. Given this, the statistical evaluation of a time-series data set collected from an attenuation monitoring point and ultimately arriving at an attenuation action level for that attenuation monitoring point is a calculation. Therefore, calculation does not absolutely have to involve back-calculation or modeling of lateral groundwater transport of COCs.

Fundamentally, it is true that if the PCLE zone is truly stable, then fate and transport calculation may not be warranted. In that instance, the current groundwater concentration at each attenuation monitoring point could be set as the attenuation action level. As long as that concentration is not exceeded in the respective attenuation monitoring point, the critical PCL should not be exceeded at the POE (presuming the critical PCL is not already exceeded at the POE).

However, the specificity in the rule at §350.33(f)(4)(D)(ii) precludes the exact endpoint that may be desired (i.e., not having to set attenuation action levels). The question is posed in the context of a stable plume. It was not

mentioned if the PMZ is or could be allowed to be bigger than the PCLE zone. If the PMZ is bigger, then the back-calculation from the POE into the source area would yield higher attenuation actions levels and provide the person more of a "cushion" than just measuring the concentrations in the attenuation monitoring points. By "cushion," we mean that the difference between the concentrations in the attenuation monitoring point and the attenuation action level. A "cushion" may provide relief from §350.33(f)(4)(D)(iii) when there are frequent oscillations in the groundwater concentrations, but there is no net PCLE zone expansion. When the attenuation action level is set to be the concentration in the attenuation monitoring point, there is no room to accommodate the oscillations.

### **§350.33(f)(4)(D)(ii) Attenuation action levels**

#### **Q). How are the attenuation action levels calculated?**

**A).** In general, the critical PCL is established for the groundwater POE. Through a contaminant fate and transport evaluation (e.g., lateral transport and decay considerations), the attenuation action level to be met back at the groundwater source area is determined. Once the attenuation action level is established for the groundwater source area, the same fate and transport model can then be used to predict the concentration at an attenuation monitoring point at distance x from the groundwater source area, starting with the attenuation action level concentration to be met at the groundwater source area. Please note that such lateral transport evaluations are at least a Tier 2 PCL level of evaluation. The Tier 2 PCL equations can be downloaded at:

<http://www.tnrc.state.tx.us/permitting/trrp.htm>.

### **§350.33(f)(4) PMZs, POEs, and groundwater classification**

**Q). A PCLE zone in a small class 2 groundwater-bearing unit is discharging completely to a lake. The site qualifies for a PMZ. The surface water standard when adjusted for dilution is greater than <sup>GW</sup>GW<sub>ing</sub>. What is the PCL for surface water and groundwater and where is the POE?**

**A).** The groundwater to surface water POE is discussed in §350.37(i) and is set in the groundwater at the groundwater-surface water discharge area.

Where is the groundwater ingestion POE? The major aspect of a PMZ is that the POE to groundwater changes from throughout the groundwater PCLE zone to an alternate location either within, at, or beyond the hydraulically downgradient limit of the PCLE zone established in accordance with §350.37(l) or (m) or §350.77 for ecological receptors at the time of RAP submittal. For class 2 groundwater, the "x" distance defining the acceptable plume growth is defined to be the least of a number of criteria, one of which is the distance to the surface water POE. Since the groundwater PCLE zone is already discharging completely into the surface water body, the value for "x" at this site would be zero. No further growth would be allowed. According to the rule, the POE for groundwater discharge to surface water will be at the point of groundwater discharge (i.e., within the groundwater) into any surface water body. The surface water PCL is the surface water RBEL for that lake, possibly adjusted for dilution if the surface water RBEL is exceeded. The groundwater PCL at the groundwater-surface water POE is <sup>SW</sup>GW. In this case there would be no groundwater ingestion POE to the PMZ at the downgradient extent. However, groundwater POEs would be established along the lateral margins of the PMZ. <sup>GW</sup>GW<sub>ing</sub> or other relevant PCL would apply at these POEs. Another POE could be required for sediment [§350.37(k)].

**Q). An analogous situation is where class 2 groundwater transitions to or discharges to class 3 groundwater, and the limits of the class 2 PMZ overlaps class 3 groundwater.**

**A).** The alternate POE concentration and location for the PMZ would be based on the class 3 requirements of §350.37(m), but the class 2 requirements for no increased concentrations in the groundwater in the source area would apply pursuant to §350.33(a)(2).

A PMZ which overlaps two different groundwater classes doesn't change the classification and response objectives of the underlying groundwater. Therefore, in this example, the alternate POE placed in class 3 groundwater at the downgradient end of a PMZ doesn't make the whole PMZ equivalent to class 3 groundwater.

### §350.33(f)(4) PMZs, PCLs, POEs

**Q). The smallest of the distances for location of the POE for a PMZ at an affected property would be to a surface water body (350.37(l)(4)(E). Is the critical PCL for this situation the groundwater-to-surface water (<sup>SW</sup>GW) PCL described in 350.75(i)(4) or do you also have to consider groundwater ingestion immediately before the groundwater discharges into the surface water?**

**The fact that the POE is determined by the presence of a surface water body seems to indicate that the intent is for the PCL to be based on exposure to surface water and not groundwater prior to discharge into the surface water. Is this correct?**

**A).** For a PMZ, one important factor is consideration of the impacts to surface water (350.33(f)(4)(A)(ii)). In answering the question then, there is an implied "Assuming a PMZ is approved..."

There are four scenarios to discuss.

1. The groundwater PCLE zone is already totally discharging to the surface water body. If the groundwater PCLE zone is totally discharging to the surface water body, then the <sup>SW</sup>GW PCL is what applies at a required groundwater-to-surface water POE.

2. The groundwater PCLE zone has not yet reached the surface water discharge point but there is groundwater-surface water interconnection, and the distance to surface water is the distance-limiting factor for setting an alternate POE. In this instance, then the POE will be at the surface water discharge point and the <sup>SW</sup>GW PCL is what will apply.

3. The groundwater PCLE is already discharging to the surface water and also flows past the surface water body. In this instance, there will possibly be two POEs, one at the groundwater-to-surface water discharge zone where <sup>SW</sup>GW PCL applies and a second in the groundwater beyond the surface water to address the groundwater PCLE zone which extends beyond the surface water where <sup>GW</sup>GW<sub>ing</sub> or other groundwater PCL would apply.

4. The groundwater PCLE flows beneath a surface water body, but does not discharge COCs to the surface water body. No POE will be set for the surface water and the distance to a surface water body is irrelevant.

In all four scenarios, additional POEs apply at the lateral margins of the PMZ which could be based on <sup>GW</sup>GW<sub>ing</sub> or other PCL as applicable.

### §350.33(f)(4) PMZs and POEs

**Q). Under the alternate POE scenario for class 3 groundwater, may an approved PMZ continue to grow laterally until an institutional control boundary or surface water POE is encountered? Since critical groundwater PCLs are based on POEs that can be located very far away, is the only corrective action that may be required the possible monitoring for (residential) inhalation concerns?**

**A).** The answer to these questions depend on site-specific determinations.

The initial question which should be asked is whether a PMZ should be authorized for the class 3 groundwater. A person does not have an affirmative right to establish alternate POEs to class 2 or 3 groundwater. Establishment of a PMZ requires the agency's approval. The groundwater classification system is used to determine general eligibility; however, site-specific appropriateness must also be demonstrated. In this regard, §350.33(f)(4)(A) itemizes potentially adverse effects on groundwater and surface water quality which must be considered.

The TRRP rule specifies in §350.37(m) that, provided a PMZ has been authorized in response to §350.33(f)(4), a person may establish an alternate on-site or off-site POE to class 3 groundwater. Unlike class 2 groundwater, the PCL for class 3 groundwater is not based upon groundwater ingestion. Instead the PCL to be applied at the alternate POE to class 3 groundwater is <sup>GW</sup>GW<sub>Class 3</sub> which is 100 times greater than the residential-based <sup>GW</sup>GW<sub>ing</sub>. Upon approval of the PMZ, there is no POE to groundwater throughout the groundwater PCLE zone. Instead, the groundwater POE is located at the downgradient limit of the PMZ.

Unlike the 500-foot maximum additional distance established for alternate POEs in class 2 groundwater, there is no maximum additional distance specified for alternate POEs to class 3 groundwater. The smallest of the following distances, measured from the current downgradient boundary of the residential-based class 3 groundwater PCLE zone, defines the maximum allowable expansion for the downgradient PMZ boundary:

- C to within two years groundwater travel time upgradient of:
  - the closest hydraulically downgradient off-site property for which the landowner has not provided written concurrence to allow the recording of an institutional control for situations where zoning or a governmental ordinance does not serve as the institutional control; or
  - the downgradient limit of a zoning or governmental ordinance that serve as the institutional control; or
- C the distance to a surface water POE.

To qualify as a “zoning or governmental ordinance that serves as the institutional control” such zoning or governmental ordinance must be equivalent to the deed notice, Voluntary Cleanup Program certificate of completion, or restrictive covenant that otherwise would be required. The agency stated in the preamble to the final TRRP rule that it will accept zoning and governmental ordinances when they are determined to have equivalency to the institutional controls that otherwise would be required. Criteria to demonstrate equivalency could include, but need not be necessarily limited to:

- C the zoning or ordinance is by its terms sufficient to provide the control that is required to be protective of human health and the environment;
- C the zoning or ordinance provides notice of the COCs left in place and that the zoning or ordinance is necessary to prevent exposure to the COCs;
- C the zoning or ordinance applies to both current and future uses for the land covered; and
- C the zoning or ordinance cannot be modified or rescinded without the consent of the TNRCC.

In the situation where the zoning or governmental ordinance is determined to be equivalent to a deed notice, Voluntary Cleanup Program certificate of completion, or restrictive covenant, the maximum allowable expansion of the PMZ boundary is based on the smaller of:

- C the distance to two years groundwater travel time upgradient of the downgradient limit of a zoning or governmental ordinance that serves as the institutional control; and
- C the distance to a surface water POE.

In the case of equivalent zoning or governmental ordinance, the person does not need to receive the written concurrence of an off-site landowner for the recording of an institutional control prior to allowing a PMZ to extend onto an off-site property. No site-specific institutional control will be required in this case as the equivalent zoning or governmental ordinance is the institutional control that will be relied upon to protect human health and the environment. If the affected property in question meets the qualifying criteria, then, YES, it could be a substantial distance to the downgradient boundary of the zoning or governmental ordinance.

In the situation where the zoning or governmental ordinance is determined to not be equivalent to a deed notice, Voluntary Cleanup Program certificate of completion, or restrictive covenant, the maximum allowable expansion of the PMZ is based on the smaller of:

- C the distance to two years groundwater travel time upgradient of the closest hydraulically downgradient off-site property for which the landowner has not provided written concurrence to allow the recording of an institutional control for situations where zoning or a governmental ordinance does not serve as the institutional control; and
- C the distance to a surface water POE.

In this case, a deed notice, Voluntary Cleanup Program certificate of completion, or restrictive covenant will be required for all affected properties. The person may not allow a PMZ to extend onto an off-site property unless he has received written concurrence from that off-site land owner for the recording of an institutional control. If a person does secure written concurrence from an off-site landowner for the recording of an institutional control, then he may allow a PMZ to extend onto that off-site property. However, NO, the person may not allow expansion of the PMZ to the downgradient limit of zoning or a governmental ordinance since neither serves as the institutional control.

The answer to the second question regarding monitoring for inhalation concerns also depends upon site-specific circumstances. In general, the answer is NO, that a response action for a PMZ in class 3 groundwater could not be limited to monitoring for inhalation concerns. Monitoring for inhalation concerns may be commonly conducted, however, a PMZ in class 3 groundwater with an alternate POE at a distant boundary of an equivalent zoning or institutional control must also attain the performance requirements for PMZs. A person establishing a PMZ in either class 2 or 3 groundwater must comply with the performance requirements for PMZs specified in §350.33(f)(4)(C)-(F). These performance requirements are briefly summarized as:

- C §350.33(f)(4)(C) - Specifies initial criteria for the establishment of a PMZ including a demonstration that there are no artificial penetrations which can allow COCs which exceed the critical groundwater PCLs to migrate from the groundwater PCLE zone to currently unaffected groundwater-bearing units;
- C §350.33(f)(4)(D) - Specifies establishment of attenuation monitoring points, attenuation action levels, and monitoring schedule to demonstrate critical groundwater PCLs are not exceeded at POE. If a critical groundwater PCL is exceeded at POE, then an active response action is required;
- C §350.33(f)(4)(E) - Requires the person to reduce non-aqueous phase liquids which contain COCs in excess of PCLs within a PMZ to the extent practicable as defined in that section; and
- C §350.33(f)(4)(F) - Places a continuing obligation on the person to assess whether changes to local hydraulic gradient will increase the likelihood that COCs will migrate beyond the PMZ at concentrations above the critical groundwater PCLs. If necessary, the person shall take any additional necessary corrective action.

### **§350.34(2) Conditional no further action**

**Q). If my site meets Remedy Standard A Tier 1 levels on-site and no further action (NFA) is needed, but off-site property still needs a response action, then can a "conditional no further action" letter be issued for the on-site property so the on-site property can be sold and address the off-site property separately?**

**A).** No. A conditional NFA letter can only be issued under Remedy Standard B. However, §350.34 also states that program areas may issue other letters (non-§350.34 letters) acknowledging conditional or partial completion of response actions, as appropriate. If the reason the off-site property does not meet NFA criteria is because of on-going influence of off-site concentrations by the on-site property, then it would not be appropriate to issue the conditional NFA letter for the on-site property. If the program chose to issue a conditional no further action letter, it would need to be conditioned on the completion of the off-site affected property. Also, since the buyer may be a potential RP for the off-site matter, the letter may disclose that there is still a current and future Responsible Party issue here that one can't sell away. Once the response action is complete to Remedy Standard A requirements, on-site and off-site, then the NFA will reference §350.34(1) and we may include something like "this letter confirms that no further action is required unless the conditions of §350.35 "substantial change in circumstances" become applicable.

### **§350.35(e) Substantial change in circumstances**

**Q). Does §350.35(e) only apply to 30 TAC Chapter 334 Underground and Aboveground Storage Tank sites (PST program)?**

**A).** No. Section 350.53(e) applies to all affected properties addressed under TRRP. To the extent §350.35(e) applies to PST, it applies only to those leaking PST cases that were addressed under TRRP. If a leaking PST case was addressed under 30 TAC 334, Subchapter D, and not TRRP, then §350.35(e) does not apply to it.

## §350.36 Soil Reuse

### Q). When does §350.36 have to be complied with?

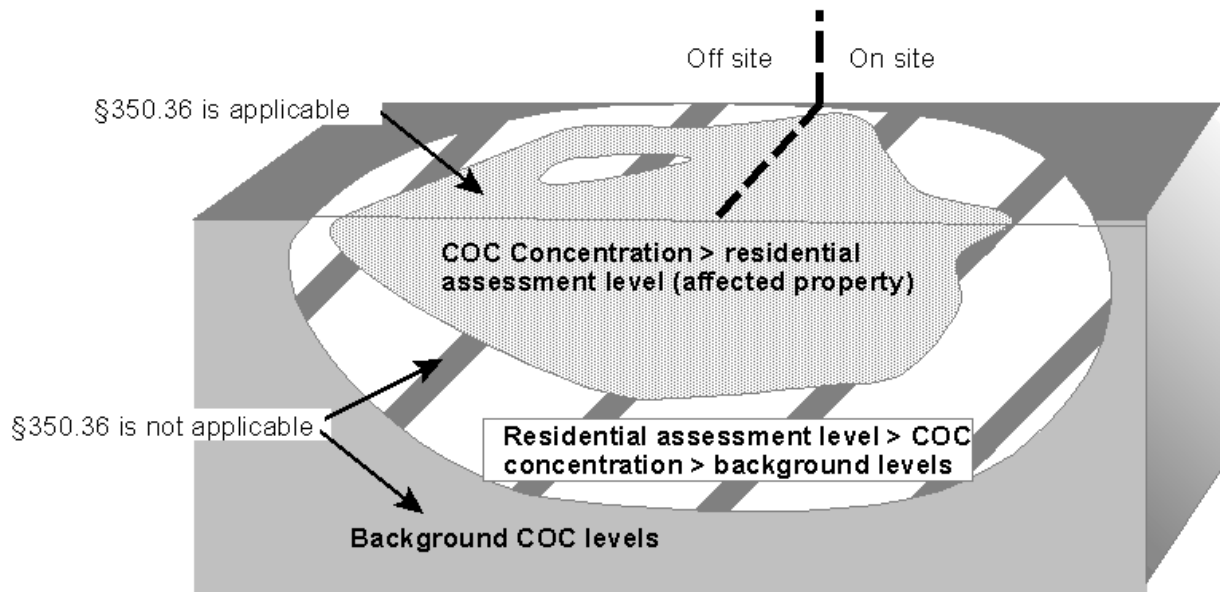
**A).** Section §350.36 must be complied with, anytime soils with COC concentrations in excess of naturally occurring background levels are removed from **within an affected property** where a TRRP response action is being or was applied, and those removed soils are to be relocated for reuse purposes. Remember, an affected property is the area where COC concentrations were equal to or greater than residential assessment levels. This includes both the on-site and off-site portions of the affected property. Therefore, §350.36 is not applicable to the:

- reuse of soils containing COCs derived from an area never addressed under TRRP;
- reuse of soils containing COCs that were beyond the limits of the defined affected property, for example, a portion of the same real estate, but that is not included within the affected property limit.

Please note that the PCLs and remedy standard must be appropriate for the reuse location. Also, “response action” includes assessment and not just removal, decontamination, or control.

To illustrate the point, in the block diagram on the next page, a release of a COC has occurred to soil. Following the completion of the assessment, three zones can be identified: the affected property (COC concentration > residential assessment level), a zone affected with COCs at concentrations that exceed background, but less than the residential assessment level (residential assessment level > COC concentration > background), and the remainder of the soil with concentrations of the COC at background concentrations. TRRP response actions are only applied to the affected property. Therefore, §350.36 applies only to soils within the affected property (COC concentrations > residential assessment level) that are re-used. Further, §350.36 is applicable to the original extent of affected property until at some point in time when the COC concentrations within the original affected property footprint no longer exceed the background levels. In other words, §350.36 is always applicable to the soils within the affected property boundary as long as the COC concentrations exceed background.

If the resolution of assessment data is sufficient enough to distinguish more than one affected property horizontally or vertically (e.g., two affected properties separated horizontally or vertically by soils with COC concentrations less than the residential assessment level), then §350.36 would only apply to the two affected properties, and not the intervening thickness of soil that contains COC concentrations less than the residential assessment level. As illustrated in the diagram, there may be areas within the boundary of the affected property that may have COC concentrations less than residential assessment levels, creating a donut hole effect. In that case, the donut hole is technically not part of the affected property and therefore §350.36 would not apply to that donut hole portion.



**Q). Under §350.36(b)(2), how is the determination that the reuse would be protective for ecological receptors?**

**A).** It is recommended that the person wanting to reuse the soils evaluate the location where the soils are to be reused with the Tier 1 Exclusion Criteria Checklist as set forth in §350.77(b). The checklist should be completed as if the soils had already been relocated. If the checklist is passed, then ecological receptors are protected. If the checklist is failed, then further evaluation should be pursued to evaluate potential ecological risk and set ecological PCLs as warranted in accordance with §350.77(c) and (d).

**Q). Subsection §350.36(e) requires the completion of the applicable portions of the Response Action Completion Report (RACR) when soils are relocated for reuse purposes. What are the applicable portions of the RACR?**

**A).** The applicable portions of the RACR are §350.95(a), (b) or (c) depending on whether complying with Remedy Standard A or B, respectively; and (d)-(f).

**Q). A person wants to remove soil that contains COCs in excess of the health-based level and take the soils to another property they own. The soils would not be treated, so those cannot meet the TRRP soil reuse provisions in §350.36. §335.2(d) states that a permit is not needed for disposal of waste on the person's property. Is there any other authorization needed?**

**A).** There are three options for handling contaminated soil removed from an affected property.

- 1) Dispose of the soil in an authorized manner, such as in a permitted landfill.
- 2) Reuse the soil under the provisions of §350.36.
- 3) Obtain TNRCC authorization to place the soil on property owned by the person. 30 TAC §335.2(d) exempts a person from having to get a non-RCRA permit for "on-site" waste disposal. "On-site" property here can include land located within 50 miles owned by the same person. Historically, non-RCRA permits have only been issued for commercial disposal sites where waste is brought in from elsewhere, "off-site", for disposal. 30 TAC §335.2(d) does not exempt the person from the rest of Chapter 335. The large universe of "on-site" disposers is regulated by the solid waste registration and all of the rest of Chapter 335. If the person does not use §350.36 as the basis for soil relocation, the solid waste must be classified as Class 1, 2 or 3 and managed accordingly, unless exempted from the definition of solid waste by §335.1(124). Prior to moving the soils, the person would have to set up a solid waste registration for that other property where the soils are to be relocated and deed record per §335.5 if disposing of the soil as a waste in a landfill. Having thus entered the regulatory realm, the landfill at the other property must be closed, which, via §335.8 obligation to close, brings the person back to TRRP. The person would then be responsible for corrective action at two sites rather than just one.

In the question, the point was raised that the person will not be treating the soils, therefore §350.36 will not be met. Section §350.36 only requires treatment if PCLs applicable for the reuse location are exceeded and the person intends to complete the soil reuse in compliance with Remedy Standard A. Alternatively, the soils could be reused in conjunction with institutional and physical controls in compliance with Remedy Standard B. Affected soils do not necessarily have to be treated to comply with §350.36. Section §350.36 is only applicable for the soils within an affected property addressed under TRRP which contain COCs in excess of naturally occurring background levels.

## **§350.37(a) Institutional controls**

**Q). In order to classify off-site property as commercial/industrial, does the property owner have to deed restrict their property?**

**A).** Yes. In order to establish on-site or off-site POEs for commercial/industrial land use, or alternate POEs for on-site or off-site properties, you must comply with §350.111 (relating to Use of Institutional Controls). The owners of the land surrounding the on-site property do not need to place an institutional control on their property just to keep on using it. However, in order for you to use a commercial/industrial land use assumption to be used for off-site properties so as to determine commercial/industrial, rather than residential, PCLs for off-site properties, then the owners of those properties must be willing to place an institutional control in their property deed records. If the landowner refuses to grant consent for the filing of an institutional control, then residential-based PCLs will be required for that off-site land unless the provisions of §350.111(d) are satisfied.

The same conditions apply for on-site properties where the person taking the action under TRRP does not own that on-site property.

## Subchapter C Affected Property Assessment

### §350.51(i) Receptor surveys

**Q). If groundwater is not affected, is a field survey and/or records survey required to classify the groundwater?**

**A).** Groundwater cannot be classified as Class 2 or Class 3 without conducting the field survey and records survey required in §350.51(i). If groundwater is not affected above the residential assessment level and the person assumes a Class 1 groundwater resource, then the one-half mile records survey is not required. The 500-foot field survey is always required. Conduct the 500-foot field survey to locate potential receptors to at least 500 feet beyond the boundary of the affected property, and conduct the records survey to identify all water wells and surface water bodies within one-half mile of the affected groundwater.

### §350.51(m) Texas-Specific Median Background Concentrations

**Q). What is the basis for the Texas-specific background data in TRRP?**

**A).** The United States Geological Survey issued a study of background metal levels in U.S. soils in the early 1980s. One hundred twenty samples from different areas across Texas were included in the study. We went through and picked the median for each metal for use in TRRP.

It is important to note that this background data was NOT intended to be a full characterization of what local background concentrations at a particular site might be. Obviously, with only 120 samples, large parts of the State weren't included in the USGS evaluation. If you think these values underrepresent local background, collect site-specific samples.

These median values just give us a general feel for "typical" background values in the state, and really just reflect a "policy" background decision by the agency. Their usefulness is that they may save you the time/trouble/costs of having to determine background on a site-specific basis.

The reference is:

Boerngen, J.G. and Shacklette, H.T., Chemical Analyses of Soils and other Surficial Materials of the Conterminous United States, United States Geological Survey, Open File Report 81-197, 1981.

**Q). Can I use the Texas specific median background concentrations from the TRRP rule to determine the extent of contamination and set cleanup levels under the Risk Reduction rule (Chapter 335)?**

**A).** No. You must determine background on a site-specific basis when conducting the actions under the Risk Reduction rule (Chapter 335), unless to do so is logistically infeasible. See the Interoffice Memorandum dated June 28, 2000 regarding "Using non-site specific background assumptions under the 30 TAC 335 Risk Reduction Rules" that can be downloaded from the Risk Reduction rule web page at <http://www.tnrcc.state.tx.us/permitting/rrr.htm>.

**Q). If I use a Texas-specific median background concentration for one metal at my affected property, do I have to use a Texas-specific median background concentration for all of them? How do I determine background for metals that are not on this list?**

**A).** Use of the §350.51(m) background values, none, part or all, is completely up to the discretion of the person. It was never intended to be an all or nothing system.

If a metal is not on the list, then background has to be set site-specifically, if the person chooses to or needs to address background. For lack of a site-specifically determined background value, then we would have no choice but to presume the concentration is zero. For organics, background is defined by the method quantitation limit of the most sensitive standard available method.

## **§350.52 Groundwater resource classification**

**Q). The concentrations of COCs detected in groundwater samples from a property are all less than the applicable Tier 1 residential groundwater PCLs. Based on the groundwater analytical results, is my property exempt from use of the TRRP groundwater resource classification system? If the property is exempt from the groundwater resource classification system, then it appears that there are no applicable soil-to-groundwater (<sup>GW</sup>Soil) PCLs for the property. If this is the case, what are the applicable <sup>GW</sup>Soil PCLs and how are they determined?**

**A).** During an assessment, it is always necessary to classify the groundwater-bearing unit(s) at the affected property. In lieu of a site-specific groundwater class determination, the groundwater class defaults to Class 1. The Tier 1 residential groundwater PCL you select to compare against the actual groundwater concentrations is dependent upon the groundwater classification. A residential PCL for groundwater Classes 1 and 2 will be different than that for Class 3.

Similarly, the calculation of a soil-to-groundwater PCL is groundwater class-specific, and is necessary when COCs are present in soil and it cannot be shown in accordance with §350.75(i)(7)(C) that the soil concentrations are too low to cause impact to unaffected groundwater-bearing units.

Conceptually, there is no "exemption from the groundwater classification system." The uppermost groundwater-bearing units are classified to allow associated soil PCLs to be determined. COCs in soil must be shown to be protective of the groundwater-bearing units. The soils must be protective such that any leachate does not cause an unaffected groundwater to be affected above the groundwater PCL.

**Q). An impacted site on the Austin Chalk formation has impacted several wells and threatens many more. The saturated interval is primarily a thin section of weathered chalk, which changes in thickness with structural features. The residential irrigation wells generally do not produce water during the summer months in dry years, but are used on vegetable gardens when they are productive.**

**Would this groundwater zone be considered a Class 2 groundwater regardless of the yield because of the irrigation wells or would it be a Class 3 groundwater because of the lack of sustainable yield?**

**Also, if the irrigation wells were not there, but we were still dealing with large variations in yield between different monitor wells (some >150 gallons per day, some <150 gallons per day), would the zone be Class 2 or Class 3?**

**A).** First we must know whether the saturated interval of the Austin Chalk meets the definition of a groundwater-bearing unit as presented at §350.4(a)(40). In other words, is the hydraulic conductivity of this zone equal to or greater than  $1 \times 10^{-5}$  centimeters/second? These are important questions because a saturated interval must initially be a groundwater-bearing unit before it can be a Class 1, 2, or 3 groundwater resource. If the saturated interval is not a groundwater-bearing unit, then it would, depending upon depth, be either a surface or subsurface soil. However, even if the saturated interval is determined to not be a groundwater-bearing unit, if the wells are threatened or impacted, then §350.31(a) which requires protection of human health and §350.75(b) can be exercised in conjunction to compel action as needed to mitigate the impact, even if that includes approaching the saturated interval as groundwater.

Next, suppose 1) that the saturated interval is a groundwater-bearing unit, 2) that it is a production zone for an existing non-public water supply well located within 1/2 mile of the affected property and 3) that the well is used to supply

groundwater for human consumption or agricultural purposes, then the saturated interval would, as defined in §350.52(2)(A), be a Class 2 groundwater resource. You will note that there is no requirement expressed here either that the groundwater unit must be affected or that the unit must have a sustainable yield in order to be a Class 2 groundwater resource. The existence of the wells, the fact that the saturated interval is a production zone for the wells, and agricultural or human consumption use of the produced groundwater is all that is required for classification as a Class 2 groundwater resource. Thus, a straight-forward interpretation of the rule would mean that the shallow saturated interval of the Austin Chalk would be Class 2 groundwater. If you could possibly make written arrangements with all necessary property owners so that all wells producing from the shallow zone within 1/2 mile of the affected property are plugged prior to the completion of the response action, the classification of the groundwater-bearing unit would change to a Class 3 rather than Class 2 groundwater resource. The fact that wells are affected meets the §350.52(2)(A) criteria that a groundwater production zone for an existing well has been affected. It is Class 2 groundwater.

If the water supply wells were not there, then we could look at some type of averaging of the well yield across monitoring wells, in the context of hydrogeologic considerations. You would determine whether the variance is due to primarily well construction limitations or actually due to groundwater-bearing unit characteristics. From the description, it sounds like groundwater-bearing unit limitations, so it would be class 3. §350.52 states that if the classification is on the border between two classes, then it is the higher of the two, "unless otherwise approved by the executive director."

**Q). A Class 2 groundwater resource includes: Any groundwater bearing unit which is a groundwater production zone for an existing well located within 1/2 mile of the affected property and which is used to supply groundwater for human consumption, agricultural purposes or any purpose which could result in exposure to human or ecological receptors."**

**What if the wells can be capped? Do dug wells count? What happens if a dug well has no identifiable purpose? For example, a dug well was used by an old homesteader that is no longer on the property. The well once supplied the homestead but since it is no longer there the dug well serves no purpose.**

**A).** The use status and method of well installation are not relevant for groundwater classification. However, the groundwater production zone of such well is relevant. A shallow hand dug well may have a particularly limited groundwater production zone. It should be pointed out that the described abandoned well scenario is in violation of the Water Well Driller's Regulations if it truly is unused and abandoned. The groundwater classification system factors in "existing" wells. The term existing should be viewed to mean at the time of the response action completion. Therefore, a response action could include the proper plugging of such well, the action that may be required to comply with the Water Well Driller's Regulations. Once the well is plugged, then the receptor is eliminated and the classification of the groundwater could be re-evaluated. The other extreme could also occur. A groundwater would need to be re-classified if a new well is installed prior to the completion of a response action such that the classification would be more sensitive.

**Q). Can the determination of a groundwater-bearing unit classification be made on a regional scale?**

**A).** The TRRP groundwater resource classification system is a site-specific classification of a groundwater-bearing unit at a particular affected property. It is not intended to classify groundwater within a geologic formation, over a regional area.

**Q). A Class 2 groundwater resource includes: Any groundwater bearing unit which is capable of producing waters with naturally occurring TDS content less than 10,000 mg/L and at a sustainable rate greater than 150 gallons per day to a well with a four inch diameter casing or an equivalent sustainable rate in gallons per day to a well with a smaller or larger diameter casing."**

**In the definition of Class 2 groundwater, what does sustainable rate mean? Does that mean 150 gallons a day everyday or a total of 150 gallons x 365 =54,750 gallons sometime during the year?**

**A).** Further guidance is being developed to further clarify the question of sustainability as it relates to groundwater-bearing units (see TNRCC guidance document *Groundwater Classification* (RG-366/TRRP-8)). As a practical matter, the TNRCC will evaluate "sustainable rate" to determine if the subject groundwater-bearing unit can produce the specified rate on a daily basis, throughout the calendar year. Groundwater-bearing units which cannot yield the "sustainable rate" throughout the year (e.g., during summer months) will not meet the criteria. Of course, such evaluations must also look at climatic factors, well design, and the general hydrogeology of the area. Future guidance on this topic will likely provide clarification on groundwater classification in complex hydrogeologic environments.

The operative point is that it is throughout the year. It is likely that small perched or discontinuous zones may not meet this criteria. However, unless it is likely that there is high variability in saturated volumes throughout the year, then this sustainability demonstration may be a difficult one to disprove. It would be worthwhile to consider the hydrogeologic context before such an endeavor is undertaken unless history has already shown that the groundwater is not reliably present.

**Q). How does the TRRP groundwater resource classification take into account the scenario in which groundwater containing COCs discharges into surface water near or at the vicinity of the intake valves of a surface water public drinking water supply?**

**A).** The groundwater classification does not influence the response action for the scenario described, namely, that of groundwater with COCs migrating to a surface water public drinking water supply. The development of the surface water risk-based exposure limit (RBEL) and protective concentration level (PCL) are the portions of the TRRP rule that would control this situation. Basically, it is the quality and designated use of the receiving surface water body that determines what the RBEL or PCL will be. This value is then measured in the groundwater, not the surface water. So even if the groundwater is classified as class 3, the measure of compliance with the surface water RBEL is taken in a well completed in the class 3 zone, immediately upgradient of the zone of discharge to the surface water.

For example, COC "X" has an MCL set at 0.005 mg/L. In a class 3 groundwater, the groundwater PCL can be 100 times greater, or 0.5 mg/L. Suppose the controlling value for the COC in surface water is 0.002 mg/L (if dilution is not considered). You would have to meet 0.002 mg/L in groundwater as measured in a well as close as practical to the point of exposure which is the area of groundwater-to-surface water discharge. So it doesn't matter if there is an impact to surface water for purposes of groundwater classification. The critical rule citations are:

§350.37(i) - defines the groundwater-surface water POE

§350.51(f), (i), (k) - actions specific to surface water to be performed as part of the affected property assessment;

§350.71(c)(7) - exposure pathway analysis; determine if the groundwater-surface water pathway is complete or reasonably anticipated to be complete;

§350.74(h)(1-7) - how to calculate the surface water RBEL

§350.75(i)(4)(A-F) - how to calculate the <sup>SW</sup>GW PCL, including whether dilution of groundwater flow by the surface water flow can be used. Recall that <sup>SW</sup>GW PCL = RBEL/dilution factor. If COCs in groundwater are at or below the RBEL, dilution cannot be used, dilution factor = 1, hence PCL = RBEL. This is also the provision that requires performance to be measured in the groundwater.

§350.77 - Ecological risk assessment. COCs reaching surface water is an automatic trigger for Tier 2 or 3 of the ERA process. It is possible that an eco-based PCL could be the critical PCL for this scenario.

**Q). Does the groundwater classification system take into account the current land use of the property? And if so, would the agency consider any further action if the type of land use changed, say from industrial to residential, due to suburban expansion or urban renewal?**

**A).** Classification of a groundwater-bearing unit as a class 1, 2, or 3 groundwater resource is not dependent upon the current land use of an affected property. The groundwater resource classification does not depend upon whether the land use is classified as residential or commercial/industrial. For example, if a groundwater-bearing unit meets one of the qualifying criteria for a class 1 groundwater resource, then this unit will be classified as class 1 groundwater regardless of whether the land use is residential or commercial/industrial.

The PCLs for any COCs in groundwater are, however, dependent upon the land use. For example, the Tier 1 PCLs for acenaphthene based on groundwater ingestion are 1.5 mg/l for residential land use and 4.4 mg/l for commercial/industrial land use. This means that the size and location of the groundwater PCLE zone are also dependent upon land use. Since the risk-based groundwater PCL for residential land use is typically a lower concentration than the groundwater PCL for commercial/industrial land use, the residential groundwater PCLE zone is generally larger than the commercial/industrial groundwater PCLE zone. If a COC has a promulgated maximum contaminant level (MCL), then that level is used for both land uses.

Likewise, a change in land use from commercial/industrial to residential would be a “substantial change in circumstance” and the response action including revised PCLs would have to be protective for that revised land use, but the land use changes in and of itself would not change the groundwater classification.

**Q). I have a site where the perched zone is affected. The perched zone typically yields about 10 gallons per day sustained yield. We have public water supply wells within 1/2 mile that are screened in the underlying groundwater-bearing unit. These public supply wells may also be screened across the perched zone, and in some cases, we probably won't be able to get sufficient information to determine the location of screens relative to the perched zone.**

**Do we need to treat the perched zone as Class 1 groundwater? Clearly we need to treat the lower groundwater-bearing unit as such. To complicate matters, remediation of the perched zone is very difficult in my experience, and people have dropped significant amounts of cash attempting to clean it up to MCLs.**

**A).** In general, each discrete groundwater-bearing unit should be evaluated on its own merit as far as classification. It is somewhat up to the person to figure out how much of a lump or splitter they choose to be, subject to TNRC concurrence of course. If the shallow perched zone qualifies as Class 2 or 3, so be it. However, when it comes to response objectives, the perched zone has to be managed such that the response objectives for any other connected groundwater-bearing unit can be achieved. So, in particular instances, a Class 3 groundwater may have to be aggressively cleaned up if it is in natural or man-induced hydraulic communication with a Class 1 or 2 groundwater and prevents the response objectives for the Class 1 or 2 groundwater from being met. But if that is not the case, then the shallow perched zone will be managed according to its classification and the underlying Class 1 will be managed according to its classification.

In this particular instance, however, the presence of the public water supply wells adds a complication. If the COCs in the perched zone enter into the wells, then by default, the perched zone is a Class 1 groundwater (§350.52(1)). It is up to the person to prove the perched zone is not a Class 1 groundwater in this instance (i.e., not a threat to the public water supply wells).

### **§350.53 Land Use classification**

**Q). Is agricultural land commercial/industrial or residential?**

**A).** Agricultural land use is included with the two land use classifications included in the rule. Areas in which there is not a residence, such as areas of crop or pasture land are commercial/industrial land use. The exposure scenario in this instance is a worker like that for commercial/industrial properties. Any areas in which there is a residence (e.g., a limited area of a farm) is classified as residential. Thus, it will be a site-specific determination based upon the presence or absence of residences which will determine whether the surrounding land will be classified as residential or commercial/industrial. However, in order to assume commercial/industrial land use, the landowner must consent to the placement of an institutional control. Without the institutional control, residential land use must be assumed.

**Q). What is the appropriate land use classification for open tracts of land that don't seem to exactly match the classifications for commercial/industrial or residential yet still have some amount of human activity, such as parks, golf courses and nature preserves?**

**A).** In general, any land use classification is made by comparing the current use to the definitions for commercial/industrial or residential land use in §350.4(a) and making the call. In the case of parks, the definition for residential land use specifically cites parks, along with day care facilities, educational facilities and hospitals for inclusion in this land use because of the similarity to residential exposure potential and the sensitive nature of the potentially exposed population. Golf courses and country clubs are classified as commercial/industrial. The commercial/industrial land use definition makes use of the North American Industry Classification System (NAICS) codes (see next question for more details). The particular NAICS code for this example, 71391, is part of the broader category of Code 71 - Arts, Entertainment and Recreation which is defined as commercial/industrial. Note, however, that in locations where the golf course is contained within a park, the total acreage (park with golf course) will be considered to be residential. Nature preserves and other similar institutions with NAICS code 71219 such as bird sanctuaries, etc., are considered residential even though this land use activity falls in the same general category as golf courses. This is the only code which is specifically excluded from Code 71, therefore nature preserves are classified as residential. Bear in mind that if an affected property extends into a golf course (or any other property that is classified as commercial/industrial), the person must regard the land use as residential unless the owner agrees to the filing of an institutional control reflecting commercial/industrial land use.

**Q). Since the definition for commercial/industrial land use relies on North American Industrial Classification System (NAICS) codes, how can I find out if a particular activity is covered by a code number included in the definition or if it is excluded from the commercial/industrial classification?**

**A).** The North American Industrial Classification System (NAICS) provides code numbers for almost all activities of industry and commerce. The code numbers start at 11 and go through 92 to define 24 major headings. The more digits there are in the code, the more specific is the classification. For instance, the TNRC would come under 92 - Public Administration, 924 - Administration of Environmental Quality Programs, 92411 - Air and Water Resource and Solid Waste Management. Affected property that has land use activities described by the NAICS codes will meet the definition for commercial/industrial land use (§350.4(a)(13)), unless a specific NAICS code is excluded from the definition. For the convenience of the user, the excluded NAICS codes and descriptions are provided below. These particular activities will result in a residential land use classification.

22131 Water supply and irrigation systems  
61111 Elementary and secondary schools  
61121 Junior colleges  
61131 Colleges, universities and professional schools  
62211 General medical and surgical hospitals  
62221 Psychiatric and substance abuse hospitals  
62231 Specialty (except psychiatric and substance abuse) hospitals  
62311 Nursing care facilities  
62322 Residential mental health and substance abuse facilities  
623311 Continuing care retirement communities  
623312 Homes for the elderly  
62399 Other residential care facilities  
62441 Child day care services  
71219 Nature parks and other similar institutions  
721211 Recreational vehicle parks and campgrounds  
72131 Rooming and boarding houses  
92214 Correctional institutions

The U.S. Census Bureau maintains the definitive website on NAICS codes at this address:  
<http://www.census.gov/epcd/www/naics.html>.

## §350.54 Data Acquisition and Reporting Requirements

**Q). Are soil results to be reported on a wet weight or dry weight basis?**

**A).** Report soil results on a dry weight basis.

**Q). What is the difference between the method detection limit (MDL) and the method quantitation limit (MQL) or sample quantitation limit (SQL)?**

**A).** The MDL is the level above which the laboratory should be able to detect and report a COC as being present in a laboratory clean sample. The MQL is level above which the laboratory should be able to quantify the concentration of a COC in a sample, and is defined in Method SW846-8000B and is equal to the concentration of the lowest non-zero standard in the laboratory's initial calibration curve adjusted for volume or weight of the sample used. The SQL is the level above which the laboratory should be able to detect a COC in an environmental sample.

**Q). I don't see a difference between "detect and report" and "quantify," so the method detection limit (MDL) and the method quantitation limit (MQL) would be the same number. The sample quantitation limit (SQL) could be different if the sample had to be diluted, etc.**

**A).** The MDL and the MQL should not be the same number. The MDL is the concentration at which the analytical system can detect the presence of a COC. However, the value reported for that response is estimated, because in order to report a response as quantified, the response must be bracketed by calibration standards and/or analytical spikes. Above the MDL but below the MQL, i.e., the lowest non-zero standard in the laboratory's initial calibration curve, the responses are not bracketed by calibration standards and/or analytical spikes, so the values reported must be qualified as estimates. At and above the MQL the laboratory can report values as quantified (unless some other QC failure has occurred) provided that the response fall between the MQL and the highest calibration standard. If the response exceeds the highest calibration standard, the response is no longer bracketed by standards and must be qualified as estimated. The SQL is specific to each sample and should reflect the sample characteristics, any cleanup and/or preparation procedures performed on the sample, and any laboratory adjustments made to the sample during the analysis.

## §350.55 Notification Requirements

**Q). Paragraph §350.55(a) states that notification of data availability has to be provided to the landowner "no later than at the time of submission of a plan and/or report for the executive director's review which contains this information." What constitutes a plan and/or report? Are draft reports considered a plan and/or report without TNRCC's review?**

**A).** The intended trigger is the submittal of the information as part of any of the plans and reports described in Subchapter E. However, the rule could include other forms of submittal (e.g., e-mail, fax, or letter) when there is no intent to include that information in a plan or report.

**Q). Can the information required to be available be placed in our company files or library to serve as a source where this information can be obtained? In other words, can we just notify the property owner when the information is placed in the library?**

**A).** No. The rule does not allow you to just place the information in an accessible location for inspection by members of the public instead of providing actual copies of the applicable information upon request. To only require placing the information in an accessible location will be an undue burden on potentially impacted parties (e.g., where an easement, franchise or right-of-way is held by another person). Note that you can place information in an accessible

location for inspection by members of the public and make this fact known in the notice of availability of information as long as it is clear that the person can request the information directly from the person providing notice.

**Q). Does area wide information need to be supplied or just to the specific landowner's property?**

**A).** Just information specific to the landowner's property. However, realize that pursuant to §350.55(b), the basis of notice may be interpolation between data collected on other properties. In this regard, the information may be more encompassing.

**Q). Instead of sending a notice of availability, we mailed letters with analytical results to the off-site property owners where groundwater samples were collected. Copies of these letters were included in our report to the TNRCC. So in this instance, the notice of availability was by-passed. Can we submit a notarized statement stating letters with this information have already been sent out which fulfills the requirements of §350.55(a)?**

**A).** Yes, provided all information regarding those samples was sent to those landowners. If there is other available information relative to those samples, then further notice would be warranted. Additionally, the required notarized statement indicates all of §350.55 was complied with. This statement is still needed.

## Subchapter D Development of Protective Concentration Levels

### §350.71 Application of PCLs

**Q). Do PCLs apply to bedrock? Specifically, if a limestone bedrock with clay-filled features (solution cavities, fractures, etc.) is considered bedrock, and soil RBELs and PCLs are calculated based upon exposure to soil, is it required under TRRP that soil PCLs be applied to bedrock?**

**A).** Yes, if the material meets the definition for bedrock and is above the top of the groundwater-bearing unit, then the zone would be considered a subsurface soil and would be subject to the subsurface soil exposure pathways and PCLs. The primary exposure pathways for which subsurface soil PCLs are developed are leaching of COCs from subsurface soils to groundwater (i.e., <sup>GW</sup>Soil) and inhalation of volatile emissions from COCs in subsurface soils (i.e., <sup>Air</sup>Soil<sub>Inh-V</sub>). However, if the material does not meet the definition for bedrock, is above the top of the groundwater-bearing unit, and is less than 15 or 5 feet in depth for residential or commercial/industrial land use, respectively, then the material would be classified as surface soil and the surface soil PCLs would be relevant. The primary exposure pathways for which surface soil exposure pathways and PCLs are developed are leaching of COCs from surface soils to groundwater (<sup>GW</sup>Soil) and the combined pathway of inhalation of volatile emissions and particulates from COCs in surface soil, dermal contact with COCs in surface soil, ingestion of COCs in surface soil, and for affected residential properties, ingestion of above and below-ground vegetables grown in surface soils (<sup>Tot</sup>Soil<sub>Comb</sub>). The primary difference between surface and subsurface soils in this regard is that, due to the unlikelihood of direct receptor contact, PCLs are not established for subsurface soils for the following exposure routes: ingestion, inhalation of particulates, dermal contact, and ingestion of above and below-ground vegetables.

**Q). What is the PCL for iron?**

**A).** The TNRCC has determined that iron is unlikely to be a human health concern, and thus, we PCLs have not been developed for iron. However, iron contamination could be a concern for other reasons (e.g., aesthetics, ecological impacts) and it is at the TNRCC project manager's discretion of how the matter should be addressed.

### §350.71(k)(1) COC screening from PCL development

**Q). Does the COC screening procedure described in §350.71(k)(1) take ecological receptors into account?**

**A).** Yes. As described in the first sentence of §350.71(k), for both human health and ecological PCL evaluations, the person shall establish PCLs for each individual COC unless the conditions of paragraphs (1), (2), or (3) of this subsection are met. This screening provision is also subject to the possibility that use of paragraphs (1), (2), or (3) may be prohibited by an individual program area.

Section 350.71(k)(1) states that PCLs do not need to be established for a COC in a particular medium if the COC is detected in at least one sample and all detected concentrations of the COC are less than the residential assessment level in the environmental medium being evaluated as well as in all other environmental media from which samples were collected.

The definition for assessment level is presented at §350.4(a)(3). In short, an assessment level is a critical PCL for a COC where the human health PCL is established under a Tier 1 evaluation except for the soil-to-groundwater exposure pathway and where the ecological PCLs are developed, when necessary, under Tier 2 and/or 3 of the ecological risk assessment process. So the lower concentration of the human health and ecological PCL is used as the assessment level.

The statement in §350.71(k)(1) that the COC concentrations must be compared to the residential assessment levels means that residential land use must be assumed when calculating the human health PCLs used in determining the

assessment levels. The reference to residential assessment levels does not negate the requirement to determine ecological PCLs, when necessary, when determining the assessment level. In conclusion, the COC screening procedure in §350.71(k)(1) takes both human health and ecological PCLs into full consideration.

### **§350.72(b) Cumulative Risk Level**

**Q). Do I have to do a cumulative risk adjustment for all pathways or just the critical ones?**

**A).** Conduct the cumulative risk adjustment on all pathways. Section 350.72(b) requires a cumulative evaluation for all pathways prior to selecting the critical PCL.

**Q.) Do I have to look across all tiers with the cumulative evaluation?**

**A).** Yes. Section 350.71(k) states that the cumulative evaluation must include all COCs across all tiers.

**Q). Do COCs that were never detected have to be included in the cumulative check?**

**A).** Yes, in accordance with §350.71(k). Non-detects must be assigned an appropriate proxy based on §350.51(n).

**Q). Does the cumulative adjustment have to be conducted before COCs are screened out under 350.71(k)?**

**A).** No. First, COCs are screened according to §350.71(k). Cumulative adjustment is taken into account when developing PCLs for those COCs that were not screened out after applying §350.71(k). Those COCs screened from PCL development are not included in the cumulative adjustment.

### **Figure §350.73(e)(1)(A) Definition of clay**

**Q). How is "clay" defined? Do I have to use a hydrometer test procedure to make this judgment or could a sieve analysis also be used.**

**A).** We are using the particle size classification published by the U.S. Department of Agriculture (USDA) in which the separation between clay-sized particles and silt-sized particles is 0.002 millimeter (2 microns). The finest sieve, 200 mesh, has a sieve opening of 0.074 millimeter which is very close to the break between silt and sand-sized particles. Thus, sieves are too coarse to measure the amount of clay in a sample and if this measurement is needed then a hydrometer must be used. "Clay" is also used as a soil material classification, according to the USDA textural classification triangle, for material which contains more than 40 percent clay, less than 45 percent sand, and less than 40 percent silt. When the soil classification is clear and unambiguous, an experienced field person may use a field method based upon "feel" to determine the class name of a soil. Thus, the laboratory hydrometer method need not always be used but should be used whenever there is or could reasonably be any question regarding soil classification. In other words, if it is a close call and there could reasonably be disagreement about the soil classification, then the laboratory method should be used to support your determination.

### **§350.74(j)(1)(C) Bioavailability studies**

**Q). Does the TRRP rule allow a simulated bioavailability extraction test to demonstrate lower bioavailability of site-specific soils?**

**A).** The rule clearly requires site-specific evaluations, and the agency is open to listening to a case for why this extraction test demonstrates site-specific availability. The science may someday move toward these types of tests

(as they did with TCLP, SPLP for demonstrating non-leachability). However, the agency will have to be very comfortable that the extraction tests are realistic, and even then it will require a "weight of evidence" type approach. Using this type of approach, data from extraction tests, coupled with supporting info from the scientific literature, and possibly mineralogical evaluations and assessment of how long the contamination has been in place, and other evaluations will be necessary.

### **§350.75 Tiered Human Health PCLs**

**Q). Do I have to use the same Tier to determine human health PCLs for each COC?**

**A).** No. The intent of the tiered process is to allow you to use whatever tier is appropriate for a given COC and exposure pathway. If you want to do the extra work involved in Tier 2 or 3 evaluation for a COC, you can. Multiple COCs (i.e., 10 or more) must be tested with the cumulative check for risk or hazard with possible downward adjustment, regardless of which tier was used. For example, if there are more than 10 carcinogens acting through the same exposure pathway, and PCLs were set for some COCs under Tier 1, for other COCs under Tier 2, and for other COCs under Tier 3, the cumulative check is required and it is conducted across the PCLs for each COC regardless of the tier each individual PCL was set. Do not segregate out Tier 1 from Tier 2 for Tier 3 and run only a tier by tier cumulative check. This is explained in Section 350.72.

### **§350.75(b) Tier 1 PCLs, Source Area Size**

**Q). My source area is more than 30 acres in size. Can I use the Tier 1 PCL tables to establish PCLs?**

**A).** No. Source areas greater than 30 acres for a given COC must be addressed with Tier 2 or Tier 3 PCLs to account for the larger size. This is an interpretation of 350.75(b)(3).

**Q). Can I extrapolate the size of my source area between 0.5 acre and 30 acres to establish a Tier 1 PCL?**

**A).** No, you may not extrapolate between a 0.5-acre source area and a 30-acre source area to determine a **Tier 1 PCL**. Under Tier 1, you must use either the 0.5 acre or the 30-acre PCL, depending on the size of the source area. A 0.5 acre source area is used to determine the PCL when the source area is equal to or less than 0.5 acre and a 30-acre source area is used to determine a PCL when the source area is greater than 0.5 acre but not larger than 30 acres. Under Tier 1, Extrapolations between the two are not permitted. However, under Tier 2, you may modify the groundwater source width and other site parameters so as to develop a site-specific PCL, or "extrapolate" for larger (>30 acre areas) using the approximate equation for the source area (Q/C) curve as presented in §350.75(b)(1).

### **§350.75(i)(7)(C) Pathway specific PCL considerations**

**Q). I used TCLP instead of SPLP to test leachability of contaminated soil at my affected property. The results of TCLP for soil is nondetected and I want to close the site under Tier 3, Remedy Standard A. Is the TCLP test appropriate under TRRP?**

**A).** TRRP does not require SPLP, but only mentions SPLP as an example in §350.73(e)(1). Section 350.75(i)(7)(C) just states that "appropriate leachate test results" may be used. Assuming it was appropriately applied, it is fine.

## §350.76(g) Total Petroleum Hydrocarbons

Q). I am trying to determine Tier 1 PCLs for TPH, and have been given limited data.

TNRCC Method 1005 laboratory analytical results from a soil sample indicate a >C12 to C28 concentration of 500 mg/kg, and a >C28 to C35 concentration of 300 mg/kg. Our purpose is to determine screening standards for TPH constituents and determine whether the reported concentrations exceed these screening standards.

I have read the TNRCC guidance document *Development of Human Health PCLs for TPH Mixtures (RG-366/TRRP-27)* and reviewed the Tier 1 PCLs tables, and have concluded that more data may be needed or the TNRCC may already have generic TPH Tier 1 PCLs that may be used as screening standards. With the supplied data, can a Tier 1 PCL be determined for TPH? Does the TNRCC list a generic PCL for these boiling points?

A). Referring to Step 4 in the TNRCC guidance document *Development of Human Health PCLs for Total Petroleum Hydrocarbon Mixtures (RG-366/TRRP-27)*, the results from TNRCC Method 1005 analyses can be used for screening as follows:

Compare the TNRCC Method 1005 concentration measurement for the C6 to C12 range to the Tier 1 PCL for the aromatic >C8 - C10 boiling point range that is appropriate for the exposure pathway applicable to the affected medium as defined in §350.71(c).

Compare the TNRCC Method 1005 concentration measurement for the C12 to C28 (or if applicable, C35) range to the Tier 1 PCL for the aromatic >C12 - C16 boiling point range that is appropriate for the exposure pathway applicable to the affected medium as defined in §350.71(c).

The development of a PCL for the TPH mixture is only warranted if the TNRCC Method 1005 results exceed the >C8 - C10 or the >C12 - C16 boiling point range Tier 1 PCLs. If either of these Tier 1 PCLs are exceeded, the guidance lists several alternatives. If neither of these PCLs are exceeded, then no further action is needed.

## §350.78(b) Solubility

Q). The groundwater Tier 1 PCLs have the notation of >S if the solubility limit was exceeded during calculation. Is the PCL based on the solubility limit or on the risk-based calculation?

A). When the Tier 1 groundwater PCLs are flagged with >S, the solubility limit is exceeded and the values are risk-based (solubility limit isn't used as a cut-off value). Even though the risk-based value is used as the official Tier 1 PCL, the solubility flag should clue the user to the fact that the solubility is the limiting criteria, and therefore that exposure pathway is essentially automatically protective for that COC. In other words, you can't exceed the risk-based value. At that point, the COC concentration may only be relevant from a cumulative check, but even then, it may potentially contribute so little risk or hazard, that it may not really matter in that regard either. This may have some bearing when the extent of the assessment was terminated close to the assessment level, but actually did not meet it, or if there is a sample QA/QC question. Given that the COC really can't be unprotective for that exposure pathway, the TNRCC may exercise additional discretion and flexibility.

Q). How were solubility limits determined? Is this explained somewhere in the rule or preamble or guidance?

A). The solubility values are locked down in rule and presented in the chemical/physical properties table. They came from various references, which are listed in the 1996 Concept Document. When COCs are comprising a mixture, then effective solubility may be considered under Tier 2 or 3.

## §350.78(c) Background and Critical PCL

**Q). If a facility established an anthropogenic background concentration for a specific COC in soils, and that background concentration exceeds the Tier 1 soil PCL, then would that background concentration become the critical PCL, and would this mean no further cleanup is required?**

**A).** Section 350.78(c) specifies when background can serve as the critical PCL. If a COC satisfies the definition for anthropogenic background [discussed in 350.4(a)(6) - Background], and the calculated PCL is less than that background value, then background becomes the critical PCL. See also the discussion of critical PCL in 350.78(a). It is the lowest of all applicable PCLs for a given COC (human, and ecological as appropriate) for the environmental medium in question, considering all applicable exposure pathways.

Also be aware that you aren't limited to the Tier 1 values of the tables when you determine the critical PCL. For example, in a simple case for surface soil, you compare PCLs from any tier for the <sup>Tot</sup>Soil<sub>Comb</sub> PCL and the <sup>GW</sup>Soil PCL. The lower of those two PCLs is the critical PCL assuming no other pathways apply. If the background concentration for that COC is a higher concentration than the background concentration becomes the critical PCL. The TRRP rule does not intend for cleanups to be done to levels lower than the background concentration. No cleanup will be required so long as that background concentration serving as the critical PCL is not exceeded.

## §350.79 Comparison of COC Concentrations to PCLs

**Q). I have a problem with some of the PAHs with really low PCLs. We often run PAHs by Method 8270. The MQL for some of these PAHs is at or above the PCL. That is not a problem if the SQL is equal to the MQL. If there is any dilution of the sample, however, the SQL will be above the PCL. To screen out these PAHs (which have not been detected at any point on the site) we would need to run a different method in order to get a lower SQL. Normally this will involve taking another sample since the holding times have usually expired long before I get a look at the data. So, my question is: What do I do with the first sample with the high SQL? Can I throw out that value?**

**A).** If PAHs are COCs at the affected property, then the person needs to demonstrate that concentrations of PAHs do not exceed the critical PCL or assessment level. If the PAHs are reported as not detected, then the reported SQLs must be below the critical PCL or assessment level. If the SQLs exceed those regulatory limits, the person can pursue relief under §350.79 provided it can be demonstrated that the person used reasonably available technologies in attempt to lower the SQLs. In the case of PAHs, a reasonably available technology that would most likely provide adequate SQLs is 8270 using select ion monitoring or 8270-SIM.

**Q). I am still not clear about "lowering the SQL" if the holding time has expired on the original sample and I have to take a new sample. Can I eliminate the SQL of the original sample from consideration?**

**A).** If the holding time has expired on the original sample and a new sample has been collected, the original sample results can be discarded. Data being used to demonstrate compliance with TRRP must be of known and documented quality. Depending on the COC, if the holding time has expired thereby introducing an unknown but suspected low bias, one would neither know nor be able to document the quality of the reported results (§350.54(b)), and the sample should be recollected. "Lowering the SQL," as cited in §350.79(a), is not synonymous with a low bias, and the two should not be confused. The SQL can be lowered by the laboratory's using a more sensitive method, cleaning up the sample, or modifying the method.

## Subchapter E Reports

### §350.91 Affected Property Assessment Report (APAR)

#### Q). When do I submit the APAR?

A). Submit the APAR no later than the first report (Response Action Plan (RAP), Response Action Effectiveness Report (RAER), or Response Action Completion Report (RACR)) due date. For a self-implemented Remedy Standard A situation, submit the APAR with the first RAER three years after filing the Self-Implementation Notice.

#### Q). We have already submitted investigation reports. Will these reports constitute the APAR?

A). This question is not answerable on a policy basis. This would be a site-specific decision based upon the contents of the documents. Provided these documents attained the assessment requirements of Subchapter C (pertaining to Affected Property Assessment) and the informational requirements of §350.91(b), these would constitute a complete APAR. Otherwise, they would not. There is no intent, however, to make people resubmit data in an APAR format solely for the sake of format.

#### Q). What is the mechanism for fulfilling the APAR requirements for a site when all of the information is contained in previously submitted reports? Will the TNRCC recognize all reports as it applies to a site as part of the APAR?

A). We will recognize previously submitted information and, no, all previously submitted information need not be resubmitted. To use previously submitted information you must carefully document in the APAR the location of all information which is being incorporated by reference. The submitted document with all of the incorporated material must, in total, meet the assessment requirements of Subchapter C and the informational requirements of §350.91(b). Individual program areas may require all assessment information for an affected property to be consolidated into a single document.

### §350.91-.96 Reports

#### Q). I understand that the agency has not yet developed all of the report forms described in Subchapter E. How do I submit the reports that are needed?

A). The agency is working on developing standard report formats for all the reports mentioned in Subchapter E. In the meantime, write your reports as usual, but be sure to include all of the information required. This includes information needed to show compliance with all applicable parts of the rule, even if it is not specifically listed in Subchapter E.

### §350.92(a)(6) Self-Implementation Notice

#### Q). §350.92(a)(6) states that the SIN will include an "acknowledgment that any permits needed to implement the remedy will be obtained prior to implementation." Does this include permits issued by entities other than the TNRCC such as local governments?

A). Yes, this includes permits issued by entities other than the TNRCC. For example, there could be RCRA permit matters or other federally triggered matters or other permits required by smaller units of government as well. The intent is to put you on notice that permits may be required and in order to comply with TRRP, those permit requirements are to be met as well.

## **§350.94 Response Action Plan**

**Q).** Section 350.94(i) requires that a copy of the institutional control that will be filed to be included in the response action plan (RAP). The standard requirements of the institutional control are listed in §350.111(a). Some of the provisions, such as §350.111(a)(1) for example, require specific locational information that may not be fully available until the remedy is actually employed. For example, in the case of application of an impervious cap under Remedy Standard B, the metes and bounds description of the institutional control would not be surveyed in by the professional land surveyor required in §350.111(a)(3) until the cap is in place. How should this be handled?

**A).** The intent of §350.94(i) is to ensure two things. First, that the person does not lose sight of the fact an institutional control may be applicable. Second, to provide the TNRCC a chance to verify the appropriateness and clarity of the exact institutional control language that is planned for compliance with §350.111(a)(4)-(6), except for any specific locational details that cannot be known until the response action is complete. The RAP will likely include figures of the area to which the planned remedy will apply in order to comply with §350.94(g) and the person can use that to confirm the general area where the institutional control would be applied. Additionally, as part of the RAP, the person should make commitments to provide the required details in the final institutional control before the control is filed. As part of the RAP approval, it is recommended that the TNRCC project manager use §350.94(l) and §350.95(e) to direct the person to include those specific locational details in a draft of the final institutional control, and to submit it for review with the RACR.

## Subchapter F Institutional Controls

### §350.111(a)(5) Institutional Controls

**Q). If two or more COCs, such as arsenic and a pesticide, are present in a groundwater-bearing unit, should a person list only one or both in the institutional control or simply note the fact that the groundwater use is restricted?**

**A).** The specific text to be included in an institutional control is not described as clearly under TRRP as it is in the Chapter 335 Risk Reduction rule (RRR). However, §350.111(b)(3) requires the person to describe in the institutional control “the reason the physical and/or institutional control must remain in place to be protective of human health and the environment. . .” Also, §350.111(a)(5) states that deed notices, VCP certificates of completion and restrictive covenants shall include “an explanation as to which environmental media contain COCs above PCLs.” §350.111(a)(5) means that a specific description of the location of the PCLE zone must be included in the institutional control rather than a more generic statement such as the groundwater contains COCs above the PCLs.

All COCs present at concentrations above the critical PCLs at an affected property must be recorded within an institutional control. The identification of all COCs above the critical PCLs is necessary in order to provide meaningful and accurate information to describe why, in response to §350.111(b)(3), the physical and/or institutional control must remain in place. A person examining the institutional control in the future may be persuaded by the listing of COCs above the critical PCLs to refrain from disturbing an engineering control that he would otherwise disrupt if provided less complete information.

Also, a listing of all COCs with concentrations in groundwater above the critical PCLs is necessary to satisfy the requirement of §350.111(a)(5) to describe which environmental media contain COCs above PCLs. Also, for groundwater, the location and extent of the institutional control is based upon the groundwater PCLE zone. That COC which migrates the furthest in a particular direction with a concentration greater than the critical groundwater PCL defines the limit of the groundwater PCLE zone in that direction. When this evaluation is performed for all COCs in all directions, the extent of the COCs exceeding critical PCLs is defined. This defines the limits of a groundwater PCLE zone. A groundwater PCLE zone is based upon all COCs present in an affected groundwater-bearing unit rather than on a COC-by-COC basis. The various COCs in an affected groundwater-bearing unit will migrate at different velocities over time. This too supports listing all COCs above the critical PCLs in an institutional control so that information is readily available over time to verify the configuration and extent of the groundwater PCLE zone.