



Determining Which Releases are Subject to the Texas Risk Reduction Program Rule (TRRP)

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Key Guidance and Links

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- ▶ Current Guidance: “Determining Which Releases Are Subject to TRRP” found at:
www.tceq.texas.gov/assets/public/remediation/trrp/releasesTRRPrev.pdf
- ▶ Helpful Links:
www.tceq.texas.gov/remediation/trrp/guidance.html (TRRP Guidance and Forms)
www.tceq.texas.gov/remediation/trrp/trrppcls.html [Total Petroleum Hydrocarbon-Mixture calculator and Protective Concentration Level (PCL) tables]



Pre-Requisites for Our Evaluation

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Notice of release sent to TCEQ in accordance with the Texas Water Code (TWC) and applicable program rules

- ▶ All source areas adequately identified
- ▶ Samples properly collected and analyzed for chemicals of concern (COCs)
- ▶ The release is assessed to less than Action Levels
- ▶ Groundwater must be sampled for COCs at source area where soil-to-groundwater ($^{GW}Soil_{Ing}$) action level is exceeded if soil is excavated, or Synthetic Precipitation Leaching Procedure (SPLP) is performed

If any of these conditions are not met, the release is subject to TRRP



Release Defined

Pick one:

- ▶ Spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment

Release not defined by:

- ▶ Concentrations, quantities, rates, or durations





Release

Other statutes, rules, and guidance define actionable thresholds

Some examples:

- ▶ Statutes: Texas Water Code 26.301, Texas Health & Safety Code (THSC) 361.003,
- ▶ Rules: 30 Texas Administrative Code (TAC) Chapters 327 (Spill Rules), 334 (PST Rules), 350 (TRRP)



Considerations for Selecting COCs

- ▶ Does assessment indicate that metals, organics, or 'other' were used in processes at the site?
- ▶ Do you have process knowledge, waste streams, historical operations, etc.?
- ▶ Metals
 - ▶ Exceed the Texas-Specific Soil Background Concentrations [30 TAC 350.51(m)]?
 - ▶ Within the range of established background or anthropogenic background?

Note: RG366/TRRP-10 Selecting Target COCs

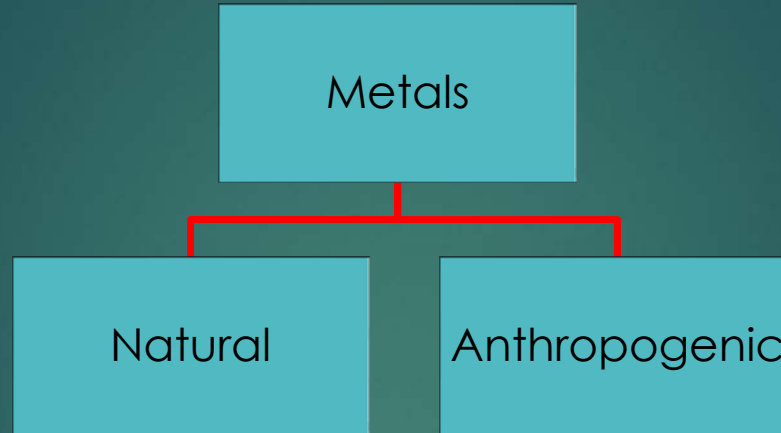


The Problem with Metals

- ▶ Metals can occur naturally in soil – detection is likely
 - ▶ Arsenic (As)
 - ▶ Barium (Ba)
 - ▶ Cadmium (Cd)
 - ▶ Chromium (Cr)
 - ▶ Lead (Pb)
 - ▶ Mercury (Hg)
 - ▶ Selenium (Se)
 - ▶ Silver (Ag)



Metals - Background



- ❖ Background: Need statistical demonstration
- ❖ Background samples: close to, but not impacted by affected property

Background

Texas-specific (in the rule)

Site-specific (calculate)



SPLP Tests

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- ▶ SPLP = Synthetic Precipitation Leaching Procedure (SW-846 EPA Method 1312)
- ▶ Common Practice:
 - ▶ Compare SPLP results to Groundwater PCL from Table 3 of Tier 1 PCL Lookup Tables

Example – Arsenic:

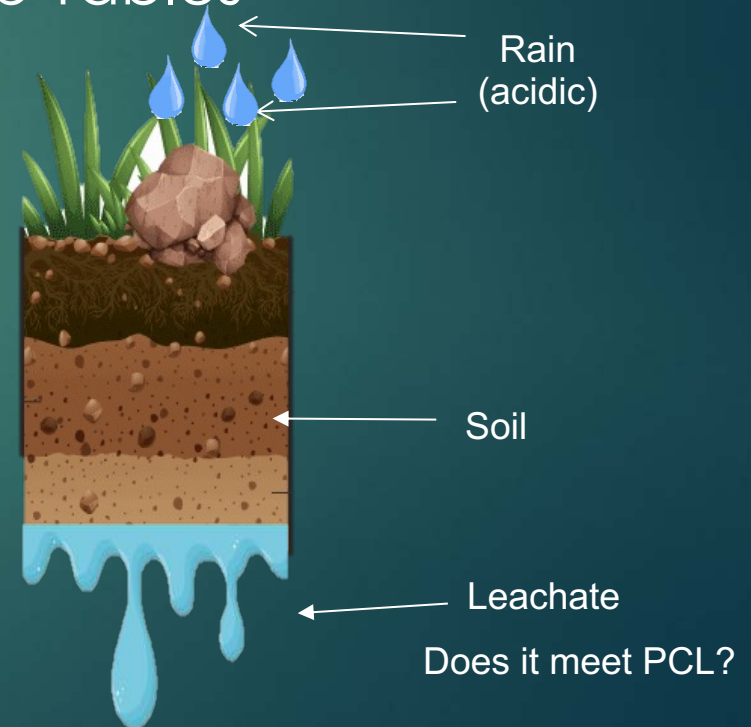
Soil conc. = 23 mg/kg

Leachate = 0.008 mg/L

Water PCL = 0.010 mg/L

Is Soil protective of Groundwater?

Yes ☒ No ☐





Exposure Pathways

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Lowest Tier 1 Residential PCL for 0.5-acre
Source Area and Class 1 Groundwater
for All Applicable Human Exposure Pathways

Media	TotSoil _{Comb}	GWSoil _{Ing}	AirSoil _{Inh-V}	Bkg/MQL
Surface Soil	X	X		X
Subsurface Soil		X	X	X
Media	GW GW _{Ing}	Air GW _{Inh-V}	Bkg/MQL	
Ground water	X	X	X	

If Bkg/MQL > PCL, use higher of Bkg or MQL as the Action Level

For metals, use the higher of Bkg/Action Level

PCL: Protective Concentration Level; GW: groundwater; Bkg: background; MQL: method quantitation limit



Applicable Scenarios

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Scenario	Trigger	Corrective Action	Report
1 No Release	$COC \leq MQL/Bkg$	None	No Report – No Deadline
2 < Action Levels	$MQL/Bkg < COC < \text{Action Level}$	None	Letter report – No Deadline
3* > Action Levels	$COC > \text{Action Level}$	Remove/Decon to PCLs or SPLP	Letter report, corrective action finished < 60 days

Any other situations that don't meet Scenarios 1, 2, or 3 and the basic assumptions for use of 11/19/10 memo must follow normal TRRP process and standard reports (e.g., APAR) to utilize full TRRP flexibility. Note that Scenarios 2 and 3 require submittal of a Tier 1 ecological exclusion checklist. *Option to excavate or SPLP analysis



Scenario 1

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No TRRP standardized reports required when:

- ▶ COC concentrations are less than or equal Bkg/MQL
 - ▶ Can establish site-specific Bkg or Texas-Specific Soil Background Concentration
- ▶ No response actions used to achieve Bkg or MQL

Other program requirements could apply – such as rule, permit, or enforcement; whichever is more stringent



Example

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Phase II Investigation at Billy's Battery Barn



Scenario 1 - COC Concentrations Less Than or Equal to MQL or Bkg

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- ▶ Samples collected around shop area for 8 RCRA metals
- ▶ Sample results were below sample detection limit except for lead at 6 mg/kg ($^{GW}Soil_{Ing} = 3.0$ mg/kg)
- ▶ However, Texas-Specific Soil Background Concentrations for lead is 15 mg/kg
- ▶ No Further Action required/ No report required

TRRP Applies?

Yes

☐

No

☒



Scenario 2 - COC

Concentrations > MQL/Bkg but <
Action Levels

Use letter report with completed Tier 1 Eco Exclusion Checklist to provide findings to TCEQ:

- ▶ Passes Tier 1 Eco Exclusion Criteria checklist,
- ▶ COC concentrations < Soil Action Levels,
- ▶ No evidence of other affected or threatened media

TRRP Applies? Yes ☐ No ☒



Example

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Phase II Investigation at Pete's Metal Plating Shop



Scenario 2 – COC Concentrations > MQL/Background but < Action Levels

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- ▶ Samples collected around shop area for 8 RCRA metals
- ▶ Sample concentrations were below sample detection limit (SDL) except for chromium (total) at 72 mg/kg
- ▶ Texas-Specific Soil Background Concentration for chromium (total) is 30 mg/kg; however, the lowest PCL ($^{GW}Soil_{Ing}$) is 2400 mg/kg (action level)
- ▶ Site passes Tier 1 Eco Exclusion Checklist
- ▶ No Further Action required - Submit report to TCEQ

TRRP Applies? Yes ☐ No ☒



Scenario 3 COC concentration in Soil is $>^{GW} \text{Soil}_{\text{Ing}}$ Action Level

Will TRRP apply with any of the following conditions?

- ▶ Site fails Tier 1 Eco Exclusion Checklist
- ▶ COC concentrations in soil exceed Action Levels, and soil options are not used or still exceed Action Levels following implementation of options
- ▶ Groundwater sampling not feasible or not conducted
- ▶ COC concentrations in groundwater exceed Action Levels

TRRP Applies? Yes ☒ No ☐



Scenario 3 - continued

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TRRP may not apply if:

- ▶ COC concentrations in soil exceed Action Levels but soil options used (excavation/SPLP) to address the release
- ▶ Groundwater is not impacted and
- ▶ Passes Tier 1 Eco Checklist



Scenario 3 – COC concentration in Soil is $>^{GW}Soil_{Ing}$ Action Level: Excavate or SPLP Testing

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Option A	Option B
Excavate	SPLP Test

- ▶ SPLP Action Level is $^{GW}GW_{Ing}$ (Class 1 Res PCL)
- ▶ SPLP test can be done before, after, or in lieu of excavation
- ▶ Use of SPLP test is not an option to address exceedance of $^{Tot}Soil_{Comb}$ or $^{Air}Soil_{Inh-v}$ pathways



Scenario 3 - COC concentration in Soil

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is $> \text{TotSoil}_{\text{Comb}}$ or $\text{AirSoil}_{\text{Inh-V}}$ Action Level

Soil Pathway	Option
$\text{COC} > \text{TotSoil}_{\text{Comb}}$ $\text{COC} > \text{AirSoil}_{\text{Inh-V}}$	Excavate



- ▶ Excavate and resample to verify COC concentrations are below Action Levels
- ▶ A representative GW sample is below Action Levels
- ▶ Properly dispose affected soil within 60 days from the date the release was reported to the agency
- ▶ Submit a report with Tier 1 Eco Checklist documenting the actions taken and justification for no further action



Examples - continued

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Excavation at Moe's Gas & Splash



Scenario 3 – *Option A. Excavation and Proper Disposal of Affected Soil*

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- ▶ Fuel release from an overturned tanker truck - Soil samples were collected from the base of the preliminary excavation.
- ▶ Soil analytical results determined that BTEX, TPH, and PAHs were above the $^{GW}Soil_{Ing}$ Action Levels
- ▶ Additional excavation was conducted. Confirmation samples now below Action Levels and GW sample =ND
- ▶ Tier 1 Eco Checklist passes
- ▶ Submit a Report of Findings to the TCEQ

TRRP Applies? Yes ☐ No ☒



Example

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Phase II at Joe's Truck Wash



Scenario 3 – *Option B. SPLP Analysis to Determine COC Leachability*

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- ▶ Several borings installed around an oil/water separator
- ▶ Analyzed for VOCs and found TCE and 1,1-DCE above $^{GW}Soil_{Ing}$ with minor hits of TPH
- ▶ Additional analyses were also performed using SPLP on the sample(s) exhibiting the highest TCE & 1,1-DCE concentrations
- ▶ SPLP results show that 1,1-DCE was not detected above the $^{GW}GW_{Ing}$ PCL
- ▶ TCE was detected in a couple soil samples the highest being 0.63 mg/kg and the leachate at a concentration of 0.00152 milligrams per Liter (mg/L), [below the $^{GW}GW_{Ing}$ PCL]



Scenario 3 - Continued

Option B. SPLP Analysis

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- ▶ A representative groundwater sample was collected; Only TCE detected in groundwater at a concentration of 0.0034 mg/L, below the $^{GW}GW_{Ing}$ PCL of 0.005 mg/L
- ▶ The site passed the Tier 1 Eco Exclusion Checklist
- ▶ Submit a report of findings to the TCEQ

TRRP Applies? Yes ☐ No ☒



Example

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Clean-up in Joe's Back Yard



Scenario 3 – Example Combination of Options A & B

Area of soils impacted with Chemical X. PCLs: $\text{TotSoil}_{\text{Comb}} = 202 \text{ mg/kg}$, $\text{GWSoil}_{\text{Ing}} = 11 \text{ mg/kg}$, and $\text{GW}_{\text{Ing}} = 0.007 \text{ mg/L}$

- ▶ Soils exhibiting concentrations of Chemical X above $\text{TotSoil}_{\text{Comb}}$ PCL are excavated and disposed
- ▶ Area resampled to find highest remaining soil sample concentration to be at 15 mg/kg
- ▶ SPLP analyses performed on sample with highest remaining concentration. SPLP results = 0.004 mg/L
- ▶ A representative GW sample shows the concentration of Chemical X = 0.003 mg/L and no other detections



Scenario 3 – Example Combination of Options A & B - Continued

[PCLs: $\text{TotSoil}_{\text{Comb}} = 202 \text{ mg/kg}$, $\text{GWSoil}_{\text{Ing}} = 11 \text{ mg/kg}$, and $\text{GW}_{\text{Ing}} = 0.007 \text{ mg/L}$]

- Submit report documenting actions taken along with completed (and passed) Tier 1 Eco Checklist – justifying No Further Action

TRRP Applies? Yes ☐ No ☒

Note: the time constraints (within the 60 days) to perform excavation/additional excavation, resampling, SPLP analysis, and GW sampling



In Summary

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- ❖ Current document "Determining Which Releases are Subject to TRRP" (11/19/2010)
- ❖ NFA when COC concentrations less than or equal to MQL or background
- ❖ When soil samples concentrations exceed Bkg or MQL but below $^{GW}Soil_{Ing}$ action level - Provide a letter report with Tier 1 Eco Checklist to TCEQ
- ❖ When soil action level concentrations are greater than $^{GW}Soil_{Ing}$; options to perform excavation or SPLP but always need a GW sample - Provide a report of findings with Tier 1 Eco Checklist



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