Wisconsin
Department of Natural Resources

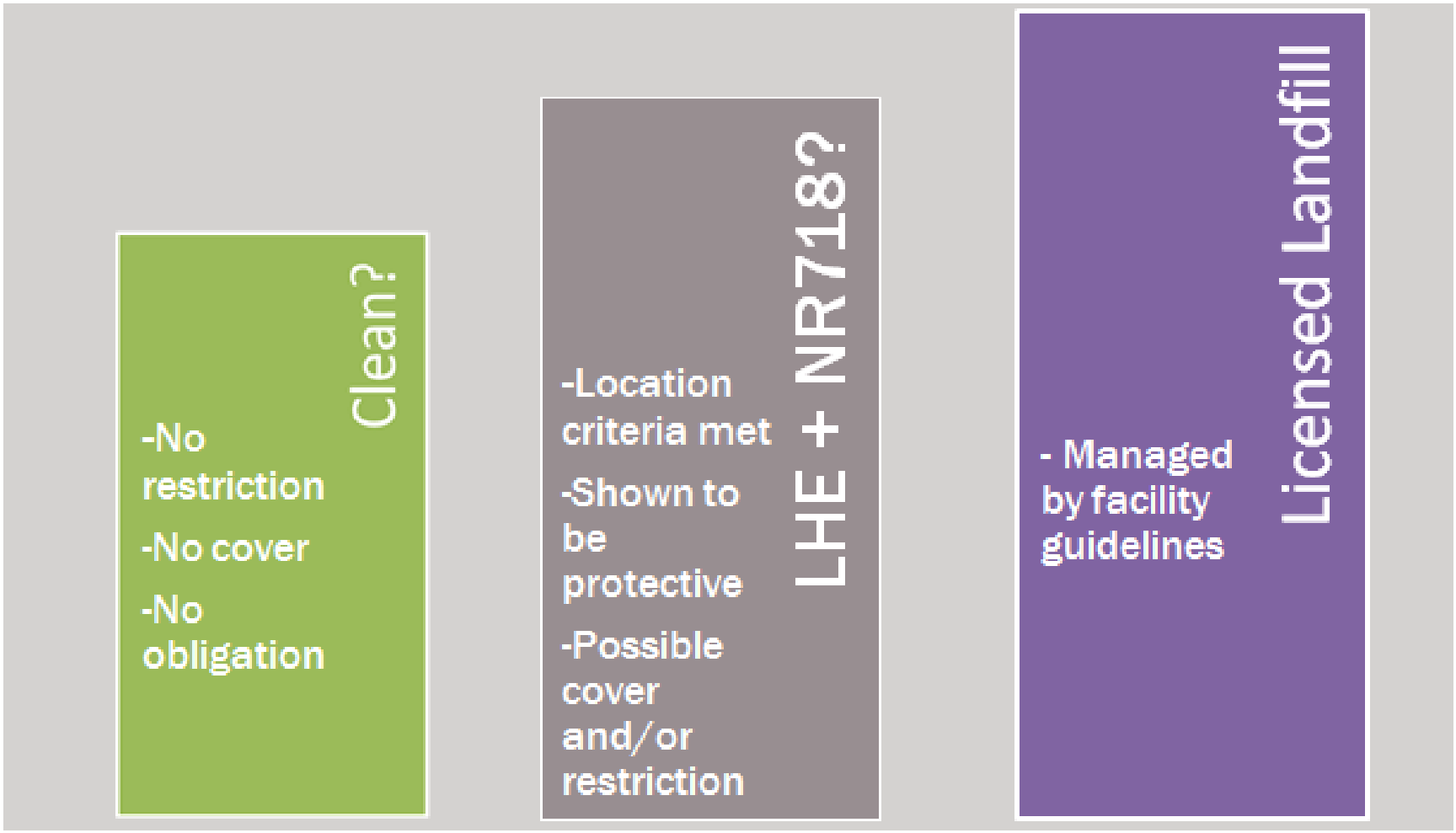
Contaminated Material Management External Advisory Group

April 4, 2017

Overview

- Guidance Status Update
- Changes to the RCL Calculator
  - New B(a)P RPFs
  - New Baseline Assumptions
  - Proposed PAH cumulative assessment
- PAH Background Study
- Soil Management Next Steps
  - Process Guidance

Memory Jogger



Guidance Status Update

1. NR 718 Guidance
2. NR 718 Exemption Request Format
3. Sample Results Notification
4. Immediate Action Exemption from Locational Criteria Request
5. Clean Soil Guidance

Guidance Document Status

1. NR 718 Exemption RR-060

NR 718 Exemption

Wisconsin DNR – NR 700 Process

Remediation and Redevelopment Program **March 2017**

Management of Contaminated Soil and Other Solid Wastes Wis. Admin. Code §§ NR 718.12 and NR 718.15

Purpose

This guidance is intended for use by responsible parties when excavating contaminated soil and/or other waste materials that may not warrant disposal at an operating, licensed landfill. This guidance describes several exemptions that may be available in such situations.

Background

Contaminated soil and other solid wastes that are generated as part of a *response action* under the state's clean-up rules may be eligible for an exemption from state solid waste laws in Wis. Stats. § 292 and Wis. Admin. Code §§ NR 500 to 538. The Wis. Admin. Code § NR 700 rule series governs the response to and cleanup of hazardous substance discharges and environmental pollution. These exemptions to solid waste management are granted under Wis. Admin. Code §§ NR 500.08(6), NR 718.12 and NR 718.15. See the "Quick Guide" in Appendix 1 for an overview.

Exemption Options – NR 718

- Limited to Response Action sites
- Limited to management of soil at the same or other site or facility
- Limited to management of other solid waste on source property only

Exemption Options – NR 718

- Immediate Action
  - Self Implementing
  - Includes movement of soil and other solid waste on source property and soil on another site or facility.
  - Limited to 100 cy of material
  - Levels of contaminants cannot require engineering controls.

Exemption Options – NR 718

- Interim or Remedial Actions
  - Requires pre approval
  - Requires information included within the “Recommended Exemption Request Format”
  - Levels of contamination can require engineering controls or other continuing obligations.

Exemption Options – NR 718

NR 718 Quick Guide: What Contaminated Soil or other Solid Waste Management Options are Available at Response Action Sites or Facilities?

This table is a general guide that describes what management/exemption options are available to responsible parties (RPs) and possibly others when managing contaminated soil or other solid waste (e.g., contaminated sediments, fill, foundry sand) excavated as a result of an immediate, interim or remedial response action taken under the Wis. Admin. § NR 700 rule series. This is an alternative approach to managing the material as a solid waste at an operating solid waste facility licensed to accept that waste.

Questions	NR 718.12(1) Contaminated Soil Exemption	NR 718.12(1) & (2) Contaminated Soil Exemption	NR 718.15 – on site replacement of solid waste other than soil
1. What types of NR 700 response actions are eligible for the exemptions?	• Immediate Actions - NR 708.05	• Interim Actions - NR 708.11 • Remedial Actions – NR 722 and 724	• Interim Actions - NR 708.11 • Remedial Actions – NR 722 and 724
2. Who may utilize the NR 718 exemptions?	• Responsible parties • Construction or utility projects[1]	• Responsible parties	• Responsible parties
3. Is Department pre-approval required to receive the NR 718 exemption and take action?	• No, but all criteria in NR 718.12(1) must be met	• Yes, pre-approval in writing • RP is required to provide DNR advance notice of 7 or 45 days, depending on situation • RP must wait for approval.	• Yes, pre-approval in writing • RP is required to provide DNR advance notice of 7 or 45 days, depending on situation • RP must wait for approval.

Guidance Document Status

2. NR 718 Exemption Request Format RR-072

NR 718 Recommended Exemption Request Format

Wisconsin DNR – NR 700 Process

Remediation and Redevelopment Program — March 2017

Recommended Format for Exemption Request Wis. Admin. Code § NR 718.12 or§ NR 718.15

Purpose

The purpose of this document is to provide a consistent format for consultants and responsible parties to demonstrate that the proposed management of solid waste material qualifies for a Wis. Admin. Code §§ NR 718.12 or NR 718.15 exemption and to request written approval of the exemption request. This document may be included as part of a Remedial Action Plan or Post Closure Modification Request, or can be submitted by itself depending on the activities conducted at the site. The use of this form is optional.

Introduction

Soil and other solid waste generated from a response action site as part of an interim or remedial action may be managed at a site or facility that is not an operating licensed landfill if a Wis. Admin. §§ NR 718.12 or NR 718.15 exemption is obtained from the Department of Natural Resources (DNR). The property where material will be managed would be exempted from the Waste and Materials Management Program requirements established in Wis. Stat. § 289 and Wis. Admin. §§ NR 500 to NR 538. An exemption through Wis. Admin. § NR 718.12 can be granted when soil is being managed as part of an interim action under Wis. Admin. § NR 708 or a remedial action under Wis. Admin. § NR 722. An exemption through Wis. Admin. § NR 718.15 can be granted when other waste material is managed as part of an interim or remedial action on the site from which it was generated. Managing material with either exemption requires prior written approval from the DNR.

Exemption Request Format

- Not a completely fillable form (yet).
  - Some parts filled out on the form:

Provide the following information for the owner of the receiving site or facility. If there is more than one property owner include the information requested below for each as a separate document and attach to this form.			
Property Owner Name(s)	**Company Name**		
Mailing Address	**City**	**State**	**ZIP Code**
Phone # (include area code)	**Email**		

Exemption Request Format

– Other parts provided as attachments:

Address the following items to describe the soil and/or non-soil waste material that will be managed under this plan and demonstrate that it has been adequately characterized. Attach your responses to these items at the end of this document.

A. Describe the material proposed to be managed, including its general makeup, physical characteristics, the homogeneity of the material, the proportion of soil to non-soil waste, and any other pertinent descriptors.

B. Total volume of contaminated soil and/or other solid waste to be managed (cubic yards):

If format is used, submit filled out form plus all attachments.

Exemption Request Format

- Format is Optional – but recommended:
  - Helps to ensure a complete submittal
  - Allows for streamlined review
  - Satisfies the requirement to notify receiving site property owners of continuing obligations

Exemption Request Format

- Includes the following Sections:
  1. General Information and Fees
  2. Property and Contact Information
  3. Waste Characterization
  4. Project Description/Soil Mgmt Plan
  5. Receiving Site or Facility Information
  6. Locational Criteria
  7. Add. Info for Non-Metallic Mine Sites
  8. Continuing Obligations at Receiving Site or Facility
  9. Figures – Attachments
  10. Additional Attachments
  11. Certification - Signatures

1. General Information and Fees

Identify the purpose of the exemption:

- ☐ Manage contaminated soil on the same response action site from which it was generated (§ NR 718.12).
- ☐ Manage contaminated soil at a site or facility that is different from the response action site from which it was generated (§ NR 718.12).
- ☐ Manage other solid waste at the same site from which it was generated (§ NR 718.15).

1. General Information and Fees

NR 749 Fees for Requesting Wis. Admin. Code §§ NR 718.12 Soil or NR 718.15 Exemption

Soil or Waste Managed on the Generating Property			
Action	**Action Fee**	**GIS Fee**	**On-Site MGMT Fee**
Interim Actions per NR 708.11, with SMP and CO applied at other site/facility	$700	No fee	☐ $700
Remedial Action Plan approval, with SMP, without residual soil CO	$1050	No fee	☐ $1050
Remedial Action Plan approval, with SMP, with residual soil CO	$1050	$300	☐ $1350
SMP submitted separately from a RAP or post closure modification, without residual soil CO	$700	No fee	☐ $700

2. Property and Contact Information

Section 2 –Property and Contact Information

Fill in all applicable portions of this section.

Information About The Site Where Material Is Proposed to be Excavated – Complete all applicable boxes	
BRRTS No.	BRRTS Activity (Site) Name
Response Action Site Address	VPLE No.
City	Parcel ID No.
State	FID No.
County	Zip Code
WTM Coordinates	WTM Coordinates Represent

2. Property and Contact Information

Responsible Party Information			
Responsible Party (RP) Name(s)	Company Name		
Mailing Address	City	State	ZIP Code
Phone # (include area code)	Email		

Property Owner Information, if different from Responsible Party			
Responsible Party (RP) Name(s)	Company Name		
Mailing Address	City	State	ZIP Code
Phone # (include area code)	Email		

2. Property and Contact Information

Requestor Information				
Last Name	First	Organization/Business Name		
Mailing Address		City	State	ZIP Code
Phone # (include area code)		Email		

Check the box that describes the requestor's relationship to the generating property:

- ☐ Is the property owner
- ☐ Is renting or leasing the property
- ☐ Is developing the property
- ☐ Other, describe relationship:

Contact Information For Questions About this Request		
Last Name	First	Organization/Business Name
		Relationship to Requestor (Same, Consultant, Developer, Etc.):

2. Property and Contact Information

Information About The Site or Facility Where Soil Will Be Disposed, if Different Than The Site or Facility From Which it Was Generated	
☐ Select if Same as Generating Property (and skip remainder of section)	
BRRTS No.	**BRRTS Activity (Site) Name**
Response Action Site Address	**VPLE No.**
City	**Parcel ID No.**

Receiving Property Owner Information			
Provide the following information for the owner of the receiving site or facility. If there is more than one property owner include the information requested below for each as a separate document and attach to this form.			
Responsible Party (RP) Name(s)	**Company Name**		
Mailing Address	**City**	**State**	**ZIP Code**

3. Waste Characterization

- What is it (soil or other waste)
- How much is there
- What are the contaminants
- How was it characterized
  - Present the sampling data, justify that it is sufficient

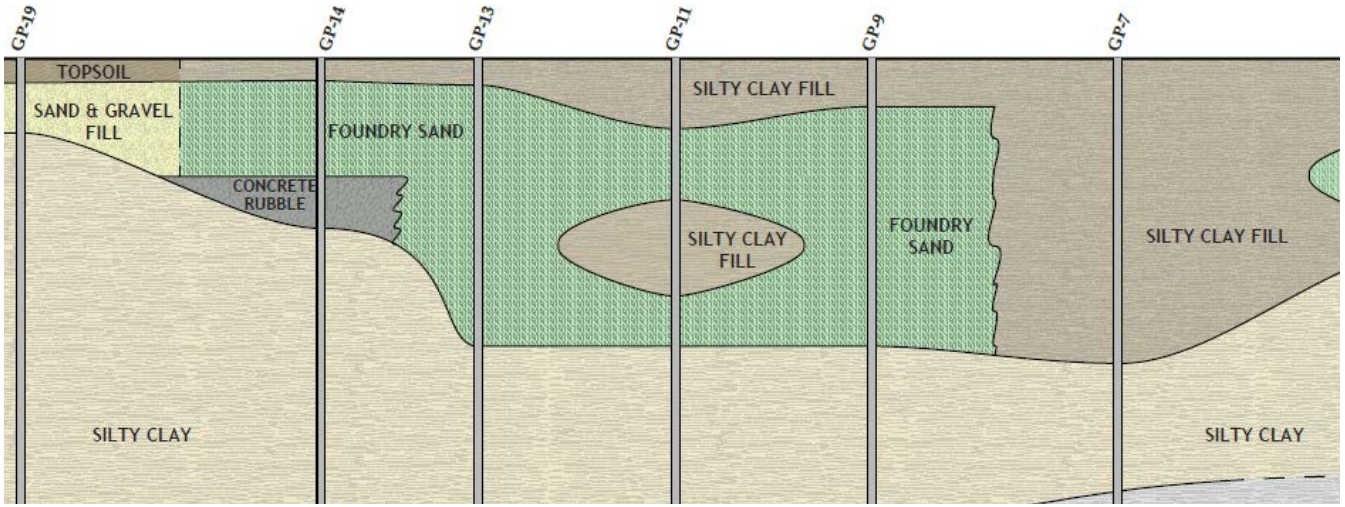
4. Project Description/Soil Mgmt Plan

Where is it coming from, where is it going

- Schedule
- How will activities minimize environmental impacts

5. Receiving Site or Facility Information

- Receiving site use
- Geology/hydrogeology
- Environmentally sensitive areas
- Other regulatory restrictions (storm water)



5. Receiving Site or Facility Information

Additional documentation for off site relocation:

- Waste characteristics and quantities.
- The geology and hydrogeology of the area.
- The unavailability of other environmentally suitable alternatives.
- Compliance with other state and federal regulations.
- No threat to public health, safety, or welfare or the environment.

6. Locational Criteria

Location Standards	
Check any criteria that are not met for proposed material placement:	
	Within a floodplain.
	Within 100 feet of any wetland or critical habitat area.
	Within 300 feet of any navigable river, stream, lake, pond, or flowage.
	Within 100 feet of any on-site water supply well or 300 feet of any off-site water supply well.
	Within 3 feet of the high groundwater level.
	At a depth greater than the depth of the original excavation from which the contaminated soil was removed.

- An exemption to the criteria may be requested

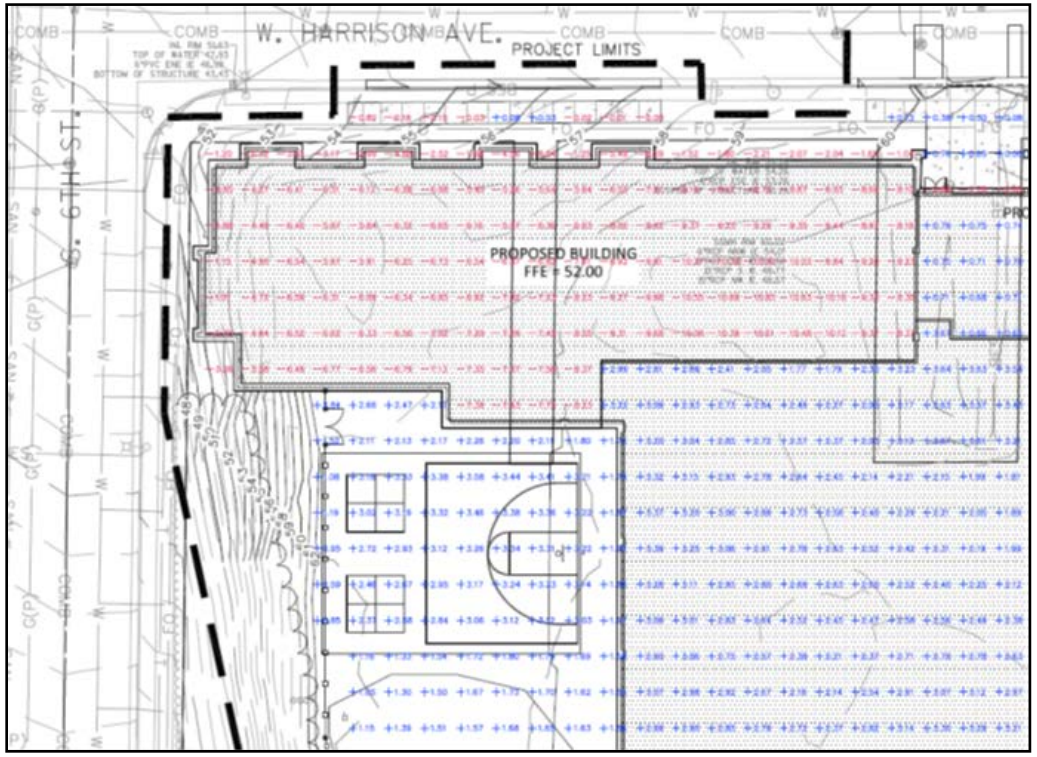
7. Non-Metallic Mine Receiving Sites

- Depth of natural groundwater level
- Copy of the reclamation plan that allows low-level contaminated material
- Capping requirements/ restrictions

8. Continuing Obligations at Receiving Site

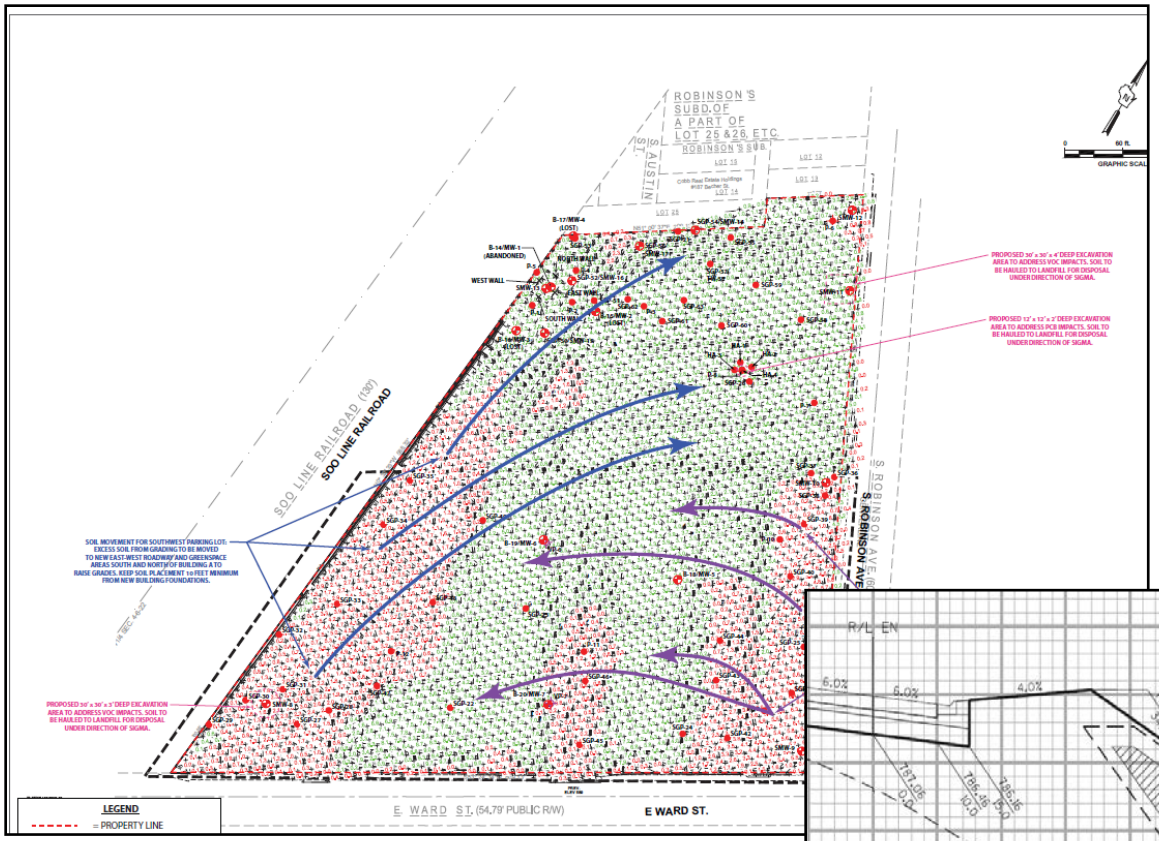
- Residual Soil Contamination
- Maintenance of a Cover
- Industrial Soil Standards
- Future Actions to Address Vapor
- Site Specific Condition

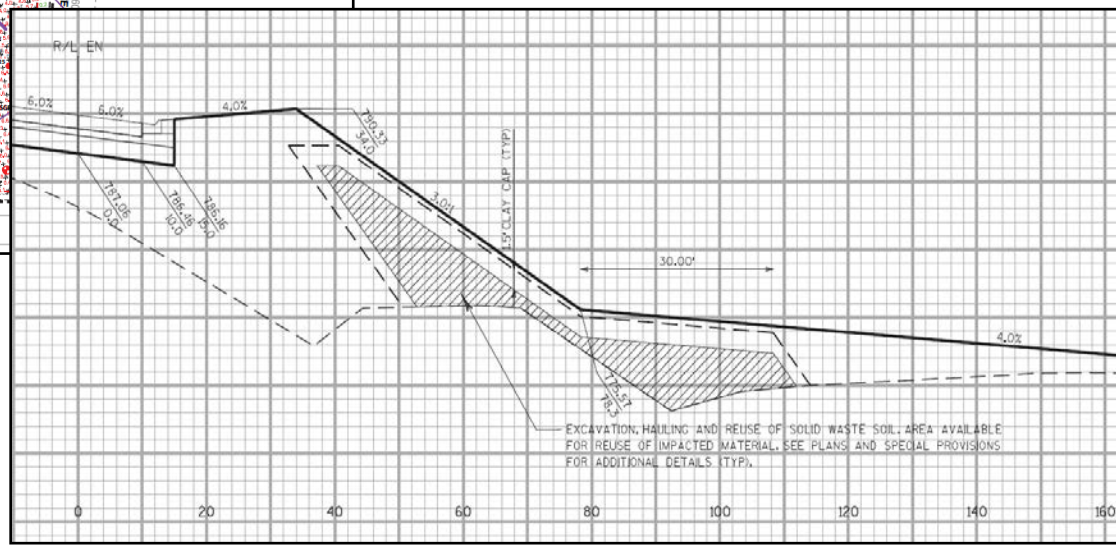
9. Figures



- Cut-Fill Maps
- Cross Sections
- Groundwater Contour Maps
- Sample Location Maps

9. Figures


ROBINSON'S SUBD.OF A PART OF LOT 25 & 26 ETC
ROBINSON'S SUB.
S AUSTIN
SOO LINE RAILROAD (100')
SOO LINE RAIL ROAD
S ROBINSON AVE
WEST WALL
SOUTH WALL
PROPOSED 30' x 30' x 4' DEEP EXCAVATION AREA TO ADDRESS VOC IMPACTS. SOIL TO BE HAULED TO LANDFILL FOR DISPOSAL UNDER DIRECTION OF SIGMA.
PROPOSED 12' x 12' x 2' DEEP EXCAVATION AREA TO ADDRESS PCB IMPACTS. SOIL TO BE HAULED TO LANDFILL FOR DISPOSAL UNDER DIRECTION OF SIGMA.
SOIL MOVEMENT FOR SOUTHWEST PARKING LOT: EXCESS SOIL FROM GRADING TO BE MOVED TO NEW EAST-WEST ROADWAY AND GREENSPACE AREAS SOUTH AND NORTH OF BUILDING A TO RAISE GRADES. KEEP SOIL PLACEMENT 10 FEET MINIMUM FROM NEW BUILDING FOUNDATIONS.
PROPOSED 30' x 30' x 3' DEEP EXCAVATION AREA TO ADDRESS VOC IMPACTS. SOIL TO BE HAULED TO LANDFILL FOR DISPOSAL UNDER DIRECTION OF SIGMA.
LEGEND
= PROPERTY LINE
E WARD ST. (54.79' PUBLIC R/W)
E WARD ST.


R/L EN
6.0%
6.0%
4.0%
790.37
34.0
781.06
0.0
785.46
10.0
785.46
25.0
3.0%
2.5' CLAY CAP (TYP)
30.00'
4.0%
775.57
19.3
EXCAVATION, HAULING AND REUSE OF SOLID WASTE SOIL. AREA AVAILABLE FOR REUSE OF IMPACTED MATERIAL, SEE PLANS AND SPECIAL PROVISIONS FOR ADDITIONAL DETAILS (TYP).
0
20
40
60
80
100
120
140
160

10. Additional Attachments

- Maintenance Plan
- Deed for the Receiving Property
- Analytical Table
- Lab Data

			EXCAVATE MATERIAL - 7400 CUBIC YARDS TO BE EXCAVATED						
Map Sample ID	Non-Industrial Direct Contact RCL (mg/kg)	Protection of Groundwater RCL (mg/kg)	KB-38	KB-40	KB-41	KB-47	KB-52	KB-53	KB-54
Sample ID			KB-38	KB-40	KB-41	KB-47	KB-52	KB-53	KB-54
Site Address			2636-2668 S. 5th St	2620 S. 5th St	2620 S. 5th St	2607 S. 5th St	2607 S. 5th St	2607 S. 5th St	2607 S. 5th St
Date Collected			3/29/2016	3/25/2016	3/25/2016	3/29/2016	3/29/2016	3/29/2016	3/29/2016
Depth (feet bgs)			4.5-6.5	2-4	2-4	1-3	4-6	1-4	1-4
Saturated(s)/Unsaturated(u)			U	U	U	U	U	U	U
Detected VOCs (mg/kg)									
Benzene	1.49	0.0051	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
n-Butylbenzene	108	--	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
sec-Butylbenzene	145	--	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Carbon Tetrachloride	0.854	0.0039	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025

11. Certification Statements

Professional Engineer			
Last Name	First Name		
Mailing Address	City	State	ZIP Code
Phone # (include area code)	Email		
It is my professional opinion that the proposed soil management activity will not cause environmental pollution nor cause any other significant risk to public health, safely or welfare."			
Signature	Date	Wisconsin Registration Number	

Property Owner Acknowledgement

- Follow the conditions and limitations required by law and specified in the exemption.
- Certify soil managed at a “site” or “facility”.
- Manage material in future as solid waste with DNR approval.
- Understand this exemption will be tracked in the BRRTS.
- Inspect and maintain engineering controls over the contaminated material per any continuing obligations.
- Be subject to inspection by the department.
- Understand conditions on property may be subject to Wis. Stats. Chapter 709, Disclosures by Owners of Real Estate.
- Confirm legal description for properties where material will be managed are included with this submittal.

Property Owner Acknowledgement

Property Owner Acknowledgement

Signatures

OWNER(S) OF PROPERTY WHERE MATERIAL IS PLACED		
Print Name	**Signature**	**Date**
Print Name	**Signature**	**Date**
Print Name	**Signature**	**Date**
Print Name	**Signature**	**Date**
I understand that by signing this application I certify that I will follow the conditions and limitations required by law and specified in the exemption issued to me as owner of the site or facility that will receive the		

Tracking in BRRTS

- Continuing Obligations will be imposed on receiving sites where soil placement requires long term stewardship.
- Includes listing on the DNR Database.

Tracking in BRRTS

- Contaminated Material Management sites - receiving sites in which a property owner has agreed to accept contaminated soil from “another property” under an NR718 approval process.
- Linked on BRRTS to show relationship to site where material originated.

Tracking in BRRTS

- Documents including the exemption request and the approval letter will be uploaded to BRRTS.

Fees

- WMM Low Hazard Exemption - $550
- NR 718 Exemption –
  - Immediate Action with NFA -$350
  - Interim Action - $700
  - Remedial Action - $1050
  - Post Closure Modification - $1050
  - PLUS GIS fees - $300/$350
- On-site and off-site fees apply

Fees

On-Site Management of Material

NR 749 Fees for Requesting Wis. Admin. Code §§ NR 718.12 Soil or NR 718.15 Exemption

Soil or Waste Managed on the Generating Property			
Action	**Action Fee**	**GIS Fee**	**On-Site MGMT Fee**
Interim Actions per NR 708.11, with SMP and CO applied at other site/facility	$700	No fee	☐ **$700**
Remedial Action Plan approval, with SMP, without residual soil CO	$1050	No fee	☐ **$1050**
Remedial Action Plan approval, with SMP, with residual soil CO	$1050	$300	☐ **$1350**
SMP submitted separately from a RAP or post closure modification, without residual soil CO	$700	No fee	☐ **$700**
SMP submitted separately from a RAP or post closure modification, with residual soil CO	$700	$300	☐ **$1000**
Closed Sites: Post-closure action, with SMP, without residual soil CO	$1050	No fee	☐ **$1000**
Closed Sites: Post-closure action, with SMP, with residual soil CO	$1050	$300	☐ **$1350**

Fees

Off-Site Management of Material

Soil Managed on a Site or Facility other than the Generating Property			
Action	**Action Fee**	**GIS Fee**	**Off-Site MGMT Fee**
Interim Actions per NR 708.11, with SMP and CO applied at other site/facility	$700	$350	☐ **$1050**
Interim Actions per NR 708.11, with SMP and no CO applied at other site/facility	$700	No fee	☐ **$700**
All other Actions (Remedial actions, post closure modifications, etc.) with residual soil CO	$700	$300	☐ **$1000**
All other Actions (Remedial actions, post closure modifications, etc.) with no residual soil CO	$700	No fee	☐ **$700**
Total of On-Site Management Fee and Off-Site Management Fee			**$**

Other: If the request does not conform to one of the options above, summarize the request below and the fee that is being paid:

Who Can Help?
Regional NR 718 Support

Statewide: Paul Grittner, Paul.Grittner@wisconsin.gov, (608) 263-8541
Northeast: Kristen Dufresne, Kristen.dufresne@wisconsin.gov, (920) 662-5443
Northern: Chris Saari, Chris.Saari@wisconsin.gov, (715) 685 - 2920
South Central: Mike Schmoller, Michael.Schmoller@wisconsin.gov, (608) 275-3303
Southeast: Nancy Ryan, Nancy.Ryan@wisconsin.gov, (414) 263 - 8533
Linda Michalets, Linda.Michalets@wisconsin.gov, (414) 263-8757
West Central: Matt Thompson, Matthew.Thompson@wisconsin.gov, (715) 839-3750

Guidance Document Status

3. Sample Results Notification

RR-071

Lab Data Reporting Form

Wisconsin DNR – NR 700 Process

Remediation and Redevelopment Program **March 2017**

NR 718.12 Sample Results Notification

Purpose
The purpose of this document is to comply with the requirements of Wis. Admin. Code § NR 718.12 (1)(e)(4).

Introduction

This document may be used to comply with the requirements of Wis. Admin. Code § NR 718.12 (1)(e)(4). The rule requires that responsible parties report to the Department of Natural Resources (DNR) analytical results for samples collected to characterize soil that will be managed under a Wis. Admin. Code § NR 718.12 exemption. Analytical results must be reported to the DNR in writing within 10 business days after receiving the sampling results.

Document Instructions

Complete and submit this form, along with laboratory data, to the appropriate DNR project manager. If you do not know who the project manager is, this documentation can be sent to the Environmental Program Associate in the appropriate region. A list of DNR EPA's can be found here: http://dnr.wi.gov/topic/Brownfields/Contact.html.

Site Information Where Material Is Proposed to be Excavated			
Site Name	**FID #**	**BRRTS #**	
Address	**City**	**State**	**ZIP Code**

Guidance Document Status

4. Immediate Action Exemption from Locational Criteria Request

RR-073

Locational Criteria Exemption

Wisconsin DNR – NR 700 Process

Remediation and Redevelopment Program **March 2017**

Request for Exemption from Location Criteria of NR 718.12(1)(c) for an Managing Soil as an Immediate Action

Purpose

The purpose of this document is to provide a consistent format for requesting an exemption from Wis. Admin. Code§ NR 718.12(1)(c) locational location criteria. If the location criteria will not be met, the person conducting the immediate action may request a written exemption from the DNR from these requirements by demonstrating that the proposed activities will not cause a threat to public health, safety, welfare and the environment.

Introduction

Contaminated soil at a site or facility excavated or otherwise managed as part of an immediate action may be exempted from the Soil Waste Rules in Wis. Stat. § 289 and Wis. Admin. §§ NR 500 to NR 538 by Wis. Admin. § NR 718.12(1) if soil contaminant concentrations soil are less than Wis. Admin. Code § NR 720 Residual Contaminant Levels. Management as an immediate action is generally self-implementing and does not require prior approval from the Department of Natural Resources (DNR) if the requirements of Wis. Admin. Code § NR 718.12(1) are met. This includes placing excavated soil at a site or facility that meets the location criteria specified in Wis. Admin. Code § NR 718.12 (1) (c).

Document Instructions

Complete all sections of this document as instructed below. Some portions of the document may be filled in directly as indicated, other

Locational Criteria Exemption

Location Standards	
Check any criteria that are not met for proposed material placement:	
	Within a floodplain.
	Within 100 feet of any wetland or critical habitat area.
	Within 300 feet of any navigable river, stream, lake, pond, or flowage.
	Within 100 feet of any on-site water supply well or 300 feet of any off-site water supply well.
	Within 3 feet of the high groundwater level.
	At a depth greater than the depth of the original excavation from which the contaminated soil was removed.

Maintenance Plan Template

- Under NR 718, if a cap is required a Maintenance Plan is also required.
- Maintenance Plan Template included as Attachment D, parts D.1. – D. 5 of Form 4400-202 – Closure Form
- Site can be audited in the future to ensure maintenance is conducted.

Guidance Document Status

5. Waste Determination and Clean Soil Guidance WA-1820

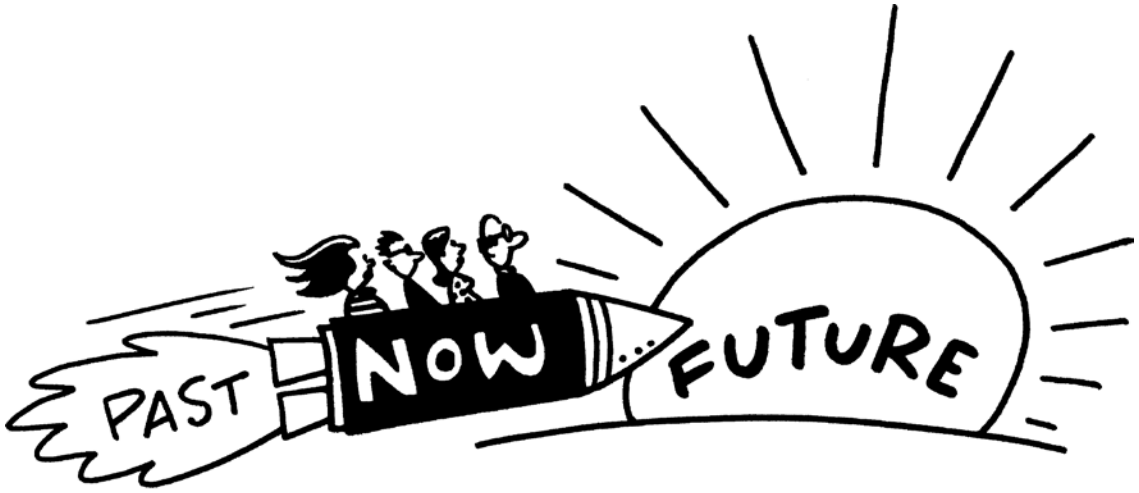
Clean Soil Defined

Wisconsin Background Threshold Values (BTVs), based on total parameter value analysis				
Parameter	**mg/kg**		**Parameter**	**mg/kg**
Aluminum (Al)	29,000		Iron (Fe)	34,000
Arsenic (As)	8		Lead (Pb)	52
Barium (Ba)	360		Magnesium (Mg)	8,300
Cadmium (Cd)	1		Manganese (Mn)	2,900
Calcium (Ca)	15,000		Nickel (Ni)	31
Chromium (Cr), Total	44		Strontium (Sr)	55
Cobalt (Co)	22		Vanadium (V)	85
Copper (Cu)	35		Zinc (Zn)	150

Background threshold values are non-outlier parameter maximum levels in Wisconsin surface soils from the USGS Report “Distribution and Variation of Arsenic in Wisconsin Surface Soils, With Data on Other Trace Elements” at: *http://pubs.usgs.gov/sir/2011/5202*.

What's Next?

- PAH Reassessment
  - Changes to the RCL Calculator
- PAH Pathway Assessment Form
- PAH Background Study
- Soil Management Next Steps
  - Process Guidance



PAH Reassessment

1. New technical information from EPA.
2. Cumulative assessment based on review by DHS.

First Deliverable: RCL Spreadsheet Changes

NEW TECHNICAL INFORMATION FROM EPA

1. NEW EPA Information

- PAH driver in most cleanups is benzo[a]pyrene (BaP).
- EPA lowered toxicity level for BaP.
- Changes made to DNR RCL Spreadsheet.
- B(a)P contaminant cleanup levels are less stringent, but protective.

1. New EPA Information

- DNR non-industrial direct contact RCL will increase from **15 ppb** to **115 ppb**.
- DNR industrial direct contact RCL will increase from **211** to **2,110** ppb.
- DNR groundwater protection RCL will not change.

1. NEW EPA INFORMATION

Exposure Assumptions

1. New EPA Information

- Exposure assumptions changed.
  - Standard person was 70kg, now 80kg
  - Larger people = More surface area
  - Changes residences more frequently
- Will affect all compounds on spreadsheet
- Results in less than 10% difference in calculated RCL values

PAH REASSESSMENT BY DHS

Second Deliverable: Risk Based Option for cPAHs

2. New Information from DHS

At DNR's request, DHS conducted:

- A reassessment of risk associated with carcinogenic PAHs (cPAHs).
- An evaluation of DNR's process for calculating cleanup standards for cPAHs in soil.

2. New Information from DHS

DHS determined cPAHs:

- Are always found as a mixture of cPAHs, never independently.
- Toxicologically, cPAHs act in an identical manner on humans.

DHS concludes it is appropriate to assess cPAHs on a cumulative basis.

2. New Information from DHS

DNR's Current PAH Assessment Criteria

NR720.12(1) target excess cancer risk thresholds:

1X10-6 for individual compounds,
and
1X10-5 for cumulative risk

2. New Information from DHS

- Risk-based approach allowed under NR 722.11(1)(b) when attaining compliance with the RCLs in NR 720 is not practicable.
- Proposed Approach:
  - Allow for cumulative assessment of 7 cPAHs using a modified RCL spreadsheet.
  - Develop cumulative cPAH number that is less stringent than individual RCLs, but still protective.

PAH Cancer Risk – cPAH Compounds

- Benzo(a)pyrene
- Dibenz(a,h)anthracene
- Benz(a)anthracene
- Benzo(b)fluoranthene
- Ideno(1,2,3-cd)pyrene
- Benzo(k)fluoranthene
- Chrysene
- Naphthalene
- 1-methylnaphthalene

cPAHs

PAH Cancer Risk – cPAH Compounds

- Benzo(a)pyrene
- Dibenz(a,h)anthracene
- Benz(a)anthracene
- Benzo(b)fluoranthene
- Ideno(1,2,3-cd)pyrene
- Benzo(k)fluoranthene
- Chrysene
- Naphthalene
- 1-methylnaphthalene

cPAHs
Cumulative Risk

cPAHs
Individual Basis

PAH Cancer Risk

- Cancer Risk for Benzo(a)pyrene = 

PAH Cancer Risk

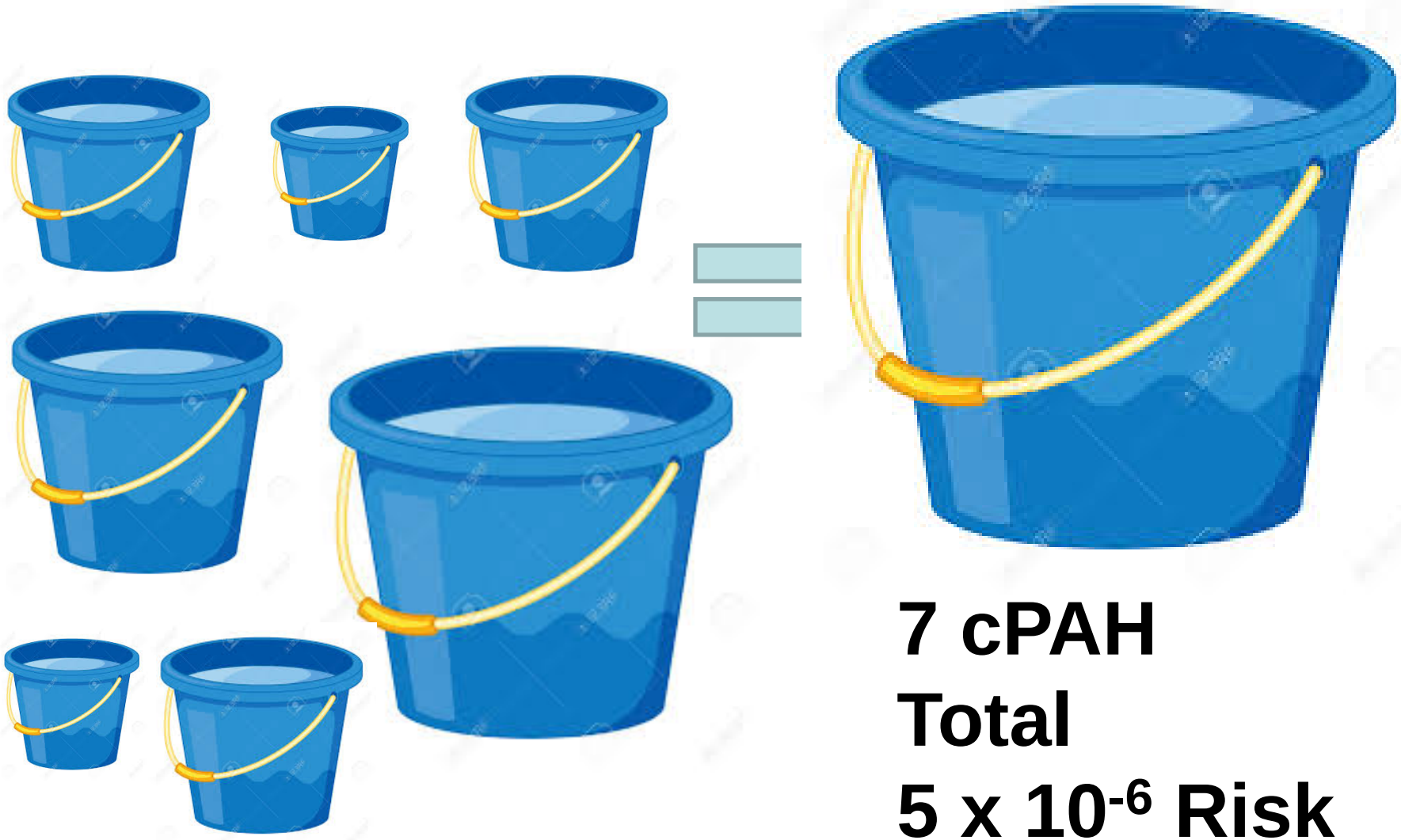
- Benzo(a)pyrene =
- Dibenz(a,h)anthracene =
- Benz(a)anthracene =
- Benzo(b)fluoranthene =
- Ideno(1,2,3-cd)pyrene =
- Benzo(k)fluoranthene =
- Chrysene =







cPAH Cancer Risk



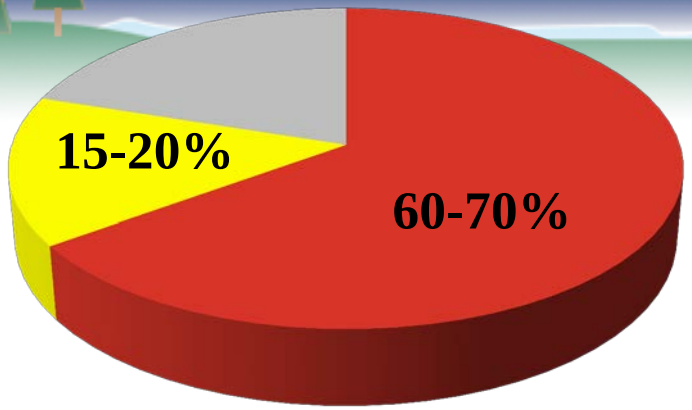
7 cPAH
Total
5 x 10^{-6} Risk

cPAH Cancer Risk

Why use only half of the 1 x 10-5 cumulative excess cancer risk at this time?

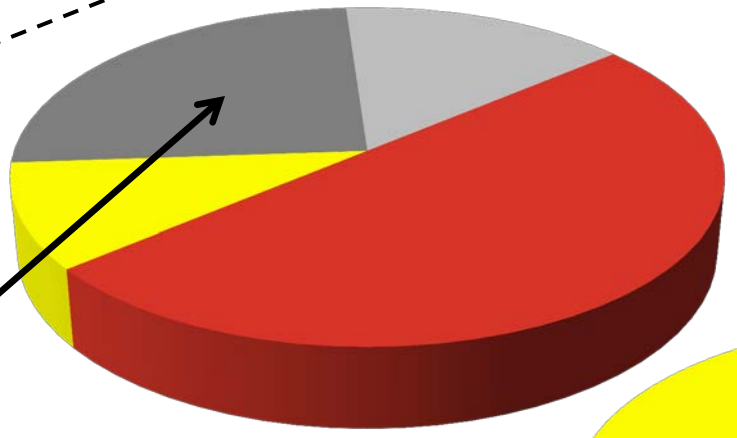
- Only 7 cPAHs included now.
- More potent cPAHs known.
- Additional potent compounds reduces “effective B(a)p concentration” within cumulative total.
- Half the cumulative risk “bucket” held in reserve:
  - for future compounds
  - changes in risk of current compounds

Cumulative Risk "Bucket"

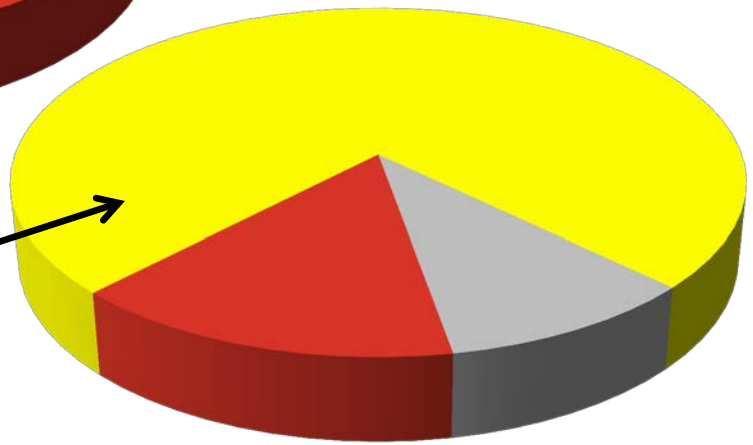


Current Cumulative cPAH Risk

Example Future Effects

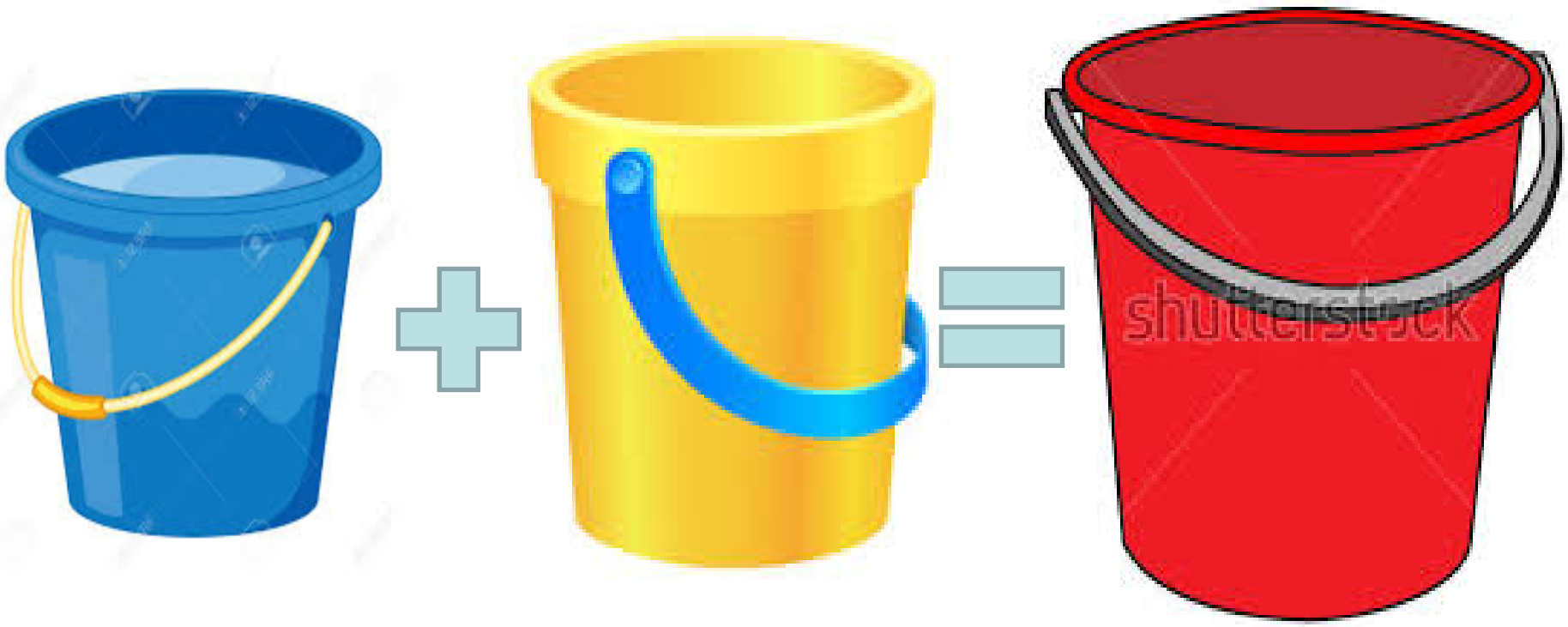


Add Potent, Not Previously Assessed cPAH



Increased relative potency of Db(ah)a

Total Cancer Risk



7 cPAHs

Non “7 cPAH” Carcinogens

Total Carcinogens

Total Cancer Risk

Total Carcinogens = 1×10^{-5}

Evaluating New Approach

What will not be affected:

- Non-cancer risk summation
- Industrial Direct Contact RCLs
- Groundwater pathway RCLs
- Total cumulative risk for all carcinogenic compounds

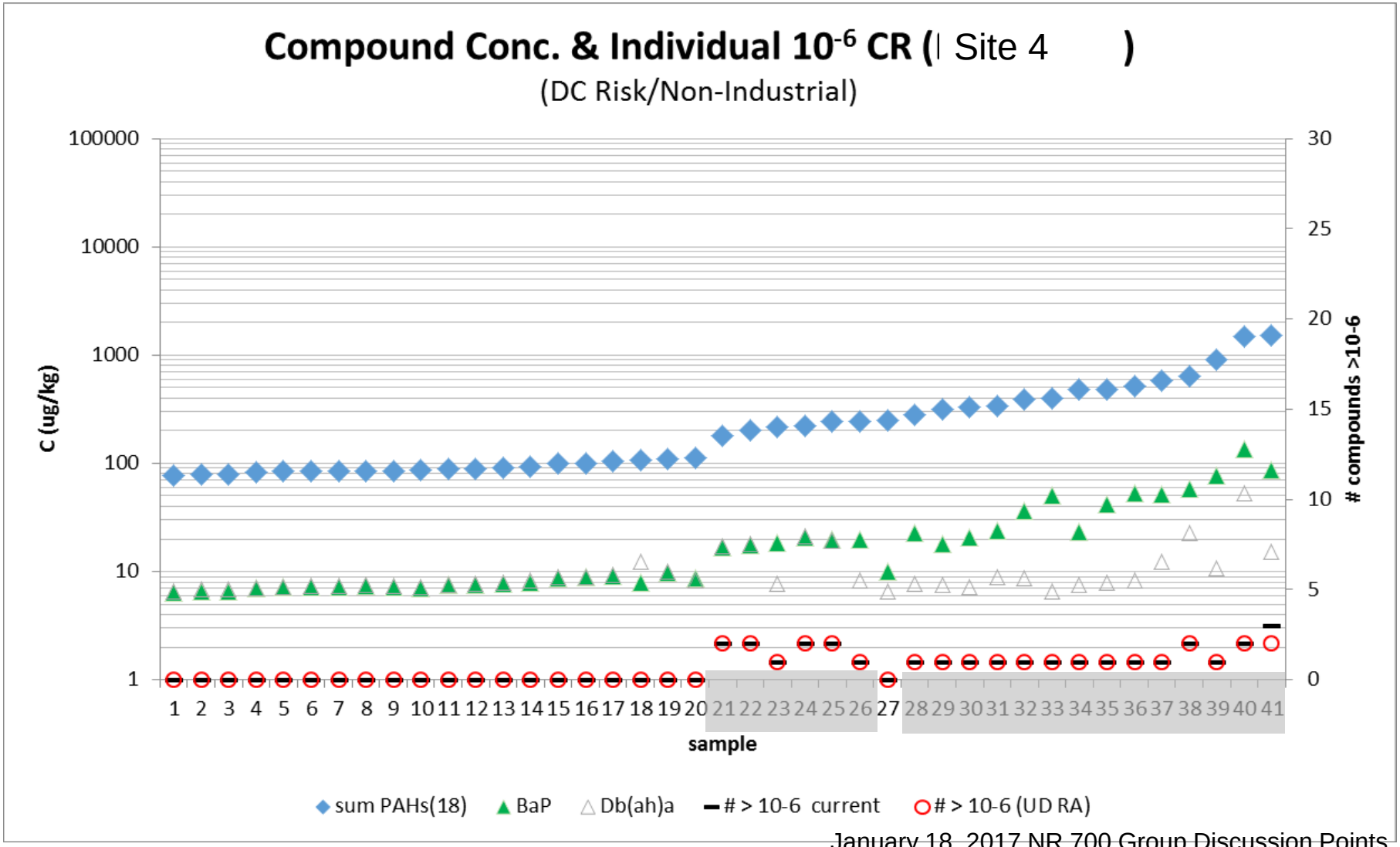
Evaluating New Approach

Test driving the cumulative approach:

- Evaluated 8 key sites with cPAH data.
- Significant effect on sites with widespread, low-level PAH concentrations.
- Minimal effect on sites with contamination from a point source spill or discharge.

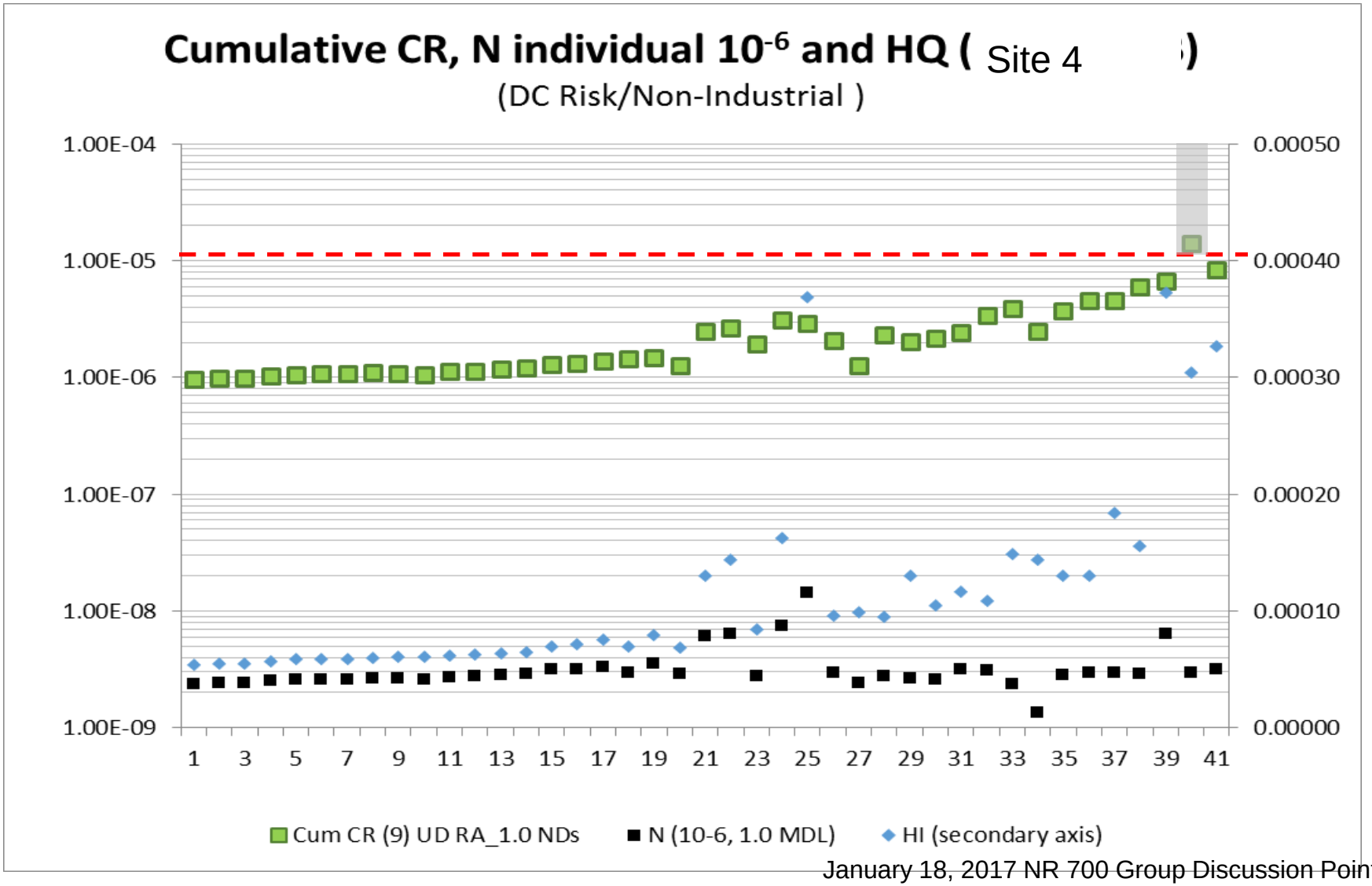
RCL Exceedances – Current Calculator

- One PAH compound will trigger – horizontal black dash (i.e., grey shading)
- 49% of samples exceed current 10^{-6} individual compound assessment
- Red circles are 10^{-6} exceedance using updated risk exposures



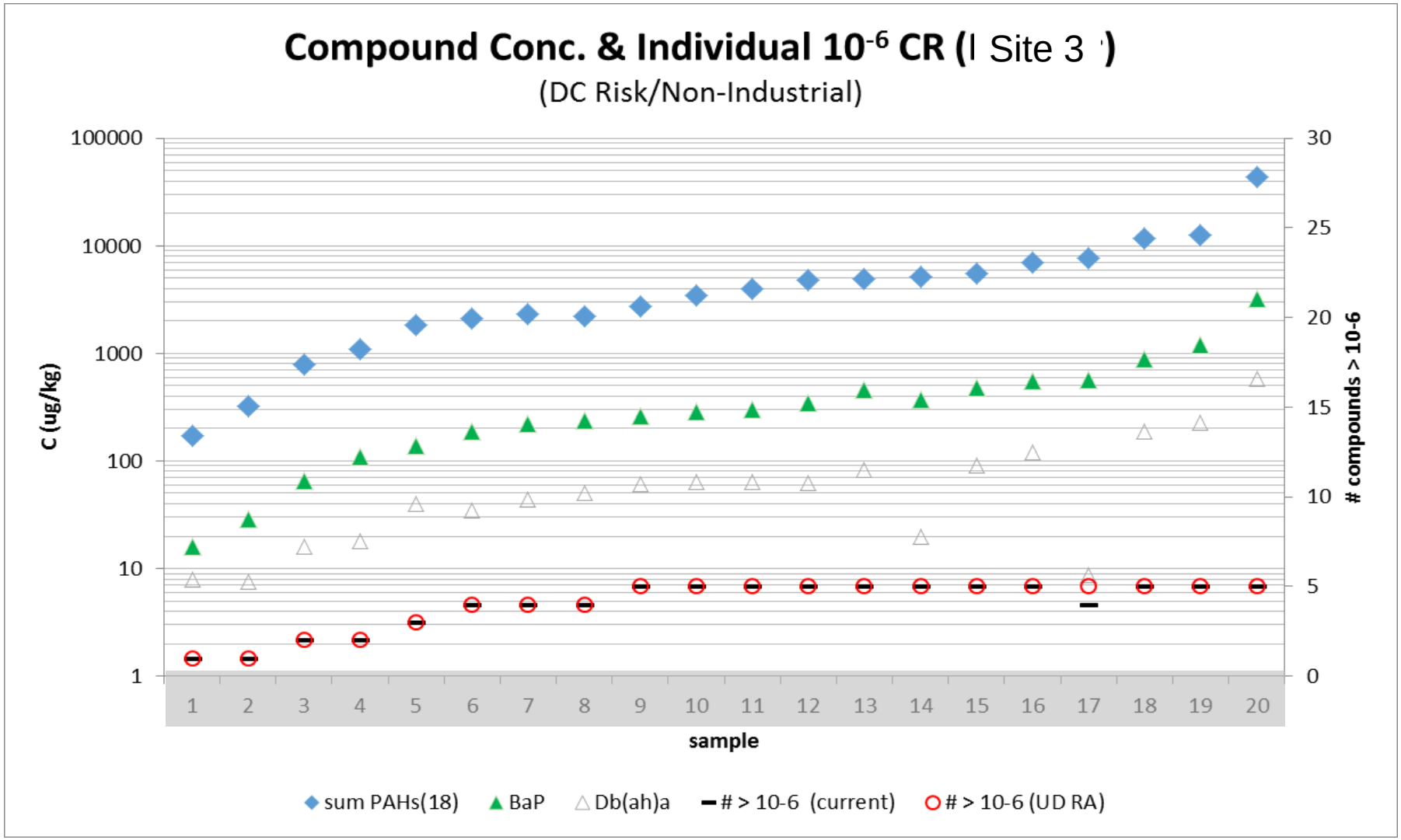
RCL Exceedances Using 10^{-5} Cumulative Exclusively

- 2% of samples now exceed (gray shading)
- Individual 10^{-6} threshold for Naphthalene shows little risk contribution
- Hazard Index insignificant



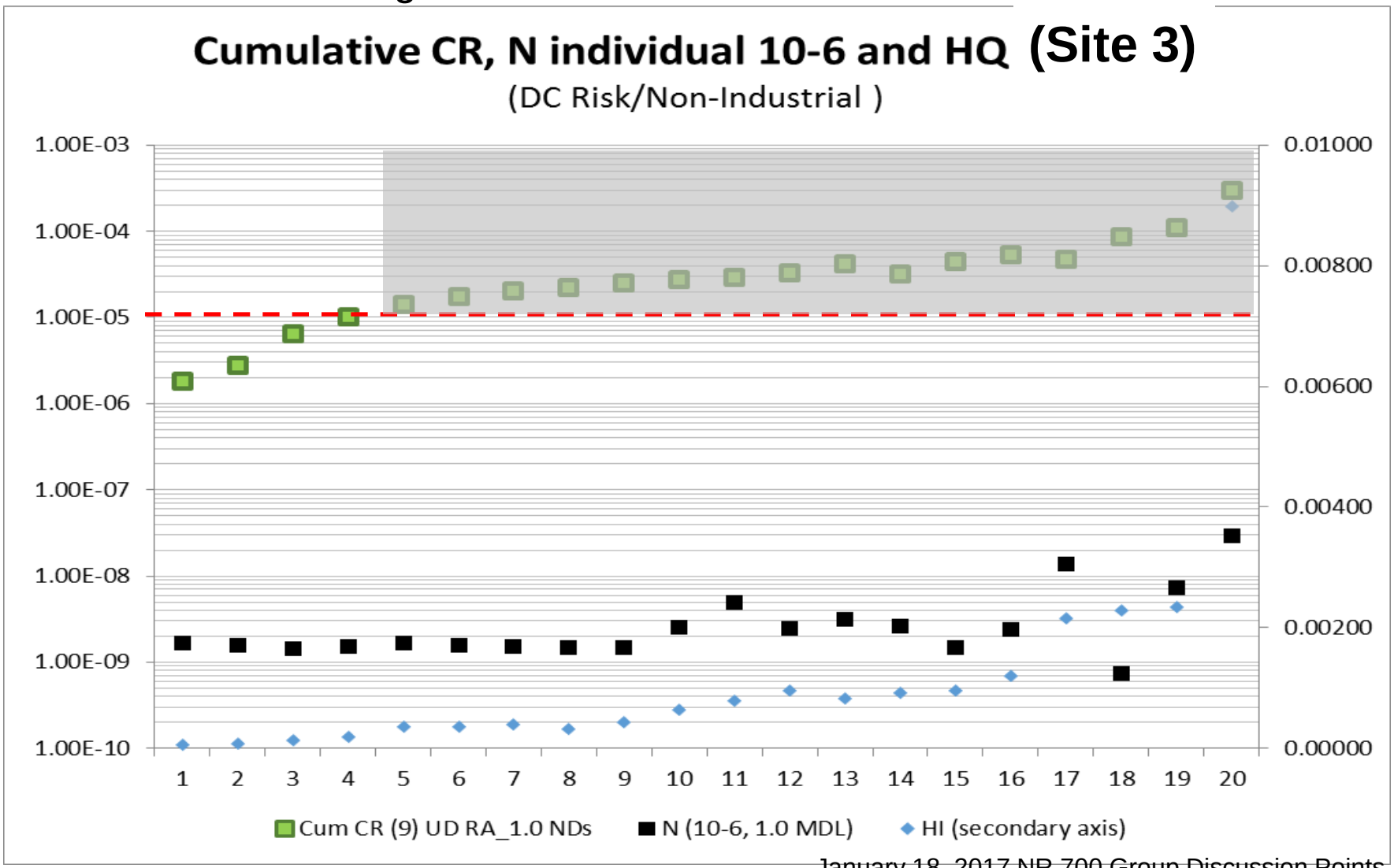
RCL Exceedances – Current Calculator

- One PAH compound will trigger – horizontal black dash (i.e., grey shading)
- 100% of samples exceed current 10^{-6} assessment
- Red circles are 10^{-6} exceedance using updated risk exposures

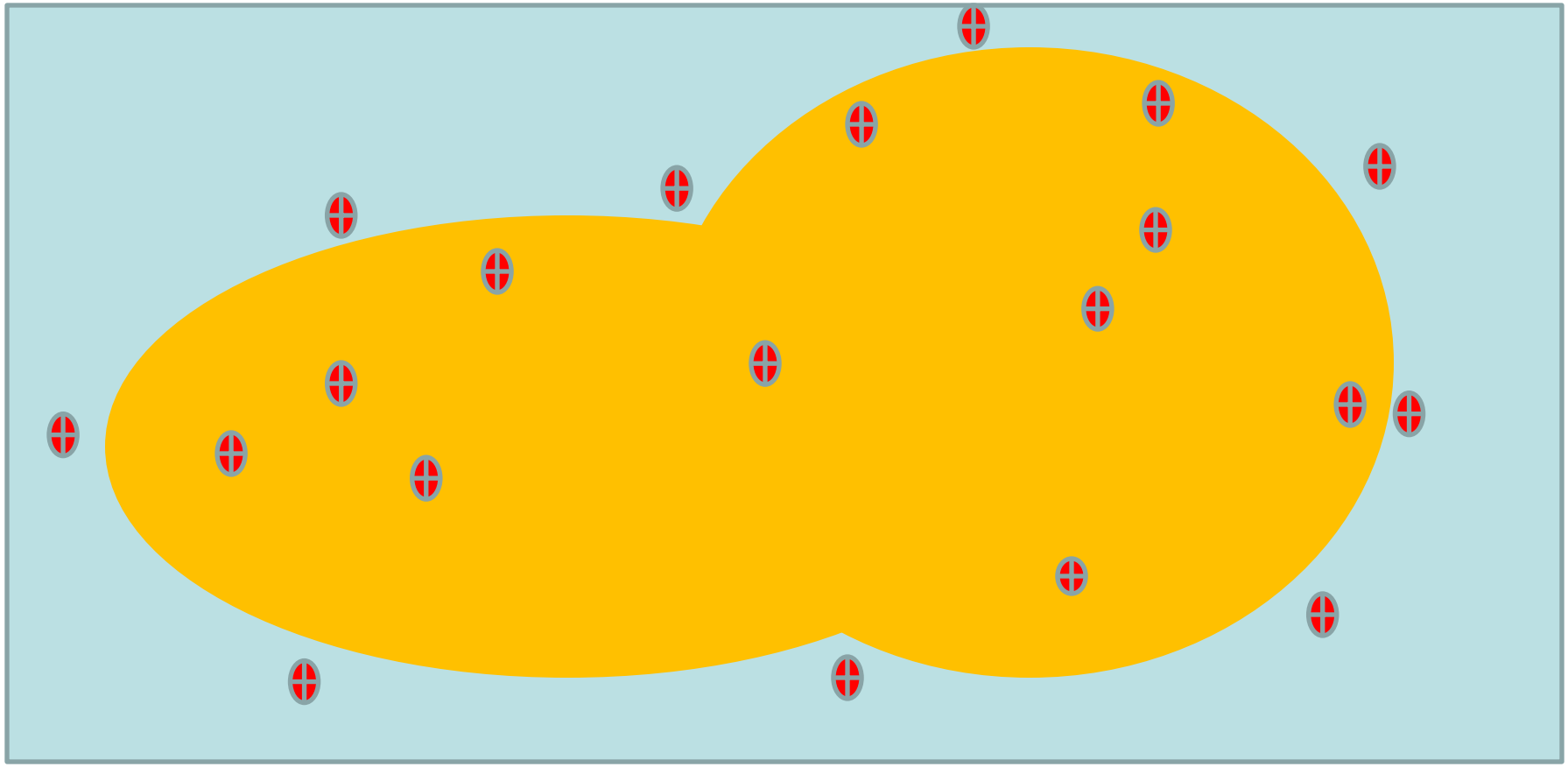


RCL Exceedances Using 10^{-5} Cumulative Exclusively

- 85% of samples still exceed (gray shading)
- Individual 10^{-6} threshold for Naphthalene shows little risk contribution
- Hazard Index insignificant

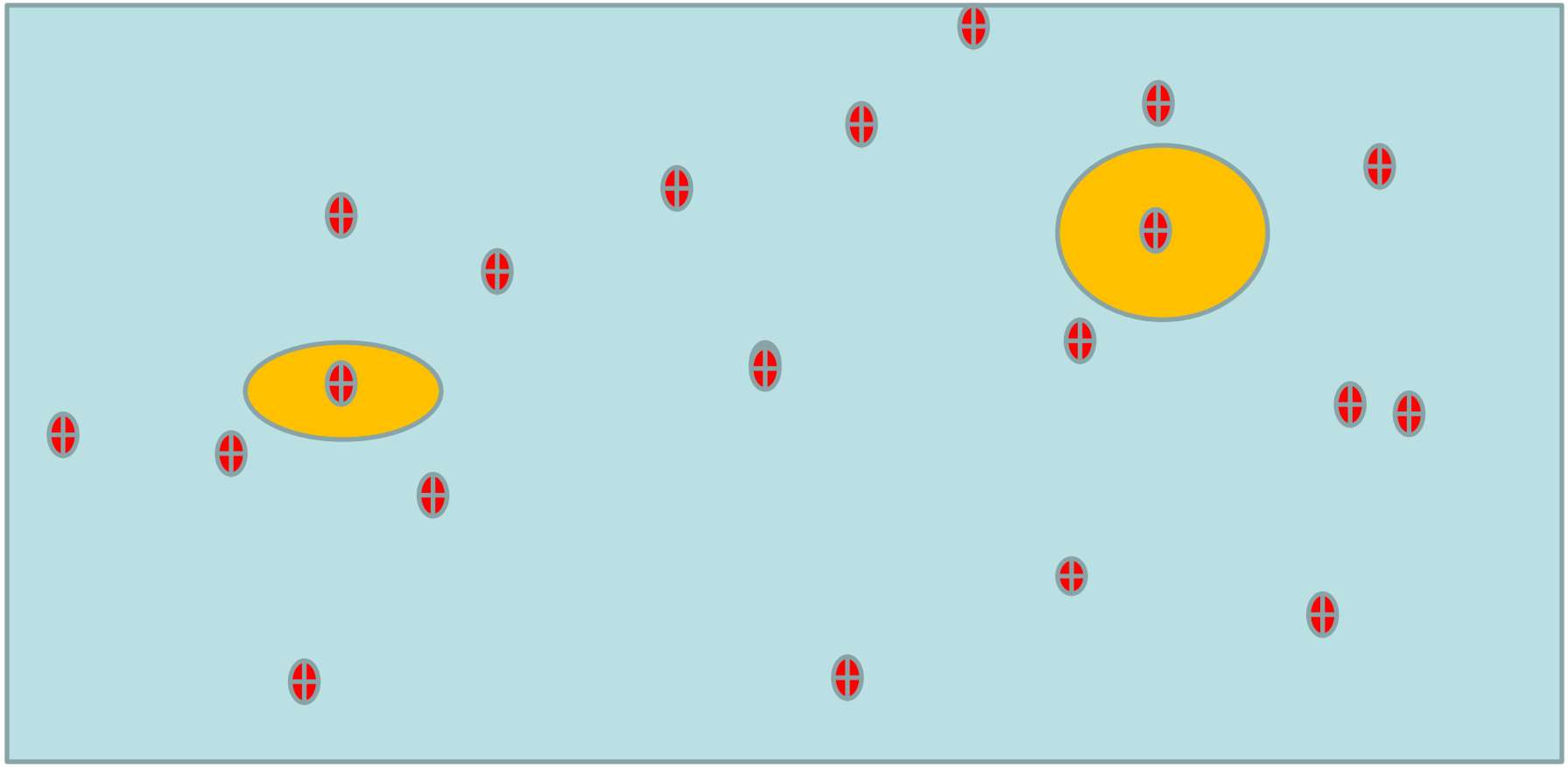


Evaluating New Approach



Example Site – Cap area with current RCLs

Evaluating New Approach



Example Site–Cap area with proposed RCLs

Evaluating New Approach

- WDNR standards more restrictive than other Region V states.
- Proposed approach = similar values to other Region V states.
- New approach is consistent with areas with historic atmospheric deposition of PAHs from autos, industry, etc.

Risk Assessment Option – NR 722.11

- Risk-based approach allowed when attaining compliance with the RCLs in NR 720 is not practicable.
- Modified RCL spreadsheet proposed
- Process out for public comment

Risk Assessment Option – NR 722.11

Current Spreadsheet

BRRTS # :	# of Soil-Concentration Entries:	Number of Individual Exceedance	(Cumulative) Hazard Index	(Cumulative) Cancer Risk
Type BRRTS No. Here (If Known)	12	2	0.7174	6.8E-06

Bottom-Line: NO! This NON-INDUSTRIAL site sampling location will need either further cleanup to lower contaminant levels or the construction of a cap/cover to address the direct-contact pathway.

Date of Entry: 3/29/2017.
Date of Worksheet Used: 03/14/2017.

List below only has contaminants with data.

Contaminant	CAS Number	NC RCL (mg/kg)	C RCL (mg/kg)	Not-To-Exceed D-C RCL (mg/kg)	Basis	BTV (mg/kg)	INPUTTED Site Data (mg/kg)	Flag E = Individual Exceedance!	Hazard Quotient (HQ) from Data	Cancer Risk (CR) from Data
Naphthalene	91-20-3	178.	5.52	5.52	ca		5.		0.0281	9.1E-07
Benzo[a]pyrene	50-32-8	17.8	0.115	0.115	ca		0.3	E	0.0169	2.6E-06
Benz[a]anthracene	56-55-3	-	1.14	1.14	ca		0.2			1.8E-07
Benzo[b]fluoranthene	205-99-2	-	1.15	1.15	ca		0.2			1.7E-07
Benzo[k]fluoranthene	207-08-9	-	11.5	11.5	ca		0.2			1.7E-08
Chrysene	218-01-9	-	115.	115.	ca		0.2			1.7E-09
Dibenz[a,h]anthracene	53-70-3	-	0.115	0.115	ca		0.2	E		1.7E-06
Indeno[1,2,3-cd]pyrene	193-39-5	-	1.15	1.15	ca		0.2			1.7E-07
Methylnaphthalene, 1-	90-12-0	4,180.	17.6	17.6	ca		17.		0.0041	9.7E-07
Methylnaphthalene, 2-	91-57-6	239.	-	239.	nc		100.		0.4184	
Arsenic, Inorganic	7440-38-2	34.9	0.677	0.677	ca	8.	8.			
Lead and Compounds	7439-92-1	400.	-	400.		52.	100.		0.25	

Risk Assessment Option – NR 722.11

Current Spreadsheet

Not-To-Exceed D-C RCL (mg/kg)	Basis	BTV (mg/kg)	INPUTTED Site Data (mg/kg)	Flag E = Individual Exceedance!
5.52	ca		5.	
0.115	ca		0.3	E
1.14	ca		0.2	
1.15	ca		0.2	
11.5	ca		0.2	
115.	ca		0.2	
0.115	ca		0.2	E
1.15	ca		0.2	
17.6	ca		17.	
239.	nc		100.	
0.677	ca	8.	8.	
400.		52.	100.	

Risk Assessment Option – NR 722.11

Current Spreadsheet

	Number of Individual Exceedance	(Cumulative) Hazard Index	(Cumulative) Cancer Risk
12	2	0.7174	6.8E-06

NO! This NON-INDUSTRIAL site sampling location will need either further cleanup to lower contaminant levels or the construction of a cap/cover to address the direct-contact pathway.

Risk Assessment Option – NR 722.11

Modified Spreadsheet

BRRTS # :
Type BRRTS No. Here (If Known)

# of Soil-Concentration Entries: 12

(Cumulative) cPAH Cancer Risk	Number of Individual Exceedance	(Cumulative) Hazard Index	(Cumulative) Cancer Risk
4.9E-06	0	0.7174	6.8E-06

Bottom-Line: Yes, levels are below direct-contact concern.

Date of Entry: 3/29/2017.
Date of Worksheet Used: 03/14/2017.

List below only has contaminants with data.

Column for cPAHs

Contaminant	CAS Number	NC RCL (mg/kg)	C RCL (mg/kg)	Not-To-Exceed D-C RCL (mg/kg)	Basis	BTV (mg/kg)	INPUTTED Site Data (mg/kg)	cPAH Cancer Risk from Data	Flag E = Individual Exceedance!	Hazard Quotient (HQ) from Data	Cancer Risk (CR) from Data
Naphthalene	91-20-3	178.	5.52	5.52	ca		5.			0.0281	9.1E-07
Benzo[a]pyrene	50-32-8	17.8	0.115	0.115	ca		0.3	2.61E-06	cPAH	0.0169	2.6E-06
Benz[a]anthracene	56-55-3	-	1.14	1.14	ca		0.2	1.75E-07	cPAH		1.8E-07
Benzo[b]fluoranthene	205-99-2	-	1.15	1.15	ca		0.2	1.74E-07	cPAH		1.7E-07
Benzo[k]fluoranthene	207-08-9	-	11.5	11.5	ca		0.2	1.74E-08	cPAH		1.7E-08
Chrysene	218-01-9	-	115.	115.	ca		0.2	1.74E-09	cPAH		1.7E-09
Dibenz[a,h]anthracene	53-70-3	-	0.115	0.115	ca		0.2	1.74E-06	cPAH		1.7E-06
Indeno[1,2,3-cd]pyrene	193-39-5	-	1.15	1.15	ca		0.2	1.74E-07	cPAH		1.7E-07
Methylnaphthalene, 1-	90-12-0	4,180.	17.6	17.6	ca		17.			0.0041	9.7E-07
Methylnaphthalene, 2-	91-57-6	239.	-	239.	nc		100.			0.4184	
Arsenic, Inorganic	7440-38-2	34.9	0.677	0.677	ca	8.	8.				
Lead and Compounds	7439-92-1	400.	-	400.		52.	100.			0.25	

Risk Assessment Option – NR 722.11

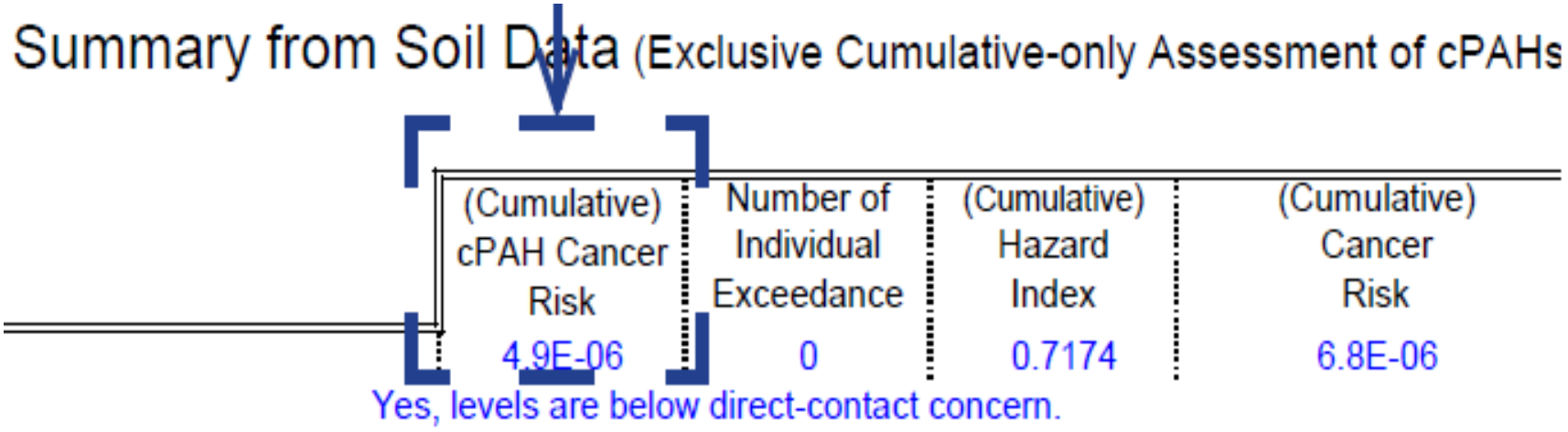
Modified Spreadsheet

Column for cPAHs

INPUTTED Site Data (mg/kg)	cPAH Cancer Risk from Data	Flag E = Individual Exceedance!	Hazard Quotient (HQ) from Data	Cancer Risk (CR) from Data
5.			0.0281	9.1E-07
0.3	2.61E-06	cPAH	0.0169	2.6E-06
0.2	1.75E-07	cPAH		1.8E-07
0.2	1.74E-07	cPAH		1.7E-07
0.2	1.74E-08	cPAH		1.7E-08
0.2	1.74E-09	cPAH		1.7E-09
0.2	1.74E-06	cPAH		1.7E-06
0.2	1.74E-07	cPAH		1.7E-07
17.			0.0041	9.7E-07
100.			0.4184	
8.				
100.			0.25	

Risk Assessment Option – NR 722.11

Modified Spreadsheet



Risk Assessment Option – NR 722.11

- Must input data for all compounds into spreadsheet
- Use full MDL levels for NDs
- Uses approx. 15-20% of overall cumulative 5 $x10^{-6}$ cPAH risk capacity, depending on actual MDLs. With extensive analytical interference, percentage can be higher

Risk Assessment Option – NR 722.11

- **Relative Effects (based on data review):**
- Cumulative risk of 5 x10^{-6} for seven cPAHs:
- Significant increase in acceptable B(a)P levels, depending on relative PAH mixture
- B(a)P and Dibenzo(a,h)anthracene tend to drive direct contact RCL exceedances in moderately impacted soils.

Third Deliverable: Study is Forthcoming

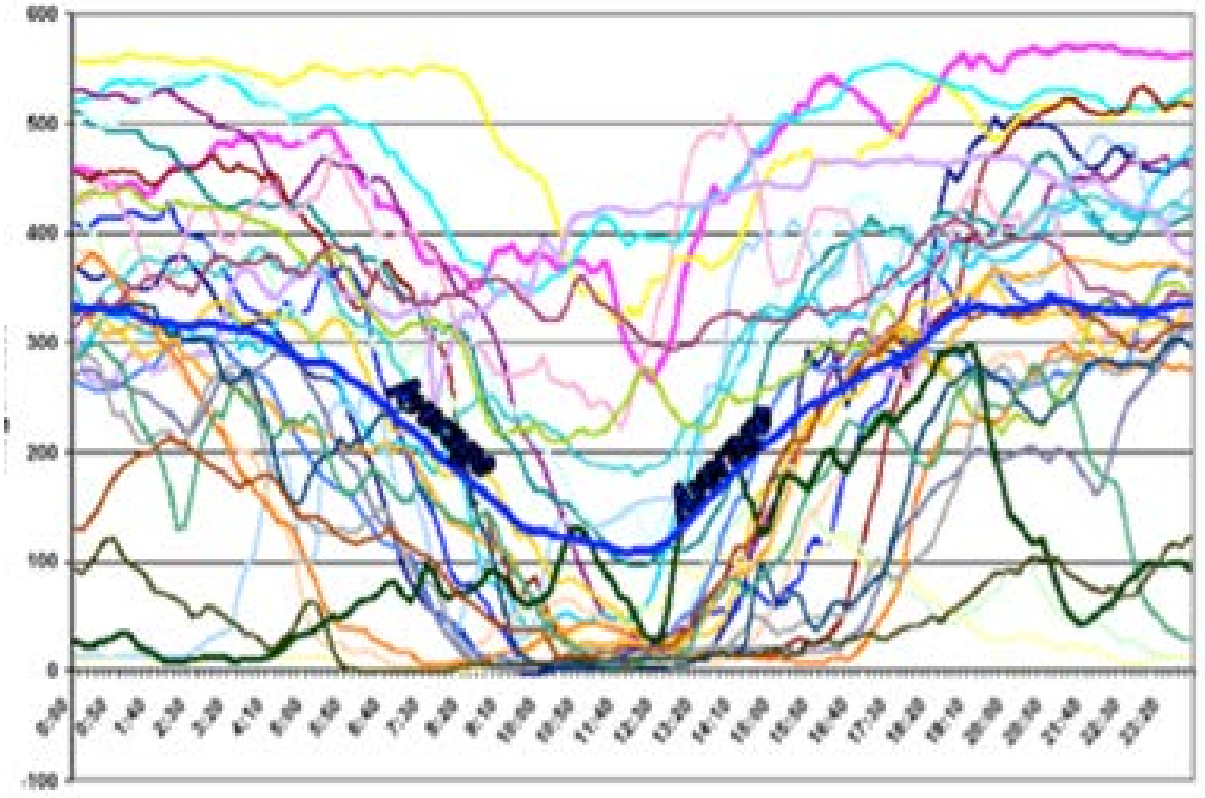
PAH BACKGROUND STUDY IN MILWAUKEE

3. PAH Background Study

- Shallow soil samples collected in Milwaukee County parks.
- Samples analyzed for PAHs.
- Determine background threshold value for PAHs originating from atmospheric deposition.
- Use findings to guide site remediation requirements.

What's Next?

- PAH Background Study



Soil Management Next Steps

- Process Guidance Document
  - Compounds/concentration considered for non-landfill management
    - No or very limited VOCs
    - Vapor and migration concerns
    - Direct Contact risk – if protected, levels above DC RCL are acceptable if not leaching to gw
    - SPLP testing – sample collection reccomendation

SPLP Testing Methodology

- When to use this
- What method to use
- How to select samples
- How to use the data

Soil Management Next Steps

- Acceptable receiving site conditions for certain contaminants, concentrations and quantities
  - Soil type – source and receiving site
  - Stability, bathtub effect
  - Depth to groundwater
  - Nearby receptors
  - Land use

Soil Management Next Steps

- Protective measures required for certain material placement
  - Capping – variable requirements
  - Land use restrictions/zoning
  - Historic Fill Exemption requirement
  - Future building requirements
  - Approval for future excavation/relocation

Format for this info

- How should the guidance be “built”
- What information should be included?
- How can it be presented so as to be most useful?

Consultant Days

- April 12th in Stevens Point
- April 20th in Pewaukee

"Complete Site Investigation
Fastest way to Closure"

- Last Day to Register is Thursday