



REMEDIATION ROUNDTABLE

May 8, 2012



AGENDA

Announcements:

- New Workgroup on 95% UCL
- Revised TA Application Form

Updates:

- Status of Proposed RSRs



AGENDA

Short Presentations with Q&A:

- Verifications: Processing, Metrics, and Improved Forms
- Spills Reporting and Case Closure
- Urban Fill Subgroup Report Out
- 1,4-Dioxane: Emerging Contaminant Issue



NEW SURVEY - BACKGROUND

- Background rated the second highest priority in Guidance Topics Survey (Urban Fill was first)
- 15 questions designed to get your feedback
- Will help the Remediation to develop guidance on determining background conditions
- Available online from April 25 – May 31
<http://www.surveymonkey.com/s/CTDEEPRemediationBackground>



ANNOUNCEMENT

New Workgroup: 95% UCL

CARL GRUSZCZAK



Connecticut Department of Energy and Environmental Protection

95% UCL WORKGROUP

- Activity: Provide recommendations on performing 95% UCL Calculations
 - Datasets – appropriateness and applicability
 - Statistical Methods – calculation spreadsheets
- Timeframe: May - November 2012
 - Kick-off meeting on May 22 / 10am – 12pm / DEEP Conf. Rm. 2B
- Report Outs: August and November Roundtables



95% UCL WORKGROUP

- Logistics:
 - 8 selected by lottery:
 - E-mail and drop-box
 - Listserv notice of who was randomly selected on Tuesday, May 15
 - DEEP Sponsors:
 - Facilitator: Carl Gruszczak, Jr.
 - Resource: Carolyn Fusaro



95% UCL WORKGROUP

Questions / Comments

Please state your name and
speak loudly.

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ANNOUNCEMENT

Revised TA Application Form and New General Permits

KEN FEATHERS



Connecticut Department of Energy and Environmental Protection

TEMPORARY AUTHORIZATIONS

Document Flow

- Streamlining application processing
- Improved application tracking

Revised Application Form

- Current status: in internal review
- Form collects standardized summary of supporting documents



GENERAL PERMITS

- Additional General Permits for in situ remediation discharges are in development
 - In-Situ Chemical Oxidation
 - Anaerobic Degradation (dechlorinization)
- Expect drafts to be available around the time of the next Roundtable



TAs AND GENERAL PERMITS

Questions / Comments

Please state your name and
speak loudly.

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PROPOSED RSRs

JAN CZECZOTKA



Connecticut Department of Energy and Environmental Protection

PROPOSED RSRs - STATUS

- RSRs legislative status
 - Briefing 4-20-12 for Governor's Office, OPM and Attorney General
 - Expect to get feedback after 5-9-12 (end of legislative session)
 - Need “green light” to proceed
- Regulation process follows procedures of CGS 4-168 through 4-172



PROPOSED RSRs – NEXT STEPS

1. Public “Notice of Intent to Amend Regulations and hold a Public Hearing” published in the CT Law Journal and DEEP Web (30 days)
2. DEEP may hold informational meeting prior to Public Hearing
3. Public Hearing, oral and written testimony accepted on RSR amendments; Record Closed
4. Hearing Report - final proposed regulations and fiscal note prepared by DEEP



PROPOSED RSRs – NEXT STEPS

5. Final proposed Regulations and associated documents submitted to Commissioner for approval
6. DEEP notifies all interested parties of decision to take action on regulations and availability of final wording (interested parties = Hearing commenters)
7. DEEP submits final regulations to Attorney General for “Legal Sufficiency” approval per CGS 4-169



PROPOSED RSRs – NEXT STEPS

8. DEEP submits final regulations to Office of Fiscal Analysis and Comm. of Cognizance (Environment Committee)
9. DEEP submits final regulations for approval to LRRC per CGS 4-170
10. Regulations filed with Secretary of State Office per CGS 4-172 (Regulations final upon Filing)
11. Publication of Regulations in the CT Law Journal



PROPOSED RSRs

- TPH Criteria status
 - ETPH staying in regs package
 - VPH and EPH are under consideration (public feedback) and not part of regs package
- Important to support so that changes that make it easier to do your job and achieve compliance are passed



PROPOSED RSRs

Questions / Comments

Please state your name and
speak loudly.

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Verifications: Processing, Metrics, and Improved Forms

ROB ROBINSON



Connecticut Department of Energy and Environmental Protection

LEP PROGRAM

- Program is 16 years old
- Current roster of 361 LEPs
- Avg 85% of Remediation cases are under oversight of LEPs
- Rate of site closures has increased with LEP Program



LEP PROGRAM

To promote consistency for the investigation and remediation of properties/release areas, numerous guidance documents have been developed with coordination of DEEP and EPOC (and updated as necessary).

- Site Characterization Guidance Document
- Verification Report Guidance Document

LEP PROGRAM

To promote consistency for the documentation of compliance:

- Verification Forms have been provided
 - Forms updated on occasion

➤ **New and Improved Verification Form**



VERIFICATION PROCESSING - ADMIN

- All Forms are checked for completeness:



- If complete, logged in (Ver# auto-assigned)



VERIFICATION PROCESSING - ADMIN

Due to maturity
of LEP Program
and confidence
of stakeholders

- DEEP no longer screens all verifications

Streamlined
Screening
Process

- All verifications forwarded to Audit Program Coordinator
 - Data management
 - Administrative Review

VERIFICATION PROCESSING - ADMIN

➤ Admin Review = completeness check

✓ High altitude fact check

- Degree of historical DEEP involvement
- Black & white application of RSRs
- Self-implementing options used
- Documentation of Commissioner approvals



VERIFICATION PROCESSING - TECHNICAL

Some Not Screened

- May still include query of District Supervisor or staff if receipt of verification raises a concern

Some Screened

- Screening process has been LEAN'ed
 - Global to specific
 - Case-by-Case



VERIFICATION PROCESSING - TECHNICAL

- If identified for standard Screening:
 - Verification package forwarded to District Supervisor for assignment to staff

 - Staff completes standard Screening in accordance with established protocol
 - Review of Verification Report



VERIFICATION PROCESSING

Streamlined Screening Process

Faster Processing for Response Document

- Avg processing time for No-Audit Letters
 - 2009 = 104 days
 - 2011 = 63 days



DEEP DECISION-MAKING

- Verification DEEP Response Document
 - ✓ No-Audit
 - ✓ Notice of Audit

- Combined 60+ years of experience imbedded in DEEP response to verifications
 - ✓ Staff +/-or ACP (Audit Program Coordinator)
 - ✓ District Supervisor
 - ✓ Assistant Director



VERIFICATION METRICS

as of 12/31/11

➤ 613 Verifications

55	Form II's
143	Form IV's (Supporting)
57	Final Form IV's
289	Form III's
9	Portion of an Establishment
43	VRP verifications



VERIFICATION METRICS

as of 12/31/11

- **387** verifications not selected for audit
 - Based on screening or non-screening
- 257 **No-Audit** letters issued
- 130 “filed” with no letter
- **85% of all verifications are in good standing**



AUDIT METRICS

as of 12/31/11

- 31% of verifications selected for audit (192)
- Detailed presentation of Audit Program
Forthcoming
 - Audit Program: Process, Metrics and
Considerations



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VERIFICATION FORM

- ✓ New and Improved
- ✓ Provides for information up-front
- ✓ Promotes expedited processing
- ✓ Minimizes potential need for DEEP Screening or File Review (which = AUDIT)
- ✓ Provides a mechanism for LEPs to self-check verification



VERIFICATION FORM

Completion of
Investigation TF

Remedial Action
Plan TF

VERIFICATION
FORM

Demonstration of
Compliance Checklist

Certification by
Certifying Party



VERIFICATION FORM

- Part I: Site Information
- Part II: Verification
- Part III: Remediation of Environmental Media
 - A. Soil
 - B. Groundwater and Surface Water
 - C. Groundwater and Soil Vapor
- Part IV: Receptors
- Part V: Certification



VERIFICATIONS and PA 11-141

PA 11-141: Applicability of Verification

- Date that Form III was filed or
- Date that a complete Phase II investigation was completed
 - **Only the later of these two is applicable option**
- **OR** the date that verification was rendered (signed)



VERIFICATION FORM

Part II: Verification - Applicable dates

Part II: Verification

This verification pertains to the Form III filed with the Department on [REDACTED] and assigned Rem# 1235.

In accordance with CGS §22a-134a, as amended by PA 11-141, the certifying party of a Form III is not required to investigate or remediate any release or potential release of pollution at the parcel that occurs after the completion of Phase II Investigation, as defined in the Site Characterization Guidance Document, or from and after the date the Form III was executed, whichever is later. **Below, enter all of the following dates: the date the Form III was filed, completion date of the Phase II, and the date this verification is rendered, then check which date this verification applies to:**

Date of Property Transfer: [REDACTED]

Date of this verification: [REDACTED]

Date of complete Phase II ESA: [REDACTED]



VERIFICATION FORM

Part III: Remediation of Environmental Media

- Specific references to applicable RSR sections

DEEP advises that each referenced RSR section be reviewed prior to completing form

- Verification form is in checklist format = **details** of all requirements and provisions **not included** on form
- Ensures accurate application of RSRs



VERIFICATION FORM

Part III: Remediation of Environmental Media

- Each application includes space to identify the applicable release areas



Rem#:

Application of Pollutant Mobility Criteria		22a-133k-2(e)(2)	Applicable Release Area ID #'s
<input type="checkbox"/>	Representative sampling with 20+ samples	22a-133k-2(e)(2)(A)	<input type="text"/>
<input type="checkbox"/>	Representative sampling with <20 samples	22a-133k-2(e)(2)(B)	<input type="text"/>
<input type="checkbox"/>	Confirmation sampling of remedial excavation	22a-133k-2(e)(2)(C)	<input type="text"/>
<input type="checkbox"/>	Alternative analytical method	22a-133k-2(e)(3)(A)	<input type="text"/>



VERIFICATION FORM

Part III: Remediation of Environmental Media

- If Commissioner Approval used to achieve compliance with any criteria, Approval info requested at that subsection of Form
 - ✓ Date of Approval letter
 - ✓ Copy of Approval letter

<input type="checkbox"/>	Additional Polluting Substance (Commissioner approval)	22a-133k-2(b)(4)	<input type="checkbox"/>
	Approval date(s): <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Copy(s) attached <input type="checkbox"/>	



VERIFICATION FORM

Part III: Remediation of Environmental Media

- If ELUR used to achieve compliance with any media:
 - ✓ ELUR info requested at that subsection of Form
 - ✓ Copy of Certificate of Title

<input type="checkbox"/>	DEC not applicable – soil rendered inaccessible (if <15 ft bgs and ELUR recorded)	22a-133k-2(b)(3)	<input type="checkbox"/>
	Date Certificate of Title for recordation of ELUR submitted to Commissioner:		<input type="checkbox"/>
	Copy is attached	<input type="checkbox"/>	



VERIFICATION FORM

Part III: Remediation of Environmental Media

- Groundwater - All conditions should be able to be checked as complete in order to support verification

Groundwater Remediation Standards:		RCSA 22a-133k-3
<input type="checkbox"/>	All plumes have been investigated in accordance with prevailing standards and guidelines, including the SCGD or equal alternative approach.	
<input type="checkbox"/>	A sufficient quantity and quality of groundwater data has been collected to understand seasonal and dimensional groundwater conditions.	
<input type="checkbox"/>	Effects on hydraulic head and geochemistry changes due to active remediation are absent, if applicable.	
<input type="checkbox"/>	Steady-state geochemical conditions have been established and documented, when applicable.	
<input type="checkbox"/>	The Verification Report documents and explains how the Groundwater Remediation Standards were achieved for each plume.	

VERIFICATION FORM

Part IV: Receptors

- ID water classification – land uses
- Indicate # water supply wells in vicinity
 - If groundwater impacted
- Indicate if plume migration off-site

- ID # of supply wells impacted
- Indicate permanent resolution



VERIFICATION FORM

Part V: Certification

Certifying Party Certification

"In accordance with Section 22a-134a(g) of the CGS, I submit this Verification rendered by a licensed environmental professional (LEP), and the attached Verification Report, which has been approved in writing by a LEP, and other applicable documentation."

Check if applicable

This verification incorporates a "portion of an establishment" verification rendered on: [REDACTED]

This verification incorporates an "Interim" verification rendered on: [REDACTED]

[REDACTED]
Printed Name of Signatory for Certifying Party

[REDACTED]
Title

Authorized Signature for Certifying Party

[REDACTED]
Date

Certifying Party: [REDACTED]

Address: [REDACTED]

City/Town: [REDACTED]

State: [REDACTED]

Zip Code: [REDACTED]

Phone: [REDACTED]

VERIFICATION FORM

- Prescribed by the Commissioner
 - Required by Law
 - Incomplete Form ...
 - Will not be processed, or
 - Will receive a notice of deficiency, or
 - Verification will be flagged for audit
- **DEEP response actions will depend on case-by-case assessment**



VERIFICATION FORM

- Form III format presented here
 - basis for other revised verification forms
- Verification Report Guidance Document will be revised
 - copies of Commissioner Approvals will no longer be requested in VR (since attached to Verification Form)
 - DOC will no longer be requested in VR



CONSIDERATIONS

Our goals are the same:

Remediate releases, protect human health and the environment, and get polluted properties back into the mainstream economy – jobs, profits, and taxes



Connecticut Department of Energy and Environmental Protection

ROB ROBINSON

CONSIDERATIONS

- Impediments to attaining site closure is apparently a common theme in the transformation process
- We want to identify these impediments (administrative and technical) and resolve them!



RESOLUTIONS

Future Goal

- Less DEEP involvement at all levels while maintaining program integrity and public confidence

DEEP advocates EPOC Peer Review process

- Broader consensus
- Consistency in report quality

Enhanced Communication

- Remediation Roundtable
- EPOC Technical Evening Meets
- Remediation Division/EPOC Board Liaisons

VERIFICATIONS

Questions / Comments

Please state your name and
speak loudly.

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Spill Reporting and Response Managing Emergency Response and Its Challenges

PETER ZACK



Connecticut Department of Energy and Environmental Protection

RELEASE REPORTING AND RESPONSE

Introduction

Topics

- Statutory Authority Related to Release Reporting and Response
- Emergency Incident Reporting Metrics
- Responsibility for Cleaning up a Release
- Emergency Incident Report



STATUTORY RESPONSIBILITY

CGS Section	Title of Section
22a-449	Duties and Powers of the Commissioner
22a-453	Coordination of Activities with other agencies. Contracts for Services.
22a-450	Report of a discharge, spill, loss, seepage or filtration.
22a-451	Liability for pollution, contamination or emergency. Emergency spill response account.
22a-454	Permit for collection , storage or treatment, containment, removal or disposal of certain substances, materials or wastes.



DEEP SPILL REPORTING

- DEEP operates a 24 hour statewide emergency response dispatch center that receives reports of hazmat incidents including petroleum releases and chemical releases
- Incident reports made by responsible parties, citizens, and Fire Departments
- Phone calls recorded and information is entered into the Spill Incident Tracking System (SITS)
- Emergency Incident Report is generated with a case number
- Challenges due to the uniqueness of each spill incident



METRICS ON REPORTED SPILLS

Year of Reported Incident	Number of Releases Reported	Total DEEP Emergency Responses
2008	8,408	1,467
2009	7,278	1,543
2010	7,576	1,564
2011	8,178	1,725



REPORTED SPILLS FOR 2008, 2009, 2010 and 2011

Type of Incident Reported	Reported vs. Responded			
	2008	2009	2010	2011
Petroleum	4,472 / 1,084	4,171 / 1,033	4,153 / 991	4,447 / 1,135
Chemical	2,034 / 335	2,021 / 327	2,145 / 332	1,984 / 301
Dielectric	982 / 91	787 / 95	986 / 123	1,383 / 187
Sewage	389 / 14	363 / 21	360 / 19	427 / 19
Other	138 / 114	159 / 88	162 / 85	161 / 73
Haz Waste	104 / 51	109 / 49	68 / 43	84 / 49
Gas Emission	64 / 24	55 / 21	65 / 33	60 / 34
Biomedical	8 / 6	23 / 8	15 / 9	6 / 5

Incident Type	2008	2009	2010	2011
Above Ground Tank Failure	223	205	264	318
Blow Back	46	58	49	49
Cargo Tank Failure	5	2	3	1
Container Failure	281	304	286	433
Dumping	398	359	300	396
Fire	140	149	151	136
Fuel Tank Failure	82	85	86	101
Hose Failure	390	392	472	541
Hull Fracture	0	0	0	2
Inground Tank Failure	550	419	478	468
MV Accident	1,970	1,979	2,069	2,026
Natural	54	90	204	229
Open Hatch	13	5	12	9
Other	1,714	1,495	1,775	2,310

Incident Type	2008	2009	2010	2011
Overfill	400	479	436	424
Power Failure	5	7	5	10
Pumping Related	64	79	84	75
Saddle Tank Failure	38	23	30	38
Seepage	664	471	72	6
Sinking	10	5	5	14
Trans/Capac	496	407	590	788
Transfer Line Failure	185	189	228	149
Valve Failure	93	66	90	97
Vandalism	12	3	11	13

Surface Spills From Improper Drum Storage



Surface Water Releases



Containers of Hazardous Materials



Leaking Storage Tanks



Chemical Vapor Releases



Transportation Accidents



Hazardous Material Fires



Connecticut Department of Energy and Environmental Protection

SPILL RESPONSE

How does DEEP decide which reports warrant a response?

Supervising Emergency Response Coordinator (ERC)
receives information:

- Each Incident Report made is evaluated
- Many factors are considered based on the type and quality of the information received
- Fire Chief may request ER for technical advice, equipment, or contractor support



EMERGENCY RESPONSE

Emergency response begins through assignment.

1. ERU personnel respond within minutes of assignment
 - Receive instructions to develop appropriate course of action and recommend appropriate clean-up procedures
 - Assignments made by Division supervisors or management
2. Assigned ERC compiles all necessary case documentation and serves as lead site coordinator



EMERGENCY RESPONSE

3. ERC makes initial verbal and written internal referral to other DEEP programs where violations and/or environmental problems found during the course of response or follow-up investigations
4. Use of DEEP ERU Field Incident Report (standard format) to further describe or clarify information reported



ERC RESPONSE OBJECTIVES

- Respond immediately to hazardous materials spills, discharges, and releases
- Advise public safety authorities of current on-scene conditions and recommended actions
- Take samples and collect data on materials spilled
- Determine responsible party for spillage
- Provide the responsible party with DEEP Licensed Spill Clean-up Contractors List



RESPONSE OBJECTIVES

- Determine the direct risk to public health or the environment
- Protect the environment and public from exposure
- Mitigate any ongoing release
- Contain and recover
- Identify any significant environmental hazards
- Direct RP to take action
- DEEP action if RP is unwilling or unknown
 - Seek cost recovery from RP



INCIDENT FIELD REPORT INFO

- Type of material (identification)
- Quantities of material
- Hazardous properties of the material
- Responsible Party
- Measures taken to contain or control the release (mitigation)
- Potential for routes of exposure to the public or sensitive environmental receptor
- Documentation of the level of risk to the public or environmental impact that remains (further actions)



SPILL INCIDENT REPORT (example)

Emergency Response and Spill Prevention Division Emergency Incident Report

Case No.: 2012-01915

Staff Receiving Call: 205 COX, MICHAEL

Assigned To: 916 STAVOLA, ROSANNE

Date Reported: 04/20/2012

Time Reported: 10:22

Date of Release: 04/20/2012

Time of Release: UNKNOWN

Town of Release: GROTON

State of Release: CT

Location of Reported Release: OHIO AVE NEAR PLEASANT VALLEY ROAD NORTH RIGHT OFF RT 12

Reported By: DISPATCH

Phone: (860) 448-1562

Representing: GFD

Responsible Party: UNK

Phone:

Street Address:

Town:

State:

Zip Code:

Does the Responsible Party Accept Financial Responsibility? NO

Release Type: PETROLEUM

Release Substance: gasoline

Media: SURFACE WATER

GROUND SURFACE

Total Quantity: 0 Gallons 0 Cubic Yards 0 Cubic Feet 0 Drums 0 Pounds

Emergency Measures: Response requested

Has the Release Been Terminated?:

Type of Waterbody Affected: WETLANDS

Name of Waterbody Affected:

Total Quantity Recovered: 0 Total Quantity In Water: 0

Corrective Actions Taken: INVESTIGATED

Discharge Class: UNK

Cause of Incident: UNK

Agencies Notified: DEP DISPATCH

LOCAL FIRE DEPARTMENT

Status: OPEN



CASE CLOSURE RESPONSE DOCUMENTATION

The ERC's final report may contain:

Invoices

Approval letters

EPA authorization letters

Photos, slides, negatives

Sworn statements

Field notes

Incident Report from RP

Bid Proposals

Videos

Monitoring reports

Award letters

Discharge monitoring reports



EMERGENCY RESPONSE SERVICES

Emergency Incident case is “closed” when:

- Measures are implemented to mitigate the release
- Actions are taken to improve the quality of information reported
- Direct exposure to the public has been mitigated and impact of the release to the environment has been reduced
- All necessary documentation has been received and signed off by ERC and SERC
- Check box on the Incident Report is checked “closed”



INCIDENT REPORT “CLOSED” STATUS MEANS:

- ERU will no longer be the lead in the case and will not be taking further action (may refer to other regulatory jurisdictions)
- Incident mitigated or controlled to protect public health from direct exposure
- Direct exposure risk mitigated but in some cases further actions may be required to remove all potential exposures (RSR measures)
- Further follow-up may be needed by other state, municipal, or federal agencies for full regulatory compliance



INCIDENT REPORT “CLOSED” STATUS MEANS:

- State-lead cleanups may require further cost recovery actions and enforcement
- RPs may be subject to further enforcement actions with penalties (state lead or RP lead)
- Discharges without a permit are prohibited per statute - responsible party must clean up to the satisfaction of the Commissioner



SPILLS REPORTING AND CASE CLOSURE

Questions / Comments

Please state your name and
speak loudly.

www.ct.gov/dep/remediationroundtable



Urban Fill Workgroup Report Out

MAURICE HAMEL

KATHLEEN CYR

MICHAEL SUSCA



Connecticut Department of Energy and Environmental Protection

BACKGROUND

- Maurice Hamel, DEEP



URBAN SOILS WORKGROUP

- Work Group established June 2011
- 9 LEPs, 1 developer, 1 business, 1 attorney, 2 DEEP staff
- Define specific COCs and upper threshold values for Urban “Soil”
- Streamline investigation and remediation process consistent with SCGD and RSRs
- Minimize need for off-site disposal



WHAT IS CONSIDERED URBAN SOIL?

Urban Soil includes material deposited on a parcel that contains a mixture of one or more of the following: soil, coal ash, coal fragments, wood ash, asphalt paving fragments, clinkers, brick, concrete, glass, ceramics, metal fragments and incidental amounts of other construction and land-clearing debris



WHAT IS CONSIDERED URBAN SOIL?

Provided that:

- Contaminants present above RSR criteria in the material are not the result of a release;
- Deposition not prohibited at time of placement;
- Urban soil would not include materials such as foundry slag, casting sand or coal tar; and
- Urban Soil would be exempt from the pollutant mobility criteria under RSRs 22a-133k-2(f)



OVERVIEW

“Clean Fill” not included

Not limited to “fill” brought in from off-site

Not limited to inner city sites

Contaminants in Urban Soils considered to be a “release”

RSR exceedances require remediation

Standardized EC designs provided



PROGRAM ELIGIBILITY

- ✓ Meets Urban Soil definition for site history and chemical / physical characteristics
- ✓ If exceeds RSRs but below threshold values - render inaccessible
- ✓ All soil exceeding threshold values - standard remedial approach
- ✓ Investigate other AOCs separately
- ✓ A validated CSM supports the remedy



CHARACTERIZATION OBJECTIVES

- Basic understanding of lateral and vertical limits on-site
- Fewer samples - not trying to prove $< \text{RSR}$ criteria (similar to TBR)
- No PMC testing if below thresholds with no other releases (coal ash exemption only)
- Separately evaluate other releases or hot spots



PROPOSED LIST OF COCs

- Kathie Cyr, GZA GeoEnvironmental

Sub-workgroup Members:

Kathie Cyr

John Albrecht

Larry Hogan



PURPOSE OF THE COC LIST

Identify
constituents
common to
urban soil

Set upper
limits for
urban soil
concentra-
tions

Provide
framework
approach &
approval
process

Aid
character-
ization of
urban soils



HOW WAS THE COC LIST DEVELOPED?

Researched how other states evaluate urban fill (websites, phone calls)

- ITRC call for information

What chemical constituents and what ranges of concentrations are considered to be associated with urban fill?

- Received ~20 responses / 9 states listed compounds associated with urban fill

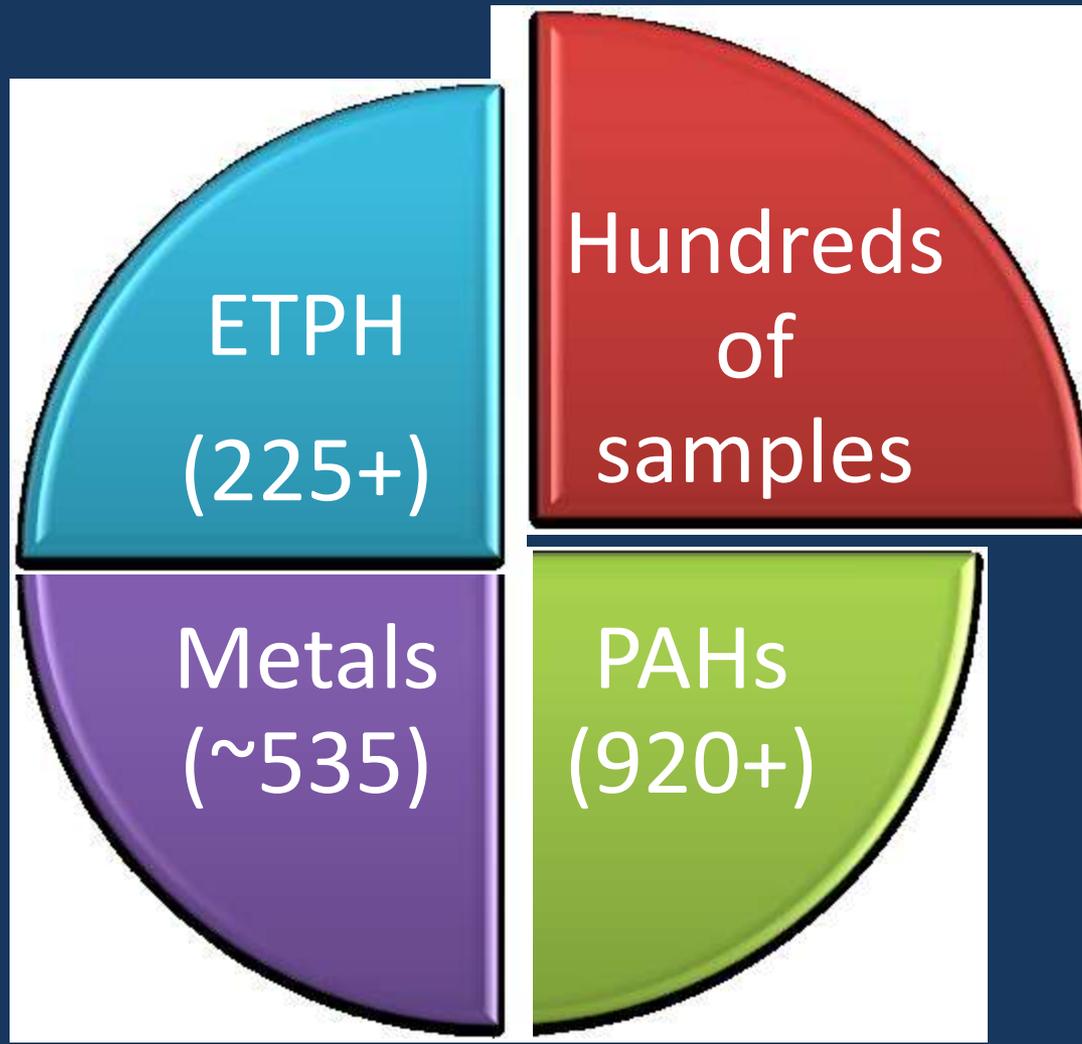
HOW WAS THE COC LIST DEVELOPED?

Evaluated soil data of CT sites with urban fill

- Validated data / compiled list
- Urban soil data from CT sites (8)
 - Bridgeport, East Hartford, Hartford, Middletown, New Haven, New London, Stamford, Waterbury



BODY OF KNOWLEDGE USED FOR COC LIST



Connecticut Department of Energy and Environmental Protection

KATHLEEN CYR

VALIDATION OF PROPOSED LIST OF COCs

- Relationship to other states' COC list
- Relationship between CT sites
 - Mean
 - Max
 - 95% UCL
- Comparison to RSRs DEC



Urban Fill Proposed COC List				CT DATA SUMMARY	
Compounds of Concern	RSR Criteria (see note 1) mg/kg		Work Group Suggested Thresholds	Ave of Maxs (8 sites)	Max of Maxs
PAHs	RDEC	I/CDEC			
<i>Acenaphthene</i>	1,000	2,500	<RSRs	13	34
<i>Acenaphthylene</i>	1,000	2,500	<RSRs	12	33
<i>Anthracene</i>	1,000	2,500	<RSRs	32	100
<i>Benzo(a)anthracene</i>	1	7.8	250	76	210
<i>Benzo(a)pyrene</i>	1	1	250	74	280
<i>Benzo(b)fluoranthene</i>	1	7.8	250	92	300
<i>Benzo[k]fluoranthene</i>	8.4	78	175	43	160
<i>Benzo[g,h,i]perylene</i>	1,000	2,500	<RSRs	43	54
<i>Chrysene</i>	84	780	200	68	190
<i>Dibenzo(a,h)anthracene</i>	1	1	40	10	39
<i>Fluoranthene</i>	1,000	2,500	<RSRs	160	430
<i>Fluorene</i>	1,000	2,500	<RSRs	22	83
<i>Indeno(1,2,3-cd)pyrene</i>	1	7.8	70	39	190
<i>2-Methylnaphthalene</i>	474	2,500	<RSRs	12	41
<i>Naphthalene</i>	1,000	2,500	<RSRs	14	43
<i>Phenanthrene</i>	1,000	2,500	<RSRs	121	360
<i>Pyrene</i>	1,000	2,500	<RSRs	153	350
Petroleum Hydrocarbons	500	2,500	4,200	4,815	xxx
Metals	mg/kg	mg/kg			
Antimony	27	8,200	<RSRs		
Arsenic	10	10	110	47	107
Beryllium	2	2	<RSRs		
Cadmium	34	1,000	40	77	380
Chromium, total	100	100	200	71	182
Lead	500.00	1,000	4,500	3,041	4,510
Thallium	5.4	160	10	NA	10

WHAT'S NEXT FOR COC LIST DEVELOPMENT?

- List additional metals that may be found in urban soils. Others?
- Request for more CT sites with Urban soils data
- Continued validation
- Please send data to:

DEP.remediationroundtable@ct.gov



ENGINEERED CONTROLS FOR URBAN SOILS

- Michael Susca, LBG

Sub-workgroup Members:

Mike Susca

George Gurney

Bert Sacco



ENGINEERED CONTROLS - APPROACH

- Evaluate DEEP's database of approved ECs
 - Identify those for DEC compliance
 - Identify those that might apply to urban soils
- Develop standardized EC designs that might be candidates for expedited approval
 - Lawns, planted areas, gravel/stone, paved surfaces
 - Maintenance, monitoring, inspection, financial surety
- Protective of human health and environment



LAWNS AND PLANTINGS



- Lawns
 - 9 inches of soil and warning layer
 - Turf Management Plan

- Flowers, shrubs and trees
 - 18 inches of soil, mulch and/or landscaping stone and warning layer at base (below root ball)
 - Plantings Management Plan
 - Vegetable gardens not included



GRAVEL/STONE SURFACES

- Uses such as gravel parking areas, rip-rap and stormwater features, retaining walls
- More durable/less susceptible to erosion than soil cover
- 9 inches of stone with warning layer



“DURABLE” SURFACES

- Uses such as walkways, parking lots
- Durable surfaces:
 - Concrete or brick pavers over sub-base and warning layer
 - Bituminous concrete or concrete over sub-base and warning layer
 - Combined thickness of 9 inches
- Lower inspection frequency as compared with less-durable surfaces



EXISTING CONDITIONS

- In some cases, existing conditions may be sufficiently protective
- Similar scenarios:
 - Lawn, Plantings, Gravel/Stone and “Durable” Surfaces
 - No warning layer, so some cover thicknesses are greater and more-frequent inspections are recommended



OTHER CONDITIONS

- Other EC requirements:
 - Maintenance Plan
 - Recommendations will include a standard outline
 - Recommended inspection frequency varies with durability of cover and presence/absence of warning layer
 - Financial Surety
 - Working on standardized approach



URBAN FILL WORKGROUP

Questions / Comments

Please state your name and
speak loudly.

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1,4-DIOXANE: EMERGING CONTAMINANT ISSUE

SHANNON POCIU



Connecticut Department of Energy and Environmental Protection

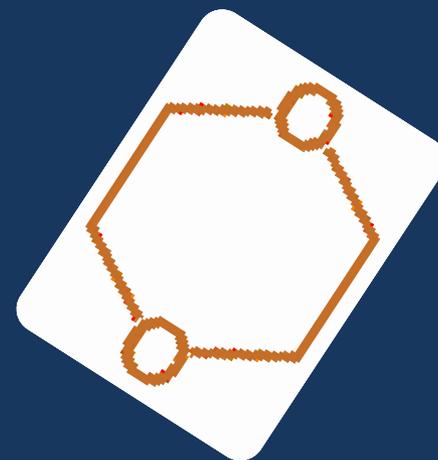
WHAT IS IT?

- Solvent stabilizer and corrosion inhibitor often found with TCA, possibly other chlorinated solvents (TCE?)
- Also used alone as a solvent
- Wide variety of applications



CHEMICAL PROPERTIES OF 1,4-DIOXANE

- Colorless, flammable liquid with faint pleasant odor
- Cyclic ether ($C_4H_8O_2$)
- Specific gravity 1.033
- Evaporates readily
- Mobile in soils (low Koc 1.23, log Kow -0.27)
- Completely soluble in water
- Relatively non-volatile in water (very low Henry's Law Constant of 4.88×10^{-6} atm-m³/mol)



WHAT HAPPENS TO 1,4-DIOXANE when it's released to...

Air

- Readily evaporates, moderate vapor pressure of 38.0 mm Hg at 25°C
- As a vapor, breaks down readily to form aldehydes and ketones



Soil

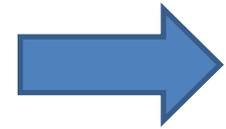
- Will migrate through soil rather than adsorb to particles



WHAT HAPPENS TO 1,4-DIOXANE when it's released to...

Water

- Completely soluble in water = travels ahead of other solvents in plume (similar to MTBE)
- Tends to stay dissolved, therefore low volatilization risk from groundwater
- Chemically stable, not expected to degrade once in groundwater or surface water



FACILITIES / OPERATIONS IN CT

Where 1,4-Dioxane Could Be Found

Degreasing operations	Electroplating/polishing
Paints, varnishes, lacquers	Inks, dyes, coatings, and adhesives
Pharmaceutical plants	Polymers, plastics, rubber manufacture
Semiconductors, electronic components	Commercial printing and photographic equipment
Pulp, paper, fiber manufacture	Explosives
Personal care products (cosmetics, detergents, shampoos)	



WHY DO WE CARE?



- EPA - Probable Human Carcinogen
 - Kidney and liver effects
- Persistence - not expected to biodegrade
- Found in drinking water supply wells

Not effective -
air stripping,
ion exchange,
reverse
osmosis

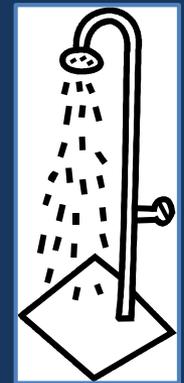
Limited
effectiveness
- GAC filters

Effective -
Advanced
oxidation, \$\$



ACTION LEVELS / RSRs

- New DPH Action Levels established in October 2011
 - 3 $\mu\text{g}/\text{L}$ – Drinking Water
 - 50 $\mu\text{g}/\text{L}$ – Bathing/Showering

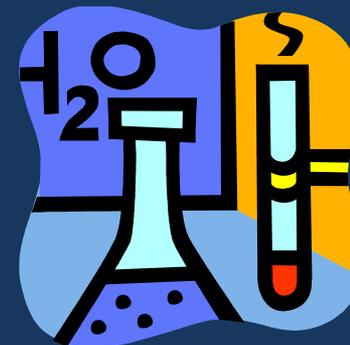


- RSR Criteria – not yet established
 - GWPC likely to mirror DPH Drinking Water Action Level of 3 $\mu\text{g}/\text{L}$



ANALYTICAL METHODS

- Currently, only 2 DPH-certified labs are approved for 1,4-dioxane analysis
 - Aqueous Samples – Modified EPA Method 8260 must be requested (heated purge & trap and SIM)
 - 1 $\mu\text{g}/\text{L}$ detection limit
- Other methods
 - Modified EPA Method 8270



1,4-DIOXANE RESOURCES

For more information:

<http://clu.in.org/contaminantfocus/default.focus/sec/1,4-Dioxane/cat/Overview/>

<http://www.atsdr.cdc.gov/toxprofiles/tp187.pdf>

DPH Fact Sheet:

http://www.ct.gov/dph/lib/dph/environmental_health/eoha/pdf/1_4_dioxane.pdf



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STAY TUNED...

- 1,4-Dioxane should be considered potential COC at sites with solvent releases, especially TCA
- Technical Assistance
 - Please share info on 1,4-dioxane at your sites with DEEP, especially occurrence with solvents other than TCA and fate and transport observations
 - If found in or near potable wells, contact DEEP concerning treatment options
- Contact Remediation Division project manager or shannon.pociu@ct.gov



1,4-DIOXANE

Questions / Comments

Please state your name and
speak loudly.

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REMEDIATION ROUNDTABLE

GENERAL Q&A

Please state your name and
speak loudly.

E-mail: DEP.remediationroundtable@ct.gov

Web: www.ct.gov/dep/remediationroundtable



THANK YOU

REMEDIATION ROUNDTABLE

Next meeting: August 14, 2012

Schedule and agenda on website

www.ct.gov/dep/remediationroundtable

Submit comments to Camille Fontanella at

DEP.remедiationroundtable@ct.gov



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