



REMEDIATION ROUNDTABLE

February 11, 2014



Connecticut Department of Energy and Environmental Protection

www.ct.gov/deep/remediationroundtable

Agenda

- Various Updates
- Year in review
- Transformation RSR Amendments: Wave 2
 - Recreational Direct Exposure Criteria
- Changes to Verification Forms and Guidance Document
- Temporary Releases from ELURs with Pre-approved Soil Management Plans
- Groundwater Compliance Monitoring
- In Situ Chemical Oxidation General Permit



Updates

- **November** - DRAFT Guidance for Calculating the 95% Upper Confidence Level for demonstrating compliance with the RSRs posted for public comment
- **December** - RCRA Corrective Action Ecological Receptor Exposure Pathway [Scoping Checklist](#)
- **December** - The Department of Economic and Community Development Office of Brownfield Remediation and Development announced its [Municipal Brownfield Assessment Grant Program](#)



Updates

- **January** - The [ELUR](#) webpage now reflects the complete change-over to the new ELUR application mandatory as of January 1, 2014.
- **February** -Technically Impracticable (TI) Guidance Document will be posted online soon
 - Question and Answer for TI Guidance will be on April 8, 2014 -1:30-3:30pm in the Phoenix Auditorium At DEEP
- EPOC RSR training course to be offered March 20, 2014- EPOC will have additional information coming soon



Risk Assessment Evaluation

- The contractor selected was CDM Smith, Inc.
- A public meeting to gather input will be held from 9-12 on March 12th, 2014 in the Phoenix Auditorium. More information about that meeting will be forthcoming
- A draft report is due to DEEP on July 1, 2014



Questions / Comments

Please state your name and
speak loudly

Submit comments to

DEEP.remediationroundtable@ct.gov

www.ct.gov/deep/remediationroundtable



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YEAR IN REVIEW

ROBERT BELL

ASSISTANT DIRECTOR

REMEDIATION DIVISION



Connecticut Department of Energy and Environmental Protection

Remediation 2013



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Transformation 2013

JAN	FEB Transformation Report.	MARCH RSR Wave 1 Final Proposed Amendmts.	APRIL
MAY	JUNE RSRs Amendments (Wave 1) adopted.	JULY Legislation Signed. ELUR Transition Protocol. UST Fund Reverse Auction.	AUG 3 RSR (Wave 2) PDDs.
SEPT	OCT Online UST Notifict'n. Revised Verification Form. TI Fact Sheet.	NOV Risk Evaluation RFP. 2 RSR (Wave 2) PDDs. 4 Guidance docs. ISCO Gen Permit Drft	DEC Electronic ELUR Application



Transformation 2013

- Transformation Report – February 2013
- RSR Wave 1 Amendments adopted June 2013
- RSR Guidance documents – November 2013
 - PMC Exemption if GW clean
 - Inaccessible Soil – fill under pavement
 - Incidental Sources
 - 95% UCL self-implementing
 - Technical Impracticability Fact Sheet



Transformation

RSR Wave 2 - Public Discussion Drafts

July 2013



Alternative GWPC
Areas



MNA (for Class C Exit)



Engineered Controls

November 2013



Institutional Controls



Sediment Ecological
Risk



Legislation 2013

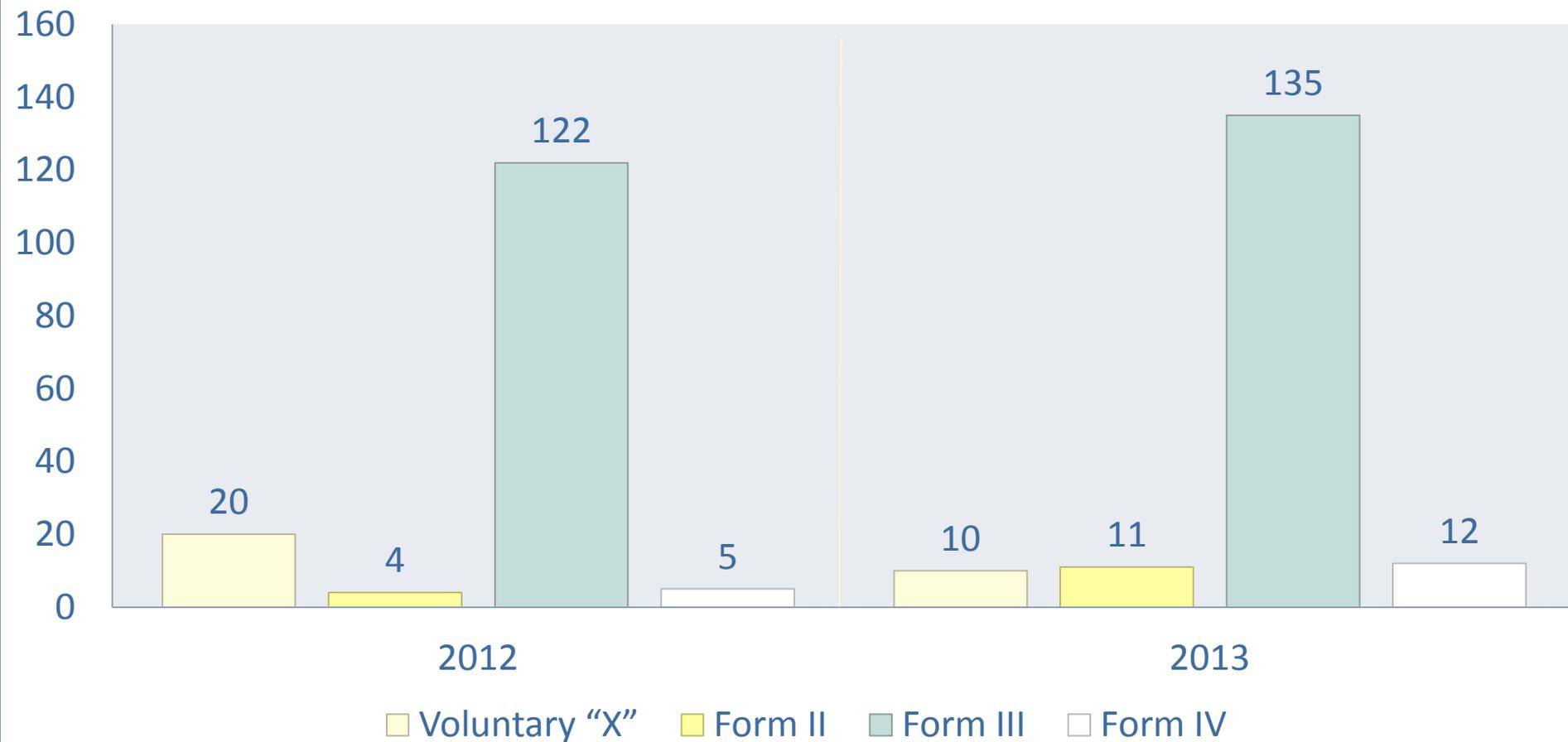
Bill 6651 – Governor signed into law – July

- Municipal Liability Protection at Brownfields
- Risk Assessment Evaluation
- SEHN Improvements (effective 2015)
- Deed Notice - new Institutional Control option (effective when Wave 2 regs get adopted)
- Reorganize DECD Brownfield grant and loan



Transfer Act & Voluntary Program

Transfer Act and Voluntary Program Filings



Verifications

2013

87 verifications

- 57 “No Audit” Letters
- 9 audited (5 of 9 rejected)
- 21 pending

2012

72 verifications

- 61 “No Audit” Letters
- 11 audited (4 of 11 rejected)



Other Site Progress, examples

Engineered Controls

	Submitted	Decided
2011	17 	17 
2012	21 	18 
2013	18 	8 

APS Determinations

	Requests	Decided
2012	181 	176 
2013	170 	160 



RCRA Corrective Action

RCRA Corrective Action - Fed FY 2013 Site Milestones Achieved



Lean Business Systems

- Remediation Division Eco/Sediment Peer Review team established
- Verification Form – revised October
- IT – Data Management upgrade in development
 - Electronic submittals, website access to info/docs
- RCPs for Air Phase petroleum hydrocarbons
- In-situ Chemical Oxidation, General Permit
 - Public notice published in November



ELURs 2013

June
ELUR
regulation
amendments

July
Transition
protocol on
website

November
ELUR
Application

- Lean
- Electronic
- Guidance

December
Drafted
“Temporary
Release”
template



ELURs 2013

Applications received (by mid Dec): 32

Applications acted upon by DEEP: 25

- 8 approved
- 15 comments issued to applicants to supplement
- 1 Notice of Administrative Deficiency
- 7 review pending
- 1st e-application rec'd in Nov, approved in 60 days



Significant Env Hazard Notification Program

Notifications received: 31

DEEP Acknowledgment Letters issued: 31

- 25 deemed under control or resolved
- 6 have work ongoing to confirm controlled status



UST Petroleum Cleanup Fund 2013

- Received \$9M in bond funds
- Analyzed cleanup work and claims for whole \$9M – all paid out on approved claims
- 301 claims reviewed and processed >\$15M
- Completed the 2nd reverse payment auction – July
 - 4 mid and large size applicants bid between .24 and .35 on the dollar and were paid



Potable Water 22a-471

- Zero \$ budget and statutory change to state subsidy of temporary filter/bottled water- June
- 235 transition letters sent to property owners w/property specific information and recommendations –July - August



Trainings Conducted/Presentations

Examples

- RSR Training courses – EPOC forum
- Public Health Directors – DPH forum
- ELUR – SWEP forum
- 1,4 dioxane – UMass Soils Conf
- Vapor intrusion – UMass “



The List Goes On

Including . . .

- Hundreds of site-specific cleanup actions overseen by Remediation Division staff . . .
- thousands by Emergency Response . . .
- thousands performed by you



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ROBERT BELL

2014

- More RSR Wave 2 Discussion Drafts
- Risk Evaluation
- GW Reclassification (GA/GB) Process
- Soil Reuse
- Spill Reporting
- ISCO General Permit
- TI Guidance
- Trainings: RSR course, ELUR course, RSR amdmts



Questions / Comments

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speak loudly.

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Transformation RSR Amendments

Wave 2- Recreational

Direct Exposure Criteria

JAN CZECZOTKA
ASSISTANT DIRECTOR
REMEDIATION DIVISION



Wave 2 RSR Amendments

- Goal of RSR amendments is to support the Transformation into forming ONE unified program
 - Remediation compliance from start to finish
 - Early Exits
 - Self-implementing options
 - Site-specific approaches
 - Institutional Controls
 - Tiered Exits A, B, C



Clean Up Transformation Roadmap



Wave 2 RSR Amendments

Discussion Documents Introduced May Roundtable

EARLY EXITS



- Develop framework for Early Exits

ALT GWPC



- Developing Map of GA Areas Where an Alternative GWPC is Potentially Eligible for Use
- Working with DPH on Alternative GWPC

ICs



- Create list of all current and new EUR types to categorize them into specific institutional controls
- Consult with DPH on any risk concerns with Institutional Controls



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JAN CZECZOTKA

Wave 2 RSR Amendments

Discussion Documents Introduced August Roundtable

ECs



- Developing self-implementing DEC options
- Soliciting ideas for self-implementing PMC options

MNA



- Developing concept for self-implementing MNA compliance point



Wave 2 RSR Amendments

Discussion Documents Introduced November Roundtable

PMC



Provide a self-implementing site-specific alternative

- Developing potential self-implementing options



- Developing a new section of the RSRs considering Transformation Workgroup's suggestions

SEDIMENT



Wave 2 RSR Amendments

Discussion Documents

Passive Recreation
Use



- Provide a new default category of DEC for passive recreation
 - Need for new Criteria
 - Requires EUR



Wave 2 RSR Amendments - DEC

- Purpose:

- Provide additional alternatives and increase flexibility
- Develop new category of direct exposure for addressing DEC exceedances
 - Self-implementing option
 - DEEP approval option



General Requirements and Limitations

Passive Recreation Use

- Lower exposure potential than residential use



Passive Recreational Use

- Intended for soils that are > residential but < Industrial/Commercial
- Allows for passive recreation such as walking, running, bird watching, etc but not earth intrusive activities such as planting a garden
- Will have specific criteria



Wave 2 RSR Amendments -DEC

- PCB's
 - Remain Regulated pursuant to TSCA
 - RSR options must be consistent with TSCA
- Criteria
 - Process will be pending the results of the risk evaluation outcome



MULTI-LEVEL EXIT CLASSES

C1/C2

- **Soil Cleanup Complete**
- Groundwater Remedy Operational
- **Long-term Maintenance**

DEC

B1/B2

- **Soil Cleanup Complete**
- Groundwater Cleanup Complete
- **Land-Use Controls**
- **Long-term Maintenance**

A

- **Soil Cleanup Complete**
- Groundwater Cleanup Complete
- **Unrestricted Reuse**

INCREASING LEVEL OF CLEANUP



Wave 2 RSR Amendments

Wave 2 Public Discussion Drafts

- Group 1 (August 2013)
 - Alternative GWPC Areas
 - Monitored Natural Attenuation
 - Engineered Controls
- Group 2 (November 2013)
 - Institutional Controls
 - Sediment



Wave 2 RSR Amendments

Wave 2 Public Discussion Drafts

- Group 3
 - Additional Exposure Category Criteria - Recreational Use
 - Alternative PMC - self-implementing
 - Early Exit – being led by Bureau of Materials Management and Compliance Assurance



Wave 2 RSR Amendments

Feed back to date = 4



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JAN CZECZOTKA

Wave 2 RSR Amendments

Feedback opportunities prior to formal
Public Hearing Draft:

- Information Sessions – TBA
- E-mailboxes for your feedback

DEEP.RemediationRoundtable@ct.gov

OR DEEP.cleanup.transform@ct.gov

[Draft Discussion Documents](#)



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JAN CZECZOTKA

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Revised Verification Forms and Verification Report Guidance Document

Claire Foster and Carl Gruszczak
Environmental Analysts
Remediation Division



Revised Verification Forms

- ✓ Form II
- ✓ Form III
- ✓ Form III - Interim
- ✓ Form III - Portion
- ✓ Form IV – Supporting
- ✓ 133x

CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION
Bureau of Water Protection and Land Reuse
Remediation Division

FORM III VERIFICATION (PROPERTY)

This verification must be signed by a Connecticut Licensed Environmental Professional and the Certifying Party. Print or type unless otherwise noted. Retain a copy for your records. (0322) USE ONLY VER

Part I: Site Information

Establishment now or formerly known as: _____
Establishment Address: _____
City/Town: _____ State: _____ Zip Code: _____
Described in the Tax Assessor's Office in the town of: _____
as lot _____ block _____ on map _____ Acreage of Establishment: _____

Part II: Verification

This verification pertains to the Form III filed with the Department on _____ and assigned Remed. # _____.

In accordance with CGS §22a-134a(n), 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 filed, whichever is later. Below, enter the date the Form III was filed, completion date of the Phase II, and the date this verification is rendered. Check the date to which this verification applies.

Date Form III was filed: _____ Date of this verification: _____
 Date of complete Phase II investigation: _____

Verify in accordance with Section 22a-134a(19) of the Connecticut General Statutes and Section 22a-133i-1(z) of the Regulations of Connecticut State Agencies (RCSA), that an investigation has been performed at the parcel in accordance with prevailing standards and guidelines, and that...

The establishment was in compliance with the remediation standards (RCSA Sections 22a-133k-1 through 22a-133k-5) at the time the Form III was filed or the completion of the Phase II investigation, or at the time of this verification, as indicated above, without requiring remediation.

All releases existing at the establishment at the time the Form III was filed or the completion of the Phase II investigation, or at the time of this verification, as indicated above, have been remediated in accordance with the remediation standards (RCSA Sections 22a-133k-1 through 22a-133k-5).

Signature of Licensed Environmental Professional: _____ License #: _____
Name of Licensed Environmental Professional (print or type): _____
Phone Number: _____

LEP Seal

Words: 4,643

➤ Form I and Final Form IV in queue



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CLAIRE FOSTER

Revised Verification Forms

Section 22a-155q-1.

LEP Seal

Signature of Licensed Environmental Professional License #:

Name of Licensed Environmental Professional (print or type)

Phone Number:



Revised Verification Forms

Part II: Verification

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

In accordance with CGS §22a-134a(n), 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 filed, whichever is later. Below, enter the date the Form III was filed, completion date of the Phase II, and the date this verification is rendered. Check the date to which this verification applies:

Date Form III was filed: [REDACTED]

Date of this verification: [REDACTED]

Date of complete Phase II Investigation: [REDACTED]



Revised Verification Forms

Part II: Verification

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

In accordance with CGS §22a-134a(n), 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 filed, whichever is later. Below, enter the date the Form III was filed, completion date of the Phase II, and the date this verification is rendered. Check the date to which this verification applies:

Date Form III was filed: [REDACTED]

Date of this verification: [REDACTED]

Date of complete Phase II Investigation: [REDACTED]



Revised Verification Forms

Part II: Verification

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

In accordance with CGS §22a-134a(n), 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 filed, whichever is later. Below, enter the date the Form III was filed, completion date of the Phase II, and the date this verification is rendered. **Check the date to which this verification applies:**

Date Form III was filed: []

Date of this verification: []

Date of complete Phase II Investigation: []



Revised Verification Forms

Rem#: [REDACTED]	
1 (A) and k-2(b)	Applicable Release Area (RA) ID #'s
a-133k-2(b)(1)	[REDACTED]
a-133k-2(b)(2)(A)	[REDACTED]



Revised Verification Forms

Interpretation Limited in Variance		22a-133k-2(f)(1)	
Engineered Control of Polluted Soil (Commissioner approval and ELUR has been recorded)		22a-133k-2(f)(2)	
<input type="checkbox"/>	Use of Engineered Control for DEC	...(B)(i)(I)	
	Approval date(s): <input type="text"/> <input type="text"/> <input type="text"/>	→ Copy(s) of Approval(s) must be attached	

- the dates of any Commissioner Approvals must be entered and a copy of the approval letter is to be attached to the Verification Form
- **Please attach only the Approval letter**



Revised Verification Forms

<input type="checkbox"/>	Polluted soils ≤ Industrial/Commercial (I/C) DEC (no PCBs and ELUR recorded)	22a-133k-2(b)(2)(A)	<input type="checkbox"/>
Date Certificate of Title for recordation of ELUR submitted to Commissioner: <input type="checkbox"/>			
→ Copy of Certificate of Title page (w/ volume, page, and date recorded) must be attached			
<input type="checkbox"/>	PCB polluted soil ≤ I/C DEC (certified asbestos not certified)		

- The date the ELUR was recorded on the land records must be entered and a copy of the Certificate of Title page is be attached to the Verification Form
- **Please attach only the C.O.T. page**



Revised Verification Forms – IV-s

<input type="checkbox"/>	Polluted soils ≤ Industrial/Commercial (I/C) DEC (no PCBs and ELUR required)	22a-133k-2(b)(2)(A)	<input type="checkbox"/>
<input type="checkbox"/>	ELUR pending → Copy of property owner's consent to record ELUR must be attached		
<input type="checkbox"/>	ELUR recorded Date Certificate of Title for recordation submitted to Commissioner: <input type="checkbox"/>		
→ Copy of Certificate of Title page (w/ volume, page, and date recorded) must be attached			

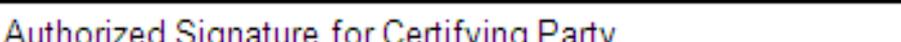
- If the recording of an ELUR is pending (under a Form IV scenario), we need documentation that the current property owner is on board



Revised Verification Forms

Part V: Certification

.....

	
Printed Name of Signatory for Certifying Party	Title
	
Authorized Signature for Certifying Party	Date

- the signatory for CP must be someone who has authority to legally bind the CP to contracts and agreements, etc..
- ❖ An employee with no management authority to bind the entity is not sufficient



Revised Verification Forms

Certifying Party:
Address:
City/Town: State: Zip Code:
Phone:
e-mail:

- Consistent addition in all Verification Forms
- ❖ Many times we contact LEP during Administrative Review or VR Screening. Need to be able to include CP in electronic correspondence



VERIFICATION REPORT

GUIDANCE DOCUMENT



August 1, 2008

Revised December 1, 2013

Daniel C. Esty, Commissioner

79 Elm Street, Hartford, CT 06106

www.ct.gov/deep/remediation

860/424-3705



Connecticut Department of Energy and Environmental Protection

CARL GRUSZCZAK

Biggest Changes

- ✓ Demonstration of Compliance checklist no longer necessary
- ✓ Elaborates on discussion of receptor surveys
- ✓ Key reporting requirements for specific types of verifications



Verifications

- ❑ There are Instruction Documents on the webpage for each type of Verification
- ❑ Most reporting requirements are generic for all types of Verifications
- ❑ There are specific reporting requirements for some types of verifications:
 - Interim Form III
 - Portion of Establishment (Form III)
 - Form IV
 - Supporting
 - Final
 - 22a-133x Release Area



Key Elements - Verification Report

- ✓ Intro
- ✓ Final CSM
- ✓ Receptors
- ✓ Remedial Actions
- ✓ Compliance Data validation
- ✓ Compliance

- ✓ References

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Introduction

- Purpose
- Type of verification and applicability of such
- Identifies CP / RP / Property owner / etc.
- Regulatory program under which the verification was rendered
- Identifies any previous verifications for the site and relevance



Conceptual Site Model

- It is not the purpose of the verification report to present all data and information that has been collected or generated
- Only ***relevant information*** necessary to support the LEP's final and validated CSM



Conceptual Site Model

the multitude of iterations of the CSM
or
the minutiae of the characterization process

The LEP's validated understanding of site conditions that are used to make decisions on the need for remediation



Receptor Assessments

- Discussion of the types of receptor surveys/assessments that were completed – and findings (sampling & conclusions)
- Rationale for identification of “at risk” receptors and measures taken to mitigate/abate exposure pathways
- If ecological receptor identified, discussion of the level of ecological risk assessment conducted



Receptor Assessments – SEHN

If a notification was submitted to DEEP for a Significant Environmental Hazard (SEH)

☐ SEH must be closed or mitigated prior to verification:

- **Closure** = hazard condition has been abated and **Certification of Closure** has been issued
- **Mitigated** = source of pollution and the groundwater plume have been remediated to applicable criteria, but traces of COC remain in private water supply well



Receptor Assessments – SEHN

SEH : Mitigated

Verification Report (VR) is to provide evidence that pollutant levels in the water supply well are, and are expected to remain, below applicable criteria

- Note: this is the only scenario in which mitigation is acceptable for verification instead of closure



Discussion of Remedial Actions

- Description of the remedial activities
- Approach and rationale
- Duration of remedial activities
- Date remediation was initiated and completed for each release area



Discussion of Remedial Actions

- Publication date and copy of the Public Notice of Remediation
- Confirmation sampling rationale
- Groundwater monitoring that demonstrates success
- Discussion on why remediation was considered complete



Laboratory Quality Assurance / Quality Control

- ❑ The VR is to include the findings of the data quality assessments and data usability evaluations for all data relied upon to demonstrate compliance



- ★ Including data quality assessment and data usability worksheets



Demonstration of Compliance

➤ Compliance data

➤ How the data was applied



Demonstration of Compliance

Discussion of:

- All provisions of the RSRs that were marked on the Verification Form
- How compliance data was used to apply the provisions
- Commissioner Approvals or notices
- Any engineered controls



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Demonstration of Compliance

Discussion of:

- Relevance and representativeness of the groundwater data
 - Approved and recorded ELUR, if applicable
- Visuals are always relevant:
maps, figures, and tables



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Verification Applicability

□ Applicability of verification

- Filing
- Phase II
- Date of verification

completion of Phase II Investigation, as defined in the Site Characterization Guidance Document, or from and after the date the Form III was filed, whichever is later. Below, enter the date the Form III was filed, completion date of the Phase II, and the date this verification is rendered. Check the date to which this verification applies:

Date Form III was filed: Date of this verification:
 Date of complete Phase II Investigation:

All releases subsequent to such declared date will not be closed with the verification



Verification Specifics

- Portion of Establishment
 - Must be clearly defined with an accurate survey
 - VR to include the survey and detailed discussion of the physical and environmental parameters of the 'Portion'



Verification Specifics

□ §22a-133x Release Area

- Fairly similar to a Portion verification, only the scale may be smaller.
- VR to include detailed mapping of the location of the Release Area and detailed discussion of the physical and environmental parameters of the 'Release Area'



Verification Specifics

□ Interim Form III

- VR to include dedicated section that identifies the groundwater remedy and discussion on why the selected remedy is appropriate for the environmental setting
- Other details of the remedy are required
 - Estimated duration
 - Operation and maintenance requirements
 - Monitoring plan
 - No exposure pathways to plume



Verification Specifics

- Supporting Form IV (MNA +/-or ELUR)
 - If MNA outstanding, same reporting requirements as for Interim Verification
 - If recording ELUR outstanding:
 - Type
 - Map of proposed 'Subject area(s)'
 - Applicability of ELUR
 - Schedule for implementation
 - Property owner approval



Verification Specifics

□ Final Form IV

- Verification focused on closure of Form IV filing
 - Natural attenuation of a groundwater plume has achieved compliance with applicable groundwater standards and/or
 - The intended ELUR (if applicable) has been recorded
- Does not have to recreate the level of documentation provided in the supporting Form IV verification report



Verification Report Guidance Document

Finally:

➤ Please submit only ONE (1) hard copy of the Verification Report.

- ❖ Space in the public file room is limited
- ❖ Reduces reporting costs



An additional copy of report(s) on CD is welcomed



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Questions / Comments
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Temporary Releases from ELURs with Pre-Approved Soil Management Plans

MARK LEWIS
ENVIRONMENTAL ANALYST 3
REMEDIATION DIVISION



Connecticut Department of Energy and Environmental Protection

Background

Owner and tenant concerns included:

- Leasing is competitive
- Prospective tenant may need to disturb polluted soil and engineered controls as part of move-in or operations
- Need a quicker way of obtaining a temporary release than current system allows



ELUR Releases

- Releases from ELURs are granted in writing by the Commissioner on a temporary or permanent basis, either in whole or in part
- ELURs can also be suspended in the event of an emergency per CGS §22a-134(o)(d)-self implementing



Solution

- For inaccessible and environmentally isolated polluted soil and polluted soil covered by an engineered control
 - Pre-approved temporary, conditional release of ELUR for future soil disturbance conducted pursuant to an approved Soil Management Plan & overseen by LEP
- Provision for emergencies in paragraph 4 of Declaration remains in full force



Temporary Conditional Release

- Provisions for a template for a standardized and site specific Soil Management Plan
- Conditional Release –
 - for activities conducted pursuant to the Soil Management Plan
 - Provides for conditions to ensure DEEP is aware of the activity, work is completed appropriately, and the results of the activity is documented



Conditions Included in the Temporary Conditional Release

- These conditions include:
 - Area of disturbance is restored to the original condition – method of compliance with RSRs does not change
 - “Release and Soil Management Plan” recorded on the land records prior to disturbance
 - DEEP notification prior to disturbance



Conditions Included in the Temporary Conditional Release (continued)

- These conditions include:
 - Standard Limits on work
 - Volume < 250 cubic yards
 - Area of disturbance < 500 square feet of Subject Area
 - Or other scope limit proposed by owner in application for DEEP approval
 - 45 day limit for duration of work with 45 day automatic extension
 - LEP oversight of preparation of Soil Management Plan, work and closure report



Conditions Included in the Temporary Conditional Release (continued)

- These conditions include:
 - Report describing activities and site restoration to be submitted to DEEP
 - Notification to DEEP if change of ownership
 - 5 year reporting requirement starting in 2015
 - Successor owner must register with DEEP to have prior approval effective for new owner



Conditions Included in the Temporary Conditional Release (continued)

- Revocation if approval conditions or Soil Management Plan not followed
- Commissioner authorized by owner to unilaterally record notice of revocation on land records



Questions / Comments
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speak loudly.

Submit comments to
DEEP.remediationroundtable@ct.gov

www.ct.gov/deep/remediationroundtable



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Groundwater Compliance

KEVIN NEARY
ENVIRONMENTAL ANALYST 3
REMEDIATION DIVISION



Connecticut Department of Energy and Environmental Protection

Applying Groundwater Criteria

- Groundwater monitoring shall be conducted for:
 - Any release area suspected to impact groundwater
 - If there is a release area there may be a groundwater plume
 - Any release area remediated
 - Any identified groundwater plume



22a-133k-3(g)

Connecticut Department of Energy and Environmental Protection

KEVIN NEARY

Applying Groundwater Criteria

- Appropriate criteria depends on:
 - Groundwater classification (GA or GB)
 - Surrounding groundwater usage
 - Ecological receptors
 - Presence of Volatiles
- Proper groundwater and soil characterization is necessary to apply appropriate criteria



22a-133k-3(g)

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KEVIN NEARY

Applying Groundwater Criteria

- Monitoring shall determine the **effectiveness of**
 - Any soil and groundwater remediation
 - Rendering soil environmentally isolated
 - Any actions required under a TI variance
 - Whether groundwater in GA meets background or GWPC as applicable
 - Whether groundwater in GB interferes with any existing use



22a-133k-3(g)(1)(A) - (F)

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Compliance Monitoring Occurs After

- **Characterization of the source is complete**
 - Full characterization is necessary to determine if remediation and/or compliance monitoring is necessary
- **Sample locations must also represent extent and degree of plume**
 - Representative sample locations are necessary to characterize plume and determine effectiveness of remediation



22a-133k-3(g)(2)(A)(i)

Connecticut Department of Energy and Environmental Protection

KEVIN NEARY

Compliance Monitoring Occurs

- **When all remedial actions have been completed**
 - Pertains to the specific release area(s) that act as the source of the groundwater plume in question
 - This includes all remedial effects of in situ treatments
 - If a site-wide clean up is the goal, or there is a commingled plume, site-wide groundwater monitoring can be performed
 - As long as wells are representative of all releases
 - All remedial actions for the site have been completed
 - **May occur prior to the conclusion of natural attenuation of groundwater or recording of an ELUR**



22a-133k-3(g)(2)(A)(i)

Connecticut Department of Energy and Environmental Protection

KEVIN NEARY

Compliance Monitoring Occurs After

- **Aquifer is no longer affected by withdrawal or injection**
 - Monitoring wells need to be properly located to detect groundwater conditions both before and after remediation
 - For in situ remedy there will typically be some period of time after the injection before the hydraulic head has stabilized
- **Geochemical changes from remediation have stabilized**
 - In order to evaluate the effects of the remediation baseline groundwater conditions must be determined prior to remediation



22a-133k-3(g)(2)(A)(i)

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KEVIN NEARY

Compliance Monitoring Occurs After

- Concentration is not increasing over time, except as a result of natural attenuation or seasonal variation
 - This requires knowledge of the groundwater flow direction and proper well screening to determine the three-dimensional extent of the plume
 - Multiple sampling events are needed to document steady state conditions
 - Increasing concentration cannot occur over time in any monitoring well representing the plume



22a-133k-3(g)(2)(A)(i)

Connecticut Department of Energy and Environmental Protection

KEVIN NEARY

DEC Compliance Monitoring Exemption

- Compliance monitoring is not required if remediation is solely to address DEC exceedances
- To demonstrate there is only a DEC exceedance a thorough CSM and groundwater characterization is needed to support:
 - That there is no PMC exceedance
 - Groundwater was not impacted by the release
 - No potential for residual contamination to exist below the water table
 - Nature of the release that caused DEC exceedance(s)
 - Remediation of DEC exceedance conducted should be completed

22a-133k-3(g)



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KEVIN NEARY

Compliance Monitoring

After groundwater has reached applicable compliance criteria:

- Compliance monitoring shall be a minimum of **four sampling events** on a quarterly basis **within two years**
 - 2 year clock starts after first compliance sampling round
 - Not necessarily consecutive, but representative of all four seasons
 - Allows for access or logistical issues
 - Does not prevent sampling for four quarters over a one year period

22a-133k-3(g)(2)(A)(ii) – (iii)



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KEVIN NEARY

Compliance Monitoring

- If during the first year of compliance monitoring there are exceedances of applicable criteria during one sample round, it may be acceptable to collect another sample during the same quarter the following year. If that sample and three other quarterly samples meet the applicable criteria, compliance monitoring **may** be complete



as long as:

22a-133k-3(g)(2)(A)(ii) – (iii)



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KEVIN NEARY

Compliance Monitoring

- The anomalous exceedance is not inconsistent with confirming the effectiveness of the remediation and can be explained through secondary lines of evidence
- The difference between the exceedance and the subsequent compliance round is not due to differences in water table elevation, and
- If compliance is sought for a site-wide closure the exceedance is not due to a new source area

22a-133k-3(g)(2)(A)(ii) – (iii)



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Monitoring Comparison

Old

Groundwater monitoring must determine effectiveness of remediation

Compliance Monitoring:

GA and GB: 1 year, 4 quarterly samples after remediation

Post-Remedial Monitoring

GA: 1 - 3 years depending on applicable criteria

GB: 1 year

New

Groundwater monitoring must determine effectiveness of remediation

Compliance with an applicable criteria shall be collected after: Remediation, Characterization and Stabilization

Compliance Monitoring:

GA and GB: 4 sample events within 2 years after remediation to show seasonal variability



Compliance Monitoring RECAP

- ✓ Need to characterize release and extent of plume
- ✓ Groundwater monitoring still needs to determine the effectiveness of remediation (except DEC)
- ✓ Remediation must be complete
- ✓ Groundwater stabilized prior to compliance monitoring
- ✓ Compliance monitoring is 4 quarters within 2 years of first compliance sample round
- ✓ Standardized “Post-Remedial” groundwater monitoring no longer required



SWPC Compliance

- Must meet all general compliance requirements
 - All remediation complete
 - Plume reached steady state conditions
- The applicable SWPC has been met for 4 quarters within 2 years of first compliance sample round
- Using one of the following means of compliance
 - 95% UCL of all representative sample results (REPLACED AVERAGING)
 - Groundwater concentration immediately upgradient of the surface-water discharge location

22a-133k-3(g)(2)(C)(i)



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Volatilization Criteria Compliance

- Must meet all general compliance requirements
 - All remediation complete
 - Plume reached steady state conditions
- The applicable volatilization criteria has been met for 4 quarters within 2 years
- 95% UCL – no longer applicable for Volatilization Criteria



Questions / Comments
Please state your name and
speak loudly.

Submit comments to
DEEP.remediationroundtable@ct.gov

www.ct.gov/deep/remediationroundtable



Connecticut Department of Energy and Environmental Protection

General Permit for In Situ Remediation: Chemical Oxidation

KEN FEATHERS
SUPERVISING SANITARY ENGINEER
REMEDIATION DIVISION



Connecticut Department of Energy and Environmental Protection

General Permit – ISCO

Issued
pending

DEEP web site
permit
fact sheet
registration form
instructions
monitoring form



79 Elm Street • Hartford, CT 06106-5127

www.ct.gov/deep

Affirmative Action/Equal Opportunity Employer

General Permit for In Situ Remediation: Chemical Oxidation

Issuance Date:
Expiration Date:

DRAFT

Bureau of Water Protection and Land Reuse
Remediation Division

860-424-3705

Printed on recycled paper

DEP-REM-GP-002

revised 8/22/13



Connecticut Department of Energy and Environmental Protection

KEN FEATHERS

In Situ Chemical Oxidation (ISCO)

- Addition of chemical oxidants to soil and groundwater to chemically destroy polluting organic materials or chemically stabilize polluting inorganic materials; without removal of the polluted soil itself.



General Permit – ISCO

Overview of Permit
Authority 22a-430
Definitions
many by reference
Authorization
Registration
Conditions

General Permit for In Situ Remediation: Chemical Oxidation Table of Contents

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DEP-REM-GP-002

revised 8/22/13



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ISCO GP §3(a) – Technologies

- Covers all oxidants in general use
 - Ozone
 - Peroxide
 - Permanganate
 - Persulfate
 - Percarbonate
- Also other oxidants with approval
- Appendix for chemical specific requirements



ISCO GP §3(a) – Scope

- Covers treatment of most major pollutants
 - Fuels (§1 & §2)
 - Solvents (§3)
 - Other pollutants amenable to ISCO (§4)
- Allows various means of oxidant delivery
- Flexibility in project schedule



ISCO GP §3(e) – Authorization

- Initial activity phase authorized by two paths
- Approval of Registration (§1)
 - Full technical review by DEEP
- Certificate of Coverage (§2)
 - Technical screening review by DEEP
 - Founded on design certification by LEP/PE



ISCO GP §3(e)(1) – Approval Required

- Sites near Public Water Supplies
- Sites near sensitive receptors
 - Vicinity: NDDDB, coastal zone, private wells
 - Site: water resources, infrastructure
- Use of complex or aggressive technologies
 - Active controls on GW/vapor
 - High oxidant activity
 - Aggressive contact (fracking, surfactants)



ISCO GP §3(e) – Additional Phases

- Authorization of additional phases (§4) depends on initial authorization mode and nature of proposed additional activity
- If no change to work plan: self-implementing after advance notification to DEEP
- If increase in amount or area of activity: DEEP review and approval of modified work plan
- Requires review of CSM and prior phase implementation



ISCO GP §4(c) – Registration

- Registration Form
 - Summary of project
- Supporting Documents
 - Site Conditions
 - Site Map
 - Work Plan
 - Monitoring Plan
- LEP/PE /SCO certification



Connecticut Department of
Energy & Environmental Protection
Bureau of Water Protection & Land Reuse
Remediation Division

Registration Form General Permit For In Situ Remediation: Chemical Oxidation

CPPU USE ONLY	
App #:	_____
Doc #:	_____
Check #:	_____
Program:	Remediation Groundwater Discharge

Part I: Application Information: Please complete this form in accordance with the instructions (DEEP-REM-GWP-INS-600) to ensure the proper handling of your registration. Print or type unless otherwise noted. You must submit the application fee along with this form.

DEEP REMEDIATION USE ONLY	
This registration is for a (check all that apply): <input type="checkbox"/> New general permit registration [rev id] and <input type="checkbox"/> Replacement of an individual permit or an authorization <input type="checkbox"/> Renewal of an existing registration [rev id] <input type="checkbox"/> new ownership <input type="checkbox"/> A modification of an existing registration [rev id] For renewals or modifications: 1. Existing permit or authorization number: 2. Facility ID number: 3. Expiration Date: _____	RemGIS RemID <input type="checkbox"/> scanned
D. City or Town where site is located: _____	
E. Brief Description of Project: _____	

Part II: Fee Information: The registration will not be processed without the fee. The fee shall be non-refundable and shall be paid by check or money order to the Department of Energy and Environmental Protection.

The Base Fee is \$500. There is no charge for modifications. FEE ENCLOSED \$ _____	A 50% discount applies if the applicant is a municipality: <input type="checkbox"/> Municipality Reduction Taken (CGS 22a-8(b)) Single family residence homeowners may request a waiver of the fee, even if they are not a registrant: <input type="checkbox"/> Single Family Residence Waiver* (Complete signature box below)
<input type="checkbox"/> I am the owner of a single family residence which is the location where the pollution that is to be remediated originates, and I request a fee waiver. _____ Homeowner's Signature	

DEEP-REM-GWP-APP-600

1 of 20

7840810268FT 02/2015



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ISCO GP §5(a) – Conditions

- Operating conditions
 - LEP/PE oversight
 - Owner permission
 - Abutter and local official notification
 - Appropriate & necessary for Remediation
 - Product removal precedes ISCO use
 - Implementation path for additional phases
 - Discharge limits



ISCO GP §5(a)(11) – Prohibitions

- Prohibitions intended to:
 - Establish performance/design requirements
 - Ensure Safety
 - Protect Environmental Receptors
 - Define threshold levels for PCBs excluded from GP
 - Ensure integrity of **Zone of Influence (ZOI)**
- Define “Approval Required” activity



ISCO GP §5(b) – Monitoring

- Objectives – support permit implementation
 - Verify Receptors protected, esp. wells
 - Verify Zone of Influence is correct
 - Ensure Process safety (not = effectiveness)
- Specifics provide flexibility
 - Some exemptions provided
 - Varying frequency
 - Field parameter focus
 - Analyses can be subset of constituents of concern
 - **Continues until RSR criteria are met** for discharge



ISCO GP §5(c) – Reporting

- Reports
 - Active phase implementation report
 - Monitoring activity (summary, future e-form)
 - Final report
- Reports may be deferred at remediation sites and included with remediation documentation
- Reports may be on file with consultant not site
- Retention ends when submitted to DEEP



ISCO GP §5(d) – Notifications

- Notification to DEEP of
 - Receptor impact of discharge documented
 - Impact of discharge outside Zone of Influence
 - Discharge limits exceeded
 - Operational contingencies implemented
- Response implementation required
 - Work plan defines response actions
 - Stop the continuing effect
 - Submit plan to evaluate and mitigate effects



ISCO GP – Appendix

- Chemical specific requirements in appendix
 - Generic chemicals
 - Includes ancillary chemicals
- Appendix elements
 - Substance and applicability
 - Characterization
 - Design and operation
 - Limits
 - Monitoring



ISCO GP – Other

- Additional Conditions [GP §5 (e) & (f)]
 - No assurance of remedial success
 - No product endorsement
- General Conditions [GP §6 & 7]
 - Various best management practices
 - **Well abandonment** when no longer needed
 - Regulatory incorporation
 - Duties, submittals and certifications
 - Administrative and legal



Questions / Comments

Please state your name and
speak loudly.

For more information on the GP contact
Ken Feathers: Supervising Sanitary Engineer
kenneth.feathers@ct.gov or 860-424-3770 or

Submit comments to

DEEP.remediationroundtable@ct.gov



Thank you!

Next meeting: May 13, 2014

Schedule and agenda on website

www.ct.gov/deep/remediationroundtable

Submit comments to the Roundtable
Committee at

DEEP.remедiationroundtable@ct.gov



Connecticut Department of Energy and Environmental Protection