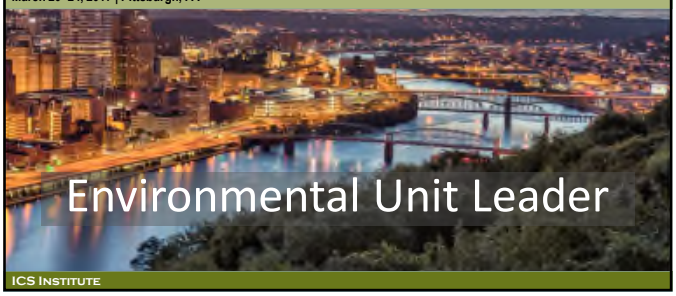
EPA ICS INSTITUTE
Incident Command System
March 20–24, 2017 | Pittsburgh, PA



Environmental Unit Leader

ICS INSTITUTE

ENVL

In consideration of your fellow students and the instructors, please silence all cell phones

Environmental Unit Leader

Pittsburgh, PA
March 21 – 23, 2017

ICS INSTITUTE EPA 2

ENVL

Unit 0

Introduction

ICS INSTITUTE EPA 3

Purpose of the Course

ENVL

Provide training to agency personnel to develop the skills necessary to perform as an Environmental Unit Leader on an Incident Management Team.

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Instructor Introduction

ENVL

- Name / job title / Region / Special Team
- Years of ENVL-related experience?
- Recent or major incident involvement?

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Administration

ENVL

- Student Registration Card
- Student Evaluation Form
- Course Agenda
- Student Manual – available for download
- Student Handouts

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Facility Information

ENVL

- Parking
- Classroom
- Restrooms
- Water fountains, snacks, refreshments
- Lunch
- Emergency telephone numbers
- Alarms and emergency exits

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Student Introductions

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- State your name
- Provide a brief explanation of what do you normally do (title)
- Tell us where you are from (company, town, etc.)
- Describe previous ICS experience, if any (for example, were you a participant in the Shuttle Response, WTC, Capitol Hill Anthrax, Katrina/Rita, BP Spill Response, Enbridge, or other?)

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Course Objectives

ENVL

1. Understand the management and leadership function of the Environmental Unit Leader (ENVL)
2. Define the interactions of the ENVL with other functional positions in the Incident Management Team (IMT)
3. Understand how and when to incorporate multiple agency expertise into the ENV of the Planning Section

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Course Objectives (continued)

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4. Understand how environmental data from an incident is managed by the ENV and Situation Unit of an EPA IMT
5. Understand the capability and/or limitations of numerical models and software products, which are used as tools to support ENV operations during a response

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Course Certificate

ENVL

- Attendance is mandatory
- Must participate satisfactorily in final exercise

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Resources

ENVL

- response.epa.gov/institute
- response.epa.gov/ENVL2016
- response.epa.gov/envunit
- NIT Representative – JoAnn Eskelsen, ERT

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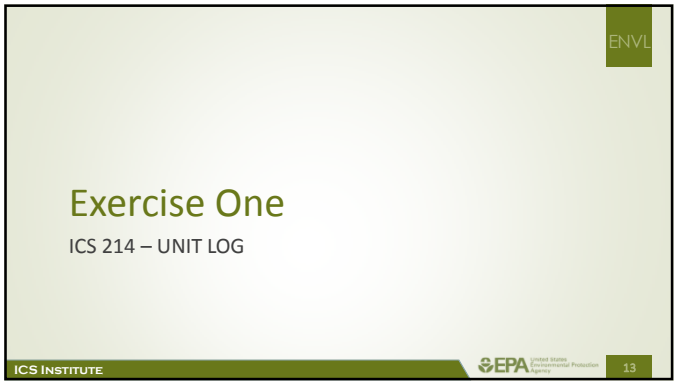
ENVL
Exercise One
ICS 214 – UNIT LOG
ICS INSTITUTE
EPA
13

ENVL

Environmental Unit Leader
Unit 1

Mission, Key Responsibilities and Management of Unit

Unit Objectives

ENVL

- State the mission of the EPA Environmental Unit (EU)
- Discuss the primary responsibilities of the EU and the Environmental Unit Leader (ENVL)
- Understand the role of the EU in the IMT and the Planning Cycle
- Understand how to effectively mobilize, and then integrate into the IMT.

Unit Objectives

ENVL

- Know what information the ENVL should obtain from incoming briefings
- Know what and where resources are available and the ordering process.
- Understand the organization of the EU.
- Understand the role of the EU in data management

Unit Objectives

ENVL

- Know the function of a Technical Working Group (TWG) and an Environmental Clearance Committee (ECC)
- Understand the guidelines for successful operation of the EU
- Understand the content of the EPA ENVL Job Aid and how to apply it to a future assignment as an ENVL

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NIMS

ENVL

- The environmental unit would prepare environmental data for the Situation Unit and work in close coordination with other units and sections within the ICS structure to enable effective decision support to the IC or UC.

Homeland Security

Source: Page 105 NIMS Dec 2008 ver.

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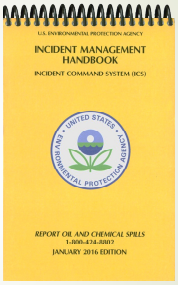
EPA ENVL

ENVL

- Incident Management Handbook (IMH)
- EPA ENVL Job Aid



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Environmental Unit Mission Statement

ENVL

- The Environmental Unit of the Planning Section is established to promote the use of science and engineering principles to support response decisions

Source: EPA ENVL Job Aid Jan 2011

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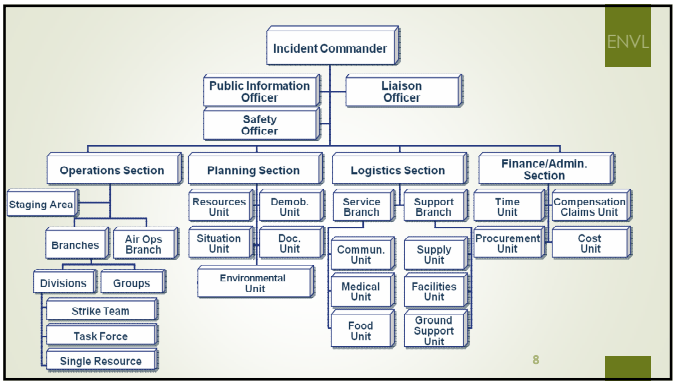

Environmental Unit Responsibilities

ENVL

- The Environmental Unit is responsible for scientific support associated with a response, including the following:
  - Support for response approaches including technologies;
  - Modeling and data interpretation;
  - Natural resources and ecological issues;
  - Establishment of standard methods and permitting issues;
  - Sampling and Analysis Plans; and
  - Quality Assurance and Control Plans
  - IMH p 6-2

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Additional Responsibilities of the EU

ENVL

- Recommendations regarding the protection of public health, welfare, and the environment
- Developing plans to assess conditions and impacts
- Evaluating data for usability
- Using models relevant to the incident
- Performing risk assessments
- Assessing the environmental conditions and impacts.

IMH p 6-4

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ENVL Position Duties

ENVL

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Common Responsibilities

ENVL

- There are many responsibilities that are common to all personnel.

Found on page 3-1 Of EPA IMH.

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Common Unit Leader Responsibilities

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- There are many responsibilities that are common to all Unit Leaders.

Found on page 3-3 Of EPA IMH.

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Environmental Unit Leader Duties

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- Environmental Matters
  - Assessment
  - Environmental monitoring
  - Site characterization
  - Waste characterization
  - Sample data
  - Site clearance
- Coordination with other offices on permitting

EPA IMH p 9-10

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ENVL Duties cont.

ENVL

- Determine staffing requirements – organize unit
- Conduct EU staff meetings
- Make recommendations regarding the protection of public health, welfare, and the environment
- Coordinate with HQ and regional Eus
- Coordinate with SSC and TWG

pp 9-11&12 of 2016 of EPA IMH

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ENVL Duties cont.

ENVL

- Coordinate with LNO on Natural, Cultural and Historical resources
- Provide technical advice and consultation
- Prepare Environmental Data presentations & packages
- Coordinate with PIO on drafting public messages
- Document activities
- Monitor Unit status -order and demob resources as needed
- Keep PSC apprised of work status

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Role of ENVL in Planning Cycle

ENVL

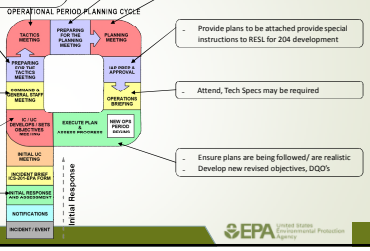
- Attend Tactics Meeting
- Ensure proposed tactics can be supported by current plans.
- Determine new plan needed for future tactics
- Coordinate with PSC and OPS during Tactics meeting: provide key info to OPS/PSC to help develop 204s (Treatment Recommendations, Safety Constraints, and Sampling Methods. Etc..

- Plan development
- Data interpretation
- Coordinate with SCAT, OPS and PSC

- Attend as an observer if requested
- Determine any relevant/new information or shift in Objectives/Priorities/action items that might affect the Unit

- Prepare PSC with draft objectives on sampling/data to present
- Prepare DQO's based on objectives set by IC/UC

- Briefings
- Resource needs
- Organizational Structure



- Provides special instructions to RESL for 204 development
- Attend, Tech Specs may be required
- Provide plans to be attached provide special instructions to RESL for 204 development
- Attend, Tech Specs may be required
- Ensure plans are being followed/ are realistic
- Develop new revised objectives, DQO's

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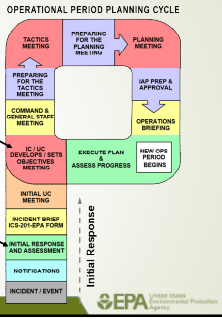

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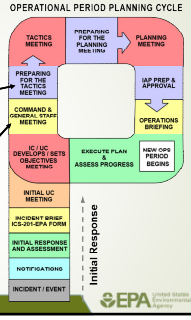

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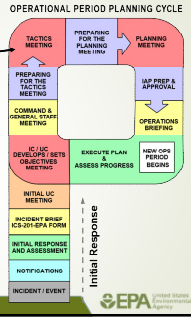
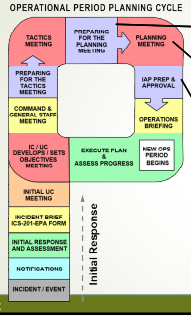


Role of ENVL in Planning Cycle

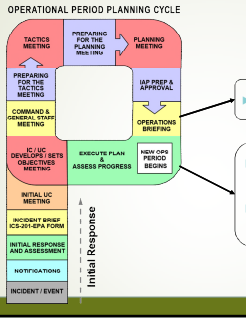
ENVL



- Provides special instructions to RESL for 204 development..
- Attend, Tech Specs may be required
- Provide plans to be attached, provide special instructions to RESL for 204 development

Role of ENVL in Planning Cycle

ENVL



- Attend, Tech Specs may be required
- Ensure plans are being followed/ are realistic
- Develop new revised objectives, DQO's

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ENVL - Arrival On Site

ENVL

- Check-in with Resources
- Meet with Planning Section Chief
- If rotation, meet with current ENVL
- Meet with ENV personnel
- Meet with SIT, OPS, TWG etc.
- Survey current incident status
- Survey anticipated scientific needs

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Check-In

ENVL

- With Check-in Status Recorder or Resource Unit Leader
- Get assignment
- Get information on other steps in check-in process
  - Housing & Meals
  - Safety
  - Facilities & Supplies

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Initial Briefing From PSC

ENVL

- Incident size, scope & potential
- Political & Public interest
- Expectations and Assignments
- Assigned resources

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Initial Briefing From PSC

ENVL

- Plans- In Place and To be developed
- Timelines & priorities
- ENV role in Data Management Plan
- TWGs/ECCs and Stakeholder Groups
- Logistical considerations/facilities

Obtain copies of Incident Action Plan (IAP), 201s, and SITREPs. Review Unit's daily logs.

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Briefing from existing ENVL

ENVL

- Review ongoing ENV Responsibilities
- Discuss ENV Personnel roles
- Discuss ENV Staffing & Organization
- Review Schedules
- Obtain a list of Assignments & Products
- Interactions – Internal & External

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Meet with ENV personnel

ENVL

- Ongoing projects
- Projections
- Skills
- Roles & Responsibilities
- Is organization working?
- Workload/Burnout
- Demob plans
- H&S certification

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Survey Current Incident Status

ENVL

- Size/Scope
- Current Activities
- Contaminants of Concern
- Threats
- Sensitive Areas

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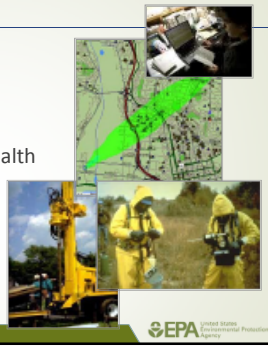
Survey Anticipated Scientific Needs

ENVL

- Modeling
- Interpretation
- Threats/Risks to human health and environment
- Sampling
- Response



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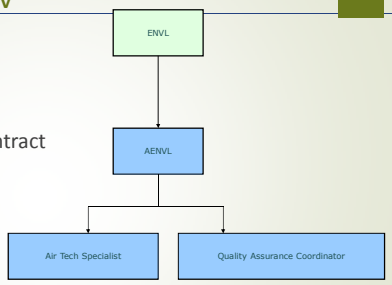
Organizing the ENV

ENVL

- Span of control
- Based on function
- Can expand and contract based on:
  - Size of response
  - Nature of response
  - Stage of response



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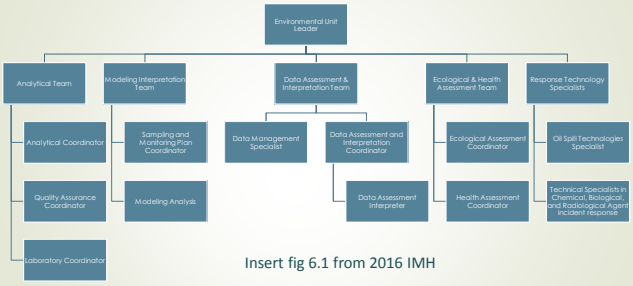
Sample ENV Organization

ENVL



Insert fig 6.1 from 2016 IMH

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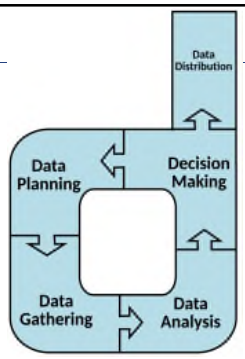
Data Flow

ENVL



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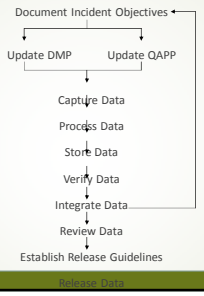
Emergency Response Data Management Sub-Functions

ENVL



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Possible Data positions in ENVL

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- Analytical Coordinator
- Sampling and Monitoring Plan Coordinator
- Quality Assurance Coordinator
- Data Assessment and Interpretation Coordinator

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ENV Role in Data Flow

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- Decision Making – provide technical advice as requested.
- Data Planning –Develop and update QAPP and DQOs
- Data Gathering- serve as a coordination point for analytical & monitoring data
- Data Analysis – verify & review
- Data Distribution – assist PIO in messaging based on data

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Headquarters EU

ENVL

- Established during a Nationally Significant Incident.
- Provides additional data quality control, review, interpretation & release
- Conducts external coordination with national political leadership and other agencies
- Conducts internal coordination with other EPA offices, including Public Affairs

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ENV Role in Crisis Communication Plan(CCP)

ENVL

- CCP mainly for large events will affect HQ ENV
- CCP has key communication considerations – Environmental Data
- Environmental Data disseminated to public in an understandable, timely, accurate, and consistent manner.
- ENV work with PIO to ensure public messages meet these criteria

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Technical Working Group

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- A TWG is a highly recommended group of individuals with specific needed expertise from various agencies/stakeholders that work on topics of importance determined by IC/UC in consultation with the Operations Section Chief, and/or Planning Section Chief

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TWG Primary Goals

ENVL

- Provide advisory subject-matter expert (SME) input to the IC/UC to minimize risk while protecting human health and the environment
- Assist by providing technical information needed by IC/UC to explain human health and welfare or environmental impacts to the public, stakeholders, and the media
- ***A TWG is a technical advisory group, not a decision-making body***

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TWG Structure and Process

ENVL

- TWG may consist of multiple subgroups, each having a particular focus area:
  - Sampling (Sampling and Analysis Plans)
  - Decontamination
  - Waste management
  - Interpretation of analytical data, etc.
- When possible, personnel should not be involved in any other role in the IC/UC, including field operations

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Example of a TWG in Incident Command

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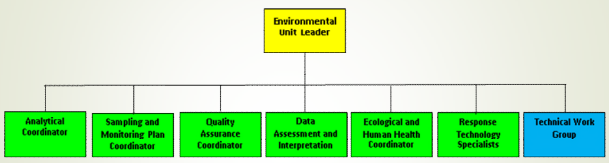

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Environmental Clearance Committee

ENVL

The ECC is a recommended, but optional, **independent, objective and unbiased** scientific peer review body that exists to evaluate the effectiveness of response activities in order to make recommendations to the IC/UC on re-occupancy of properties.

- ***NONE*** *of the ECC members should be working elsewhere in the ICS Structure.*
- *ECC members should represent their individual scientific disciplines or areas of expertise, not their agencies.*

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ECC

ENVL

- Coordinated group of scientists with expertise in disciplines relevant to the assessment and cleanup of the facilities to serve on a committee charged with evaluating the effectiveness of the facility decontamination measures
- Provide additional credibility/confidence to the IC/UC by making a determination that clearance goals have/have not been achieved in a response
- ECC is not a decision-making entity, nor will ECC advise on public policy and management issues
- For each incident, the ECC makes a recommendation on the appropriateness of reopening the affected facilities for re-occupancy (i.e., clearance)
- *The lead local department of public health will have the final decision-making authority on re-occupancy of the properties in the affected region within its jurisdiction*

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Example of an Environmental Clearance Committee in Incident Command

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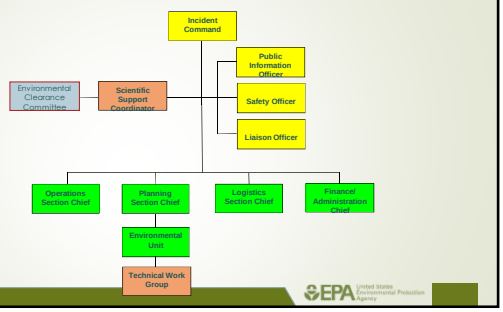

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Resources

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- Reach back/Onsite
- Regional Response Center (RRC)
- EPA Response Support Corps (RSC)
- Other Offices & Regions
- EPA Special Teams
- HQ
- State/Local and other federal agencies
- Private/Academia

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Resource Consideration

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- Lag/Travel time
- Shifts and hours
- Number of tours of duty
- Contractors/COR responsibilities
- Reach back vs. onsite
- H&S requirements

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Ordering/Demobilization

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- Ensure that resources are ordered
- Re-evaluate staffing load of Unit
- Balance technical needs of incident with staff needs of Unit
- Develop demobilization strategy early

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Requesting Resources

ENVL

- ICS 213 RR Resource Request
  - List Item/Position
  - Time needed
  - Location
- PSC approval
- Check with RESL
- Submit request to Ordering Manager (LOGS)
- FOLLOW UP on request!

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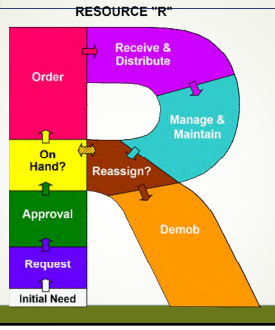
Resource R

ENVL



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Incoming Personnel

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- Assign personnel based on
  - Expertise
  - Training
  - Experience
- Briefing
  - Incident Status & Objectives
  - IAP & IMT Organization
  - Role of ENV

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Managing the ENV

ENVL

- Define priorities, goals and objectives
- Establish realistic timelines
- Reinforce the incident objectives
- Ensure everyone understands their responsibilities
- Monitor Unit personnel and performance

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Managing the Unit

ENVL

- Get the appropriate Technical Specialists
- Thoroughly brief personnel
- Schedule incoming personnel
- Demobilize personnel
- Solicit feedback
- Keep everyone informed

COMMUNICATE

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Guidelines for Successful Unit Operations

ENVL

- Consider working conditions
- Coordinate with Operations
  - Eliminate duplication of effort
- Advise personnel on what requires Environmental Unit Leader approval
- Get the right resource, in the right place, at the right time

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Communicate with IMT

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It is key to have
Open Communication
with all members of the IMT.

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Review Job Aid

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Summary

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- Know your role
- Get the right expertise
- Delegate
- Set priorities & time lines
- Brief incoming personnel
- Demobilize personnel
- COMMUNICATE!

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ENVL

Unit 2

The Role of the ENVL at the Enbridge/Marshall Oil Spill A Case Study

ICS Institute EPA 1

ENVL

Objectives

- Provide a real life example of the role of the Environmental Unit Leader.
- Demonstrate that the role of the ENVL can be multifaceted even on one event.
- Demonstrate how the role of the ENVL can change over time at an event.

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The Event

- July 25, 2010 – a release from the Enbridge Pipeline at Marshall, MI
- 819,000 gallons reported spilled
- Heavy crude oil/tar sands blended with diluents
- Occurred during a flood event
- Unreported for over 17 hours
- Into Talmadge Creek then into the Kalamazoo River

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Immediate Effects

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- Diluent volatilized – resulting in evacuation of residents
- All downstream 2.2 miles of Talmadge creek
- Oil migrated down 40 miles of Kalamazoo river
- Oil trapped in overbank, wetlands and flood plains when flood receded
- Oil eventually submerged and settled in Kalamazoo river

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Initial Response

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- Hindered by flooding conditions
- Focused on Benzene in air/public health
  - > 200 residents evacuated
  - >97,000 monitoring data points
  - >6,500 samples
- Containment and Recovery
  - Excavation
  - Vacuum removal
  - Absorbent Materials

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Overall Response

ENVL

- On the top of ongoing Deep Water Horizon (BP) response
- July 26, 2010 – November 18, 2014
- 40 miles of contaminated riverine and overbank environments
- 766,228 gallons of oil recovered from surface water
- 435,000 gallons of oil recovered from other sources
- Several science-based studies
  - Counter measures
  - Geomorphology of river
  - Re-suspension and biodegradation of submerged oil

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Purpose of Environmental Unit

ENVL

The purpose of the Environmental Unit within the Planning Section was to provide scientific support to the FOSC throughout the response .

Source: FOSC report

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Role of EU and ENVL

ENVL

- Varied over time based on needs of response and issues and events that occurred
- Strong association with Operations
- Included a counter measures group
- Liaison with multiple agencies – Environmental Advisory Group
- Eventually Environmental Advisory Group expanded into "Scientific Support Coordination Group" which replaced the EU
- Three General Phases

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ENV in Initial Response Phase

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July/Aug 2010

- Air/Public Health Issues
- Special Projects – Liaison with Ops
- Environmental Advisory Group established (EAG)
- SCAT/ENV coordination to set up process and Shoreland Treatment Recommendations (STRs)
- Began evaluating Countermeasures
- Establish Data Flow
- OIL migration assessment
- QAPPs and data review

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ENV in Intermediate Phase

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- Fall of 2010
- SCAT and data evaluation continues
- Clean up of Overbank areas, pooled and stranded oil
- Counter measures evaluations continue
- Evaluation of Submerged Oil and Sensitive Ecosystems – with OPS
- Liaison between OPS and EAG
- Special Projects

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ENV in Long Term phase

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- Winter of 2010/11 through November 2014
- Environmental Advisory Group → Scientific Support coordination Group - More like multiple research Projects
- "Micro cleanups"

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Initial Response Phase

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Air/Public Health Issues

ENVL

- Health agencies from County, State and Federal
  - Ultimately became the Public Health Unit
- Identify chemicals of concern
- Establish air monitoring program for work zones and community
  - Secondary release points
- Develop action levels/decision criteria
  - Evolved as response moved from Initial -> Intermediate -> Long-term Phase
    - ✓ 9,000 ppb to 3 ppb
  - Account for limitations on instrumentation
- ID & mobilize appropriate resources & instrumentation

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Instrumentation

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ICS Institute EPA 14

Total VOC Concentrations Using Real-Time Monitors

ENVL

Time Frame	Area	Number of Measurements	Range of Detections (ppb)
Initial Response (July 26-28, 2010)	Voluntary Evacuation Area	92	ND to 120,000
	Squaw Creek Subdivision	30	ND to 71,600
	Ceresco Area	8	ND to 6,000
	Baker Estates Neighborhood	2	ND
Evacuation Period (July 29 to August 17, 2010)	Voluntary Evacuation Area	2,164	ND to 568,000
	Squaw Creek Subdivision	623	ND to 2,600
	Ceresco Area	431	ND to 3,000
	Baker Estates Neighborhood	511	ND to 266,000
Post Evacuation Period (August 18 to December 31, 2010)	Voluntary Evacuation Area	4,278	ND to 9,000
	Squaw Creek Subdivision	1,058	ND to 1,200
	Ceresco Area	5,148	ND to 2,800
	Baker Estates Neighborhood	767	ND to 1,200
2011	Voluntary Evacuation Area	1,377	ND
	Squaw Creek Subdivision	508	ND
	Ceresco Area	785	ND
	Baker Estates Neighborhood	465	ND

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Benzene Colorimetric Tube Measurements

ENVL

Time Frame	Area	Number of Measurements	Range of Detections (ppb)
Initial Response	Voluntary Evacuation Area	16	ND to 10,000
	Squaw Creek Subdivision	6	ND to 500
	Ceresco Area	3	ND to 250
	Baker Estates Neighborhood	2	ND
Evacuation Period	Voluntary Evacuation Area	57	ND to 500
	Squaw Creek Subdivision	10	ND
	Ceresco Area	26	ND to 100
	Baker Estates Neighborhood	15	ND
Post Evacuation Period	Voluntary Evacuation Area	28	ND
	Squaw Creek Subdivision	10	ND
	Ceresco Area	30	ND
	Baker Estates Neighborhood	21	ND
2011	Voluntary Evacuation Area	40	ND
	Squaw Creek Subdivision	5	ND
	Ceresco Area	7	ND
	Baker Estates Neighborhood	1	ND

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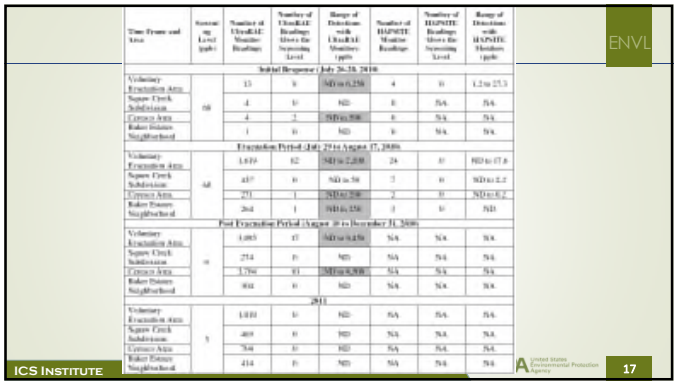

ENVL

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Health-Based and Worker Screening Levels - Benzene

ENVL

- 9,000 ppb 8-Hour AEGL (1-Hour AEGL = 52 ppm)
- 1,000 ppb OSHA Permissible Exposure Limit
- 500 ppb MIOSHA Permissible Exposure Limit
- 9 ppb ATSDR Acute MRL
- 6 ppb ATSDR Intermediate MRL
- 3 ppb ATSDR Chronic MRL

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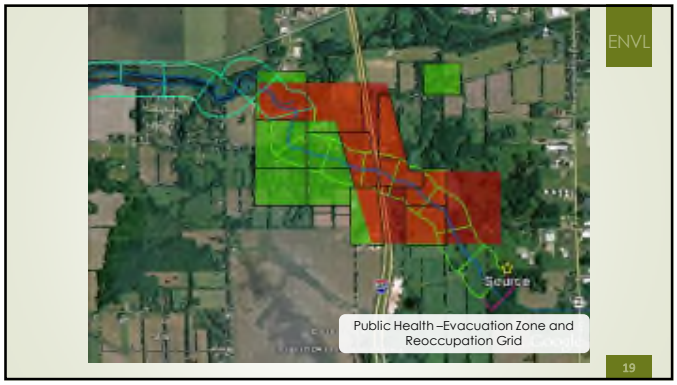
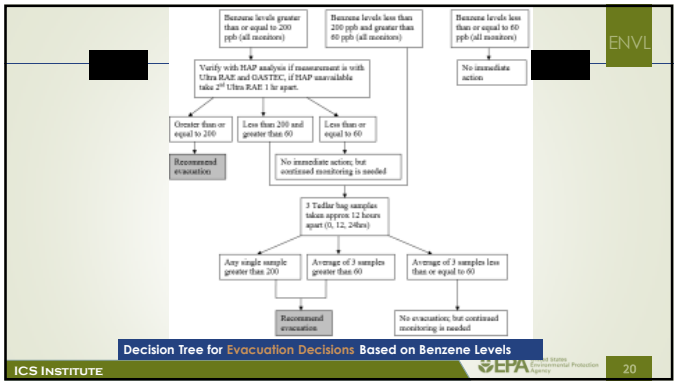
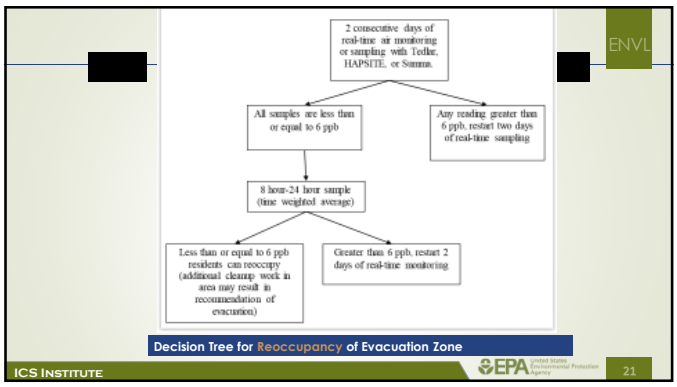

ENVL
Source
Public Health –Evacuation Zone and Reoccupation Grid
19


ENVL
Benzene levels greater than or equal to 200 ppb (all monitors)
Benzene levels less than 200 ppb and greater than 60 ppb (all monitors)
Benzene levels less than or equal to 60 ppb (all monitors)
Verify with HAP analysis if measurement is with Ultra RAE and GASTEC, if HAP unavailable take 2nd Ultra RAE 1 hr apart.
No immediate action
Greater than or equal to 200
Less than 200 and greater than 60
Less than or equal to 60
Recommend evacuation
No immediate action; but continued monitoring is needed
3 Tedlar bag samples taken approx 12 hours apart (0, 12, 24hrs)
Any single sample greater than 200
Average of 3 samples greater than 60
Average of 3 samples less than or equal to 60
Recommend evacuation
No evacuation; but continued monitoring is needed
Decision Tree for Evacuation Decisions Based on Benzene Levels
ICS Institute
EPA
20


ENVL
2 consecutive days of real-time air monitoring or sampling with Tedlar, HAPSITE, or Summa.
All samples are less than or equal to 6 ppb
Any reading greater than 6 ppb, restart two days of real-time sampling
8 hour-24 hour sample (time weighted average)
Less than or equal to 6 ppb residents can reoccupy (additional cleanup work in area may result in recommendation of evacuation)
Greater than 6 ppb, restart 2 days of real-time monitoring
Decision Tree for Reoccupancy of Evacuation Zone
ICS Institute
EPA
21

Special Projects – Liaison with Ops

ENVL

- Contingency planning for loss of containment to downstream
  - Special consideration of impacts on PCB contaminated sediments downstream
- Containment, recovery and assessment strategies
  - Submerged oil
- Modeling migration (Gabion Baskets)
- Sensitive, Historic and Tribal area identification
- Coordination with
  - Environment Canada
  - NOAA
  - USGS
  - Each brought in for various expertise

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Environmental Advisory Group

ENVL

- To provide scientific and technical support to IC
- Multi-agency
- Multi-disciplines
- Within Environmental Unit
- Reviewed Plans
- Inspected and evaluated overbank area
- Developed Cleanup Instruction Document for OPS
- Assisted in establishing consistent SCAT procedures

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SCAT/ENV coordination to set up process and Shoreland Treatment Recommendations (STRs)

ENVL

- Coordinated with Natural Resource Damage assessment (NRDA) trustees
- Standardized terminology used to document shoreline oiling conditions
- Utilized GPS enabled PDAs – Point Locations
- 5 –Step iterative process
- Addressed visible oil with standard methods

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Began evaluating Countermeasures

ENVL

- Multiple forms of oil to consider
  - Free flowing
  - Viscous and semi-solid
  - submerged
- Need for multiple recovery techniques
  - Gabion baskets
  - Boom
  - Aeration
  - In-situ burning
  - Recovery and removal of oil and vegetation
  - dispersants

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Establish Data Flow

ENVL

- Data Management Unit was established
- SCRIBE was utilized
- Mainly run by START
- Coordinated with EU and SIT

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ENVL

Intermediate Phase

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SCAT continues

ENVL

- Addressed oil-saturated soil
- Development of Phase 2 cleanup methods
- Habitat types identified
- Habitat-specific Phase 2 cleanup recommendations made
- Hot shot teams for spot clean ups during re-eval

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Clean up of Overbank areas, pooled and stranded oil

ENVL

- Portable vacuum
- Absorption techniques
- Manual removal
- Vegetation removal
- Water washes

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Counter measures

ENVL

- Studies continued

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Evaluation of Submerged Oil and Sensitive Ecosystems – with OPS

ENVL

- Qualitative assessment
- Quantitative assessment
- Ecological Habitat assessment
- Cleanup Recommendations

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Liaison between OPS and EAG

ENVL

- EAG meet biweekly
- Reviewed/revised plans
- Provided input on daily basis via ENVL and daily OPS Report out meeting

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Special Projects

ENVL

- Unknown vapors on islands
- Lab venting into warehouse

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Typical Daily Routine - Intermediate phase

ENVL

- Attend Ops Briefing
- Attend Command & General Staff – non active participant
- Coordinate with OPS & PRP counterparts on plans
- Attend OPS report out meeting
  - Mainly in regards to identifying and addressing sensitive environments
  - Liaison for Science Team
- Prepare items for IAP
- Evaluate and interpret Data as recieved
- Special Projects

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Long term Phase

ENVL

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Environmental Advisory Group → Scientific Support coordination Group

ENVL

- Established in 2011
- Government, academia and consulting fields
- Charged with providing technical expertise on several topics including
  - Detecting submerged oil
  - Submerged oil quantification (SOQ)
  - Oil chemistry
  - Hydrodynamic modelling
  - Effects of temperature
  - Biodegradation of submerged oil

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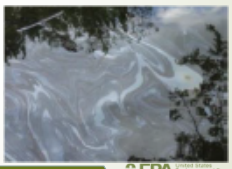
"Micro cleanups"

ENVL

- Final SCAT phase (check up and acceptance of remaining "hot spots")
- Disposal of remaining "oiled/oil contaminated debris"
- Response to reemerging sheens



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Questions

ENVL

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ENVL

Environmental Unit Leader
Unit 3

Communication within the Incident Management Team

Unit Objectives

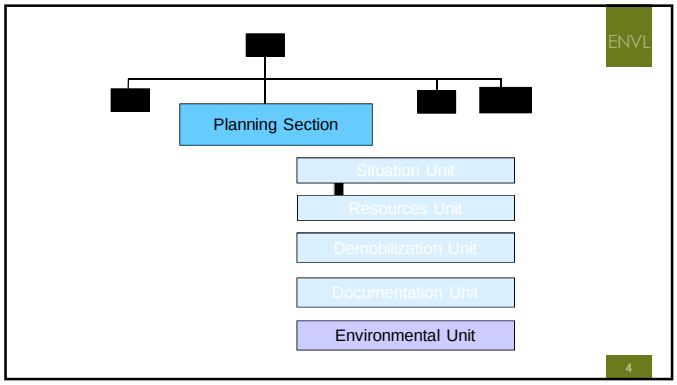
ENVL

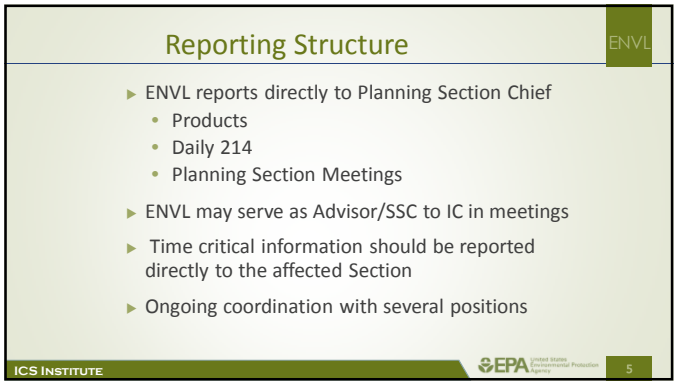
- Know where to get briefings and who to brief
- Understand the reporting structure within the ICS Structure
- Understand how ENVL will work with
  - Planning Section units
  - Other IMT Sections
  - Command Staff
  - Organizations outside of IMT

Briefings

ENVL

- Incoming – Receive from
  - Planning Section Chief (PSC)
  - Outgoing ENVL – Should overlap
  - Data Support Coor/SSC (if staffed)
- Give All incoming ENVL Staff
- Outgoing – Give to
  - Incoming ENVL – Should overlap
  - PSC


ENVL
Planning Section
Situation Unit
Resources Unit
Demobilization Unit
Documentation Unit
Environmental Unit
4


Reporting Structure
ENVL
ENVL reports directly to Planning Section Chief
Products
Daily 214
Planning Section Meetings
ENVL may serve as Advisor/SSC to IC in meetings
Time critical information should be reported directly to the affected Section
Ongoing coordination with several positions
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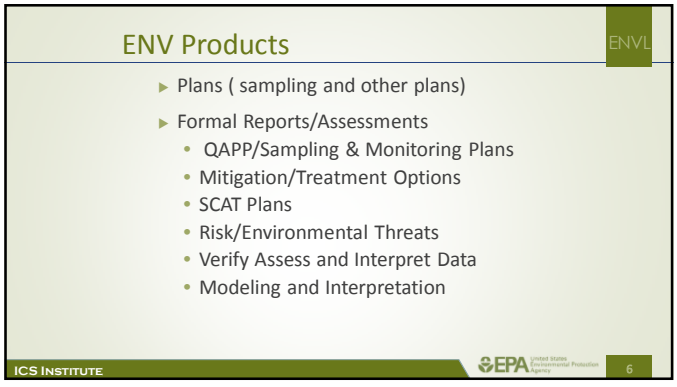
EPA
5


ENV Products
ENVL
Plans (sampling and other plans)
Formal Reports/Assessments
QAPP/Sampling & Monitoring Plans
Mitigation/Treatment Options
SCAT Plans
Risk/Environmental Threats
Verify Assess and Interpret Data
Modeling and Interpretation
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6

ICS 214

ENVL

7

Planning Section Meeting

ENVL

- PSC will normally call regular meetings of section
  - Includes all Planning Section Unit Leaders
- Avenue to communicate normal activities
- Meet informally with PSC on a regular basis to KEEP THEM IN THE LOOP

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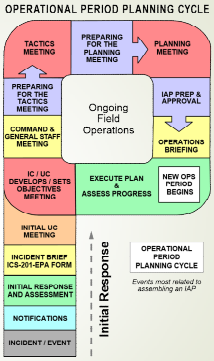
ENVL Role in Planning Cycle

ENVL



9

Handling Requests

ENVL

- All requests require an EPA ICS 213 General Message
  - Minor/routine response may be handled by a 213 (request form) or a 214 (Unit activity log)
- Major
  - May require PSC notification and/or approval
  - May require a formal work product

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ICS 213 - General Message

ENVL

- Document various activities
  - work requests
  - work performed/delivered
- May be used in place of a Resource Order (213RR), but not recommended
- ENV-specific 213 can be developed to cover requests to the ENV
- Other Unit-Specific 213 may be used by the ENVL to request work from other IMT sections

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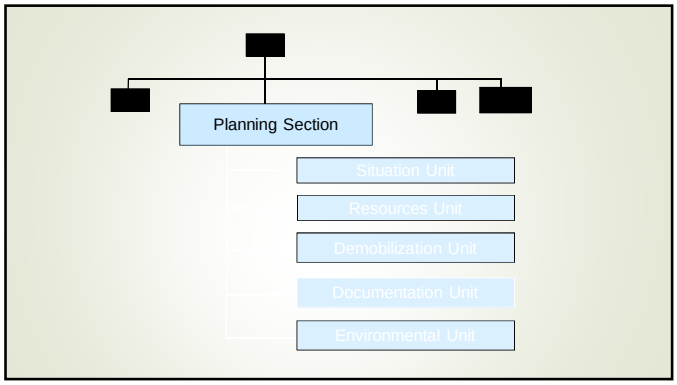
ICS 213



Situation Unit

ENVL

- Close communication between SIT and ENV
- Data & Data Flow
- GIS products
- Information from Field Observers (FOBs)
- Data for modeling / modeling results

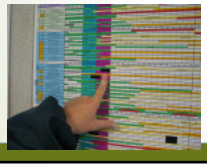
Data Positions in SIT

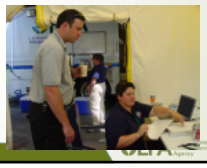
- Data Management Specialist
  - Manage and administer the incident Database(s)
  - Provide appropriate information for situational reporting
- Geographic Information Systems Specialist
  - Gather and compile updated information and provide map products

Resource Unit

ENVL

- Responsible for IMT Check In
- Provides status of IMT resources
- Check with them before requesting resources
- Responsible for the demob process





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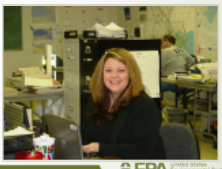
Documentation Unit

ENVL

- Sets the standard format and documentation numbering for the incident
- Maintains records for the incident



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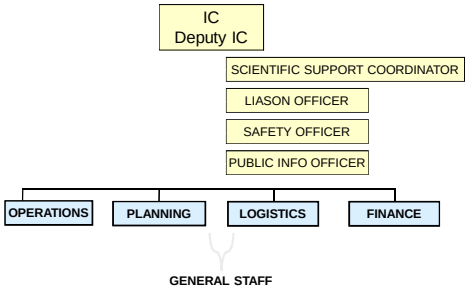
ENV and the General Staff

ENVL



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Operations

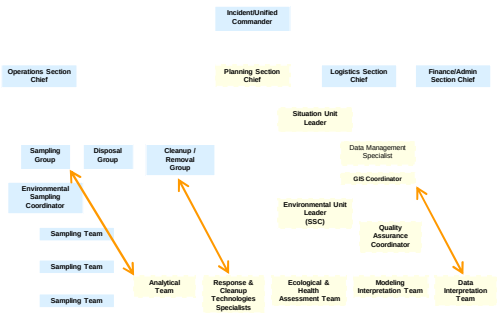
ENVL

- **Primary** role of ENV is to **support** Operations
- Data Gathering
- Know the needs of the Operations Section. Think ahead – anticipate needs
  - Environmental Assessment Branch
    - ✓Sampling Plans
    - ✓Sampling
    - ✓Tech Specs
  - SCAT Team

Operations Data Positon

ENVL

- Single Resource for Field Data Management
  - Capture, record and/or otherwise collect field data and information
  - Process, verify and report field data and information to the Situation Unit
  - Record or otherwise capture real monitoring measurements



Logistics

ENVL

- Resource ordering
- Facilities/Lodging
- Supplies
- Medical Unit
- Comms/IT
- Food

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Finance

ENVL

- Time Unit – Daily Hours/People Plus
- Expenditures – purchase card
- Ordering Contractors/Fund Allocation

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ENV and the Command Staff

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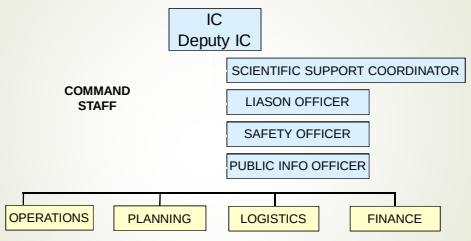

24

Command Data Position

ENVL

- IC may appoint a Deputy of a Tech Spec in Command to be the Data Support Coordinator
  - Work with to ensure ENV has proper personnel to implement Data Management Plan
  - Point of contact for all data management issues.

Scientific Support Coordinator

ENVL

- Appointed at Discretion of IC
- ENVL will
  - work hand and hand with SSC
  - provide data interpretation
  - provide technical support
- SSC will inform ENV of special topics of concern to the IC

Liaison Officer

ENVL

- Contact for agency representatives assigned to the incident
  - Assisting/Cooperating Agencies
- Delivers requests from agency representatives to ENV
- Delivers information back to stakeholders from incident
- May be involved in setting up Science Advisory Groups

Safety Officer

ENVL

- Establishes action levels
- Monitors field activities
- Ensures compliance with health & safety regulations and guidelines
- Creates safety messages IAP

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Public Information Officer

ENVL

- May come to you for information or interpretation
- ENVL provides support to PIO in developing community messages –plain language
- Is your link to what is going on in the "real world"
- Can help identify public issues.

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Messaging with PIO

ENVL

- Assist PIO in developing messaging that is:
  - Understandable
  - Timely
  - Accurate
  - Consistent
- Review, Approve and Release Process

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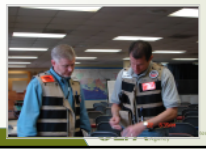
IC

ENVL

- May utilize ENVL as a SSC
- May utilize ENVL as Technical Advisor
- May request attendance at meetings
  - These activities okay as long as PSC is in the loop



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Your Replacement

ENVL

- Ensure they are adequately briefed
  - Unit Responsibilities
  - Products/deadlines/timelines
  - Unit Organization/Personnel
  - Meeting Schedule

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Other Special Groups

ENVL

- TWG
- EEC
- Stakeholder TAG

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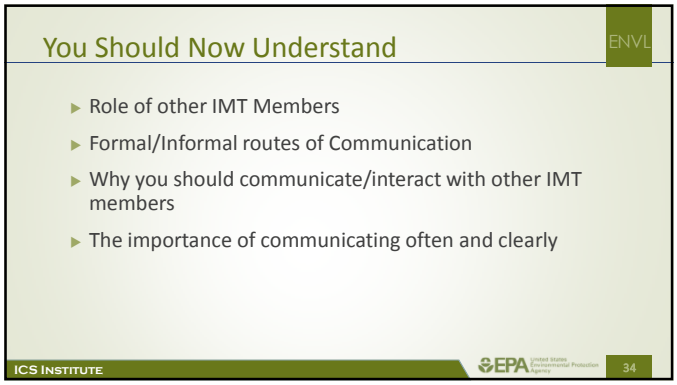
You Should Now Understand
ENVL
Role of other IMT Members
Formal/Informal routes of Communication
Why you should communicate/interact with other IMT members
The importance of communicating often and clearly
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ENVL

Unit 4

QUALITY IN RESPONSE

– QA where the rubber hits the road

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Documenting

- What you plan to do
- What you did
- That you did what you planned to do
- AND if you didn't how you are fixing it

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Good General Theory But Why?

- Legal/Policy
- Defense

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Policy/Legal

ENVL

- Information Data Quality Act
  - It's not just a good idea…it is the law

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Policy/Legal

ENVL

EPA Quality Assurance Policy

CIO 2105.0 –Policy and Program requirements for the Mandatory Agency-Wide Quality System

Procedures CIO 2105.P.02

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Policy/Legal

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Quality Management Plan

- *Every Region has one*
  - *Box of chocolates*
  - *Consistency*

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Real Reason You Should Follow QA Process

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Protect Thyself

If you don't document…. Did it really happen?

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What You Are Doing As EUL

ENVL

Decisions at Deadlines

You are the one armed scientist…

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Looking Forward

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- What decisions are next?
- Start planning for the next decision NOW!
- Health and Safety vs. Risk

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Exit Strategy: Assuming you ever want to go home….

ENVL

- What is the goal (is it achievable?)
- Sample Plan is to document that Goal.

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Establish Data Quality Objectives

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- **What is the Goal/Decision**
  - **(usually a challenge)**
- **Sampling to lead to a decision or answer questions**
  - **not Academia (we are not research, we make decisions)**
    - ✓ **Ask better questions**

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Systematic Planning

ENVL

Data Quality Objectives (DQO) Process

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Steps in Systematic Planning

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- Organization
- Project goal
- Schedule
- Data Needs
- Criteria
- Data collection
- Quality assurance
- Analysis

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DQO Process

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1. State the problem
2. Identify the goal of the study
3. Identify the information inputs
4. Define the boundaries of the study
5. Develop the analytical approach
6. Specify performance or acceptable criteria
7. Develop the plan for obtaining data

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DQO Process

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State the Problem

- Concise description of the problem
- Identify leader (you!) and members of the planning team
- Develop conceptual model of the problem
- Determine resources-budget personnel and schedule

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DQO Process

ENVL

Identify the goal of the study

(In the case of Response)

- Develop decision statement
- Organize multiple decisions

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DQO Process

ENVL

Identify Information Inputs

- Identify type and sources of information needed to resolve decisions
- Identify basis of information that will guide or support choices in later DQO process
- Select sampling and analyze methods for generating information

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DQO Process

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End user of Data

(Analyses…risk assessor, air modeler, etc..)

Unless you know what they need, how do you make the determination on what to collect

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DQO Process

ENVL

Define Boundaries of the Study

- Define populations of interest and their relevant special boundaries
- Define what constitutes a sampling unit
- Specify temporal boundaries and physical constraints associated with sample collection
- Specify smallest unit on which decisions can be made

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DQO Process

ENVL

Develop the Analytical Approach

- Specify appropriate population parameters for making decisions
- Choose an Action Level and generate an If…. Then…Else/Or decision rule

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DQO Process

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End User

How will "they" determine if you are meeting the goal/decision?

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DQO Process

ENVL

Specify Performance or Acceptance Criteria

- Specify the decision role as a statistical hypothesis (as if…)
- Examine consequences of making incorrect decisions from the test
- Place limits on the likelihood of making decision errors

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DQO Process

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Develop Detailed Plan for Obtaining Data

- Compile information from information inputs
- Use this information to identify sampling and analysis designs appropriate for your use
- Select and document a design that will yield data that will achieve your performance criteria

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DQO Process

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Sample Plan

- How are you meeting the Data Quality Objective?
- End user- unless you know what they need how do you determine what to collect
- If you don't know why you are sampling you have no logic to stop sampling

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DQO Process

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Sample Plan

Establishes consistency

- Standard Operating Procedures
  - Different people do it different ways. Each may be correct but may not be able to compare the data…. Standardize!!!!!!!!
- Document The Decision(s)

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QUESTIONS

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ENVL

Environmental Unit Leader
Unit 5

SAMPLING PLAN DEVELOPMENT

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Objectives

- Understand the purpose of a sampling plan
- Understand the development of a sampling plan
- Identify useful guidance and templates for sampling plan development

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Sampling Plan Purpose

- To ensure that data are representative of target population
- To ensure that data are defensible for their intended use
- To ensure efficient use of time, money, and resources

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Sampling Plan Development

ENVL

- Sampling Plan Formats Vary
  - From Region to Region or HQ to Region
  - Separate Documents (SAP, FSP and QAP) but covers all elements of a QAPP
  - Documents are Combined into one document called a QAPP
  - Sampling Briefs
- Not a one size fits all approach

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Sampling Plan Elements

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- Sampling Design
- Sampling Methods
- Sample Handling and Custody
- Analytical Methods
- Quality Control
- Instrument/Equipment
  Testing, Inspection, Maintenance, Calibration
- Supplies & Consumables

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Sampling Plan Scoping Team

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- ENV. Leader or ENV. Unit representative
- OPS representative
- SIT Unit representative – maps/charts
- Data Management Coordinator
- Lab coordinator
- Technical specialists

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Sampling Plan Design Process

- Use the Data Quality Objectives Process
- Factors in Selecting a Sampling Design
  - Information about the Area of Concern
  - Data Quality Information
  - Any Constraints

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Factors to Consider

Choice of Sampling Design

Information About The Process or Area of Concern	Data Quality Information	Constraints
Conceptual Model of the Potential Environmental Hazard	Purpose of Data Collection	Sampling/Analysis Constraints
▸ Size/Breadth of Area of Concern	Spatial and Temporal Boundaries of Study	Time/Schedule Constraints
▸ Media of concern	Preliminary Estimates of Variance	Geographical Constraints
▸ Distributions of Contaminant	Statistical Parameter of Interest	Budget Constraints
▸ Sources of Variability	Tolerance for Potential Decision Errors	Compositing Constraints
▸ Chemical/Physical Properties of Contaminant	Overall Precision Requirements (width of the gray region)	
Additional Information About the Process or Area	Sample Support	

Sampling Plan Design Data Quality Objectives

- In the scoping meeting, determine the DQOs:
  - What is the purpose of the sample collection?
  - Who will use the data?
  - What decisions will be based on the data?
  - What detection limits are needed?
  - Are samples evidentiary?

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Sampling Plan Design
Data Quality Objectives

ENVL

- Talk about the overall Sample strategy
- Decide what is the most appropriate design
  - Random (unbiased) sampling design?
  - Judgmental (biased) sampling design?
  - Discrete or composite?
  - Sampling grid or no grid?

Guidance for Choosing a Sampling Design for Environmental Data Collection, QA/G-5s

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Sampling Plan
Data Quality Objectives

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- What turnaround time is required?
- Are there critical sample locations?
- Are there evidence markers?
- Are there photos?

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Sampling Plan Content

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- Number of samples
- Location of samples
- Timing of samples
- Justification for the number, location and timing
- Type of samples
- Media
- Sampling methodology
- Analytical Methods

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Sampling Plan

ENVL

Assign ENV personnel to work with OPS personnel to begin generating a full SAP, in accordance with EPA's QAPP guidance.

http://www.epa.gov/quality

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EPA United States Environmental Protection Agency

Guidance For Sampling & QA Plans

ENVL

- Guidance for Quality Assurance Project Plans, EPA QA/G-5
- Guidance on Choosing a Sampling Design for Environmental Data Collection, EPA QA/G-5s
- Guidance on Systematic Planning using the Data Quality Objectives Process, EPA QA/G-4

http://www.epa.gov/quality

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EPA United States Environmental Protection Agency

Sampling Plans in the ICS

ENVL

- Full sampling plan
- Sampling Brief
- Generic to site specific SAP/QAPP
- ICS 204


INTERIM FINAL
EMERGENCY RESPONSE
QUALITY ASSURANCE SAMPLING PLAN
FOR
HURRICANE KATRINA RESPONSE
Screening Level Sampling for Sediment
in Areas Where Flood Water Receded
SOUTHEAST, LOUISIANA

ICS Institute

EPA United States Environmental Protection Agency

Generic Sampling Plans

ENVL

- Initial Generic QAPP already approved
- Site-Specific QAPP Addendum serves as SAP/QAPP

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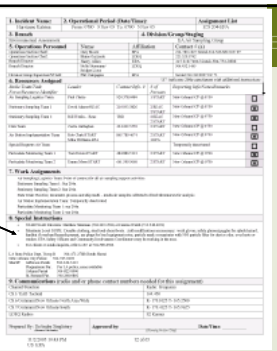
ICS 204

ENVL

Note the reference to special instructions on ICS 204



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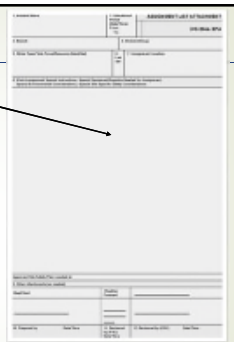
EPA

ICS 204a-EPA

ENVL

- More specific instructions with regard to sampling protocols
- Identifies key points for samplers
- Sampling plan is made available to sampling teams for more comprehensive communication



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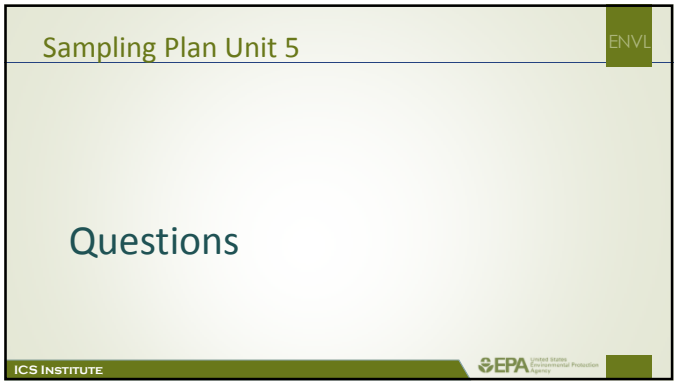
Sampling Plan Unit 5
ENVL
Questions
ICS INSTITUTE
EPA

ENVL

Environmental Unit Leader
Unit 6
Analysis

ICS Institute EPA 1

Goals

ENVL

To leave with a general understanding of the analysis support available to Incident Command during response activities including:

- Field Support
- Fixed Lab Support
- Specialty Support

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Analysis – Field Support

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- Screening
  - Immediate life threatening or severe health and safety conditions
    - ✓ Hand-held detectors
      - Chemical
      - Radiochemical
      - Biological – not much available at this time ????
  - Specialized screening when chemical warfare agents (CWA) involved
    - ✓ Screen to determine if fixed laboratory will accept sample
      - All Hazard Receipt Facility Protocols (AHRF)
        - https://cfpub.epa.gov/si/si_public_record_report.cfm?dirEntryId=199346
        - CWA
        - Radiochemical
      - AHRF available at Region 1 and Region 10 lab
      - Other Regions working with Civil Support Teams (CST) to provide screening

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Analysis – Field Support

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- Screening
  - Site characterization – decision making (e.g. what/where do I do/go next) **
    - ✓ Hand-held detectors
      - Radiochemical
    - ✓ Hand-held/Portable Detectors
      - X-Ray Fluorescence (XRF)
      - GC-various detectors
      - Ramon
      - Ion Mobility Spectrometers (e.g. ADP 2000)
      - MultiRAE and AreaRAE Detectors
  - ** Must be consistent with Data Quality Objectives (DQO) and Quality Assurance Project Plan (QAPP)
    - ✓ Screening efforts may (should) require confirmatory analyses through fixed laboratory analysis

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Analysis – Field Support

ENVL

- Monitoring
  - Continuous evaluation of conditions at a site
  - Personal Protection
    - ✓ Indicator badges
    - ✓ Absorption tubes with air pumps
  - Site Evaluation during a site incident
    - ✓ Particulate Matter (PM)
    - ✓ Filters (e.g. asbestos) – low and high volume air pumps
    - ✓ Mini-Chemical-Agent-Monitor (MiniCams)
      - Near-real time monitor
      - Gas Chromatograph with attached air sampling device
  - Data Management
    - ✓ VIPER -wireless network based communications system designed to enable real time transmission of data from field sensors to a local computer, remote computer, or enterprise server and provide data management, analysis, and visualization
    - ✓ https://response.epa.gov/site/site_profile.aspx?site_id=5033

Analysis – Field Support

ENVL

- Quality Assurance Field Activities Procedures (QAFAP)
  - EPA Classification No.: CIO 2105-P-02.0
  - Intended to be applied by all organizations within the Agency that collect environmental data, regardless of its intended use
  - Includes guidance for personnel and training, document control, records management, sampling and environmental data management, field docuementation, field equipment, field inspections and investigation, reports, internal audits, and corrective action

Analysis – Fixed Laboratory Support

ENVL

- START – Superfund Technical Assessment and Response Team
  - Full support to the OSC - sampling lab analysis data management
- START most commonly used but many other options available
- Regional Labs
  - Dedicated to Regional applications, but support all Regions as needed
  - Specialized capabilities (e.g. Regions 1,3,6,9 10 have CWA capability)
  - Some Regions support mobile laboratory assets
- Environmental Response Team (ERT)
  - Scientific, Engineering, Response and Analytical Services (SERAS)
  - Monitoring and Analytical support to all Regions (fixed lab and mobile lab)

Analysis – Fixed Laboratory Support

ENVL

- Contract Laboratory Program (CLP)
  - Office of Superfund Remediation and Technology Innovation (OSRTI)/Analytical Services Branch (ASB)
  - Organic and metals laboratory support
  - Predominantly support for remedial program, but also supports removal program
- Regional support contracts
  - Varies within the Regions

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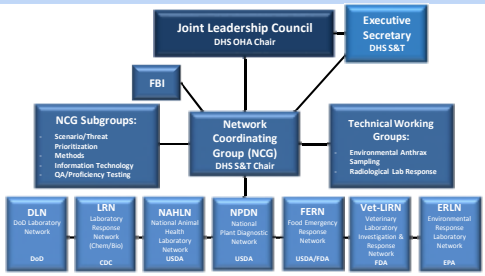
Analysis – Fixed Laboratory Support

ENVL

- Environmental Response Laboratory Network (ERLN)
  - Administered through Office of Emergency Management (OEM)
  - Began as a response to World Trade Center disaster
  - Integral member to Federal, DHS-chaired Integrated Consortium of Laboratory Network (ICLN)
  - ** Not Just For Homeland Security Issues or Emergencies – but for any Regional analytical need
  - → **ICLN**

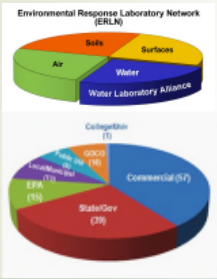
ICLN Organizational Structure



More than 450 distinct labs represented in member response networks.

Analysis – Fixed Laboratory Support ERLN

ENVL



- An all hazards/all environmental media laboratory network for chemical (including CWA), biological and radiological Agents supporting the needs of the response community
- Allow for day-to-day use supporting incidents of any scale during preparedness, response, remediation.
- Coordinated Partnership with National Homeland Security Research Center (NHSRC) and Office of Resource Conservation and Recovery (ORCR) for methods and method development
- Partnership with Office of Water's Water Laboratory Alliance (WLA) and ORIA Radiological Laboratory program

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Analysis – Fixed Laboratory Support Accessing the ERLN

ENVL

- https://www.epa.gov/emergency-response/who-should-join-environmental-response-laboratory-network
- Register in the EPA Laboratory Compendium

Analysis – Fixed Laboratory Support
What I Can Do With The ERLN

ENVL

- Search Laboratory Locations and Capabilities
  - Access to Chemical, Biological and Radiological Capabilities
- Procure Laboratory Services
  - Region → Develop Needs and Data Quality Objectives
  - Region → Contact OEM
  - OEM → Contacts ERLN Labs for Quotes
  - OEM → Presents Lab Options to Region
  - Region → Approves Laboratory
  - OEM → Submits Quotes to Contract Officer (CO)
  - CO → Submits "Contract" to Lab
  - Region → Provides Funding Through Purchase Requisition (PR)

Analysis – Specialty Analytical Support

ENVL

- **TAGA**: **Trace Atmospheric Gas Analyzer**
- Self-contained mobile laboratory to monitor air quality
- Real-time sampling and analysis
- Detects chemicals at very low levels.
- Specialized sampling equipment to use at remote locations

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Analysis – Specialty Analytical Support

ENVL

- **ASPECT: Airborne Spectral Photometric Environmental Collection Technology**
- Detects and gathers chemical and radiological data to assist response agencies in the US
- Uses a variety of sensors and cameras that can quickly collect data and information and provide it to emergency response teams
  - Gamma Spectrometer, Infrared Line Camera, Fourier Transform Infrared Spectrometer

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Analysis – Specialty Analytical Support

ENVL

- **National Analytical Radiation Environmental Laboratory (NAREL)**
- Comprehensive environmental laboratory managed by EPA's Office of Radiation and Indoor Air (ORIA)
- Incorporates state-of-the-art laboratory technology and equipment and include the latest health and safety techniques
- **National Center for Radiation Field Operations (NCRFO)**
- Essential component of EPA's Radiological Emergency Response Team (RERT) and is key to EPA's response to radiological emergencies and accidents nationwide

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Analysis – Specialty Analytical Support
Portable High-Throughput-Integrated Laboratory Identification System (PHILIS)

ENVL

- Mobile laboratories operated by OEM/CBRN Consequence Management Advisory Division (CMAD)
- Standardized under the EPA's Environmental Response Laboratory Network (ERLN)
- Accredited through National Environmental Laboratory Program (NELAP)
- ** All analyses are confirmatory
- VOCs, SVOCs, PCBs, Pesticides, Air (absorbent Tubes) (canisters)
- ** Chemical Warfare Agents (CWA) and Toxic Industrial Chemicals (TIC)
- On-board LIMS for multiple data deliverables including SCRIBE compatible deliverables

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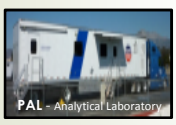
Analysis – Specialty Analytical Support
Portable High-Throughput-Integrated Laboratory Identification System (PHILIS)

ENVL

- Six separate mobile analytical vehicles for sample preparation and analyses
- 19 separate GC/MS analyzers
- 2 GC/Electron Capture analyzers for PCBs/Pesticides
- Basically fixed laboratory on wheels
- Stationed in Edison, NJ and Castle Rock, CO and can be deployed within 24 to 48 hours to support emergency response and clean-up actions
- Offers Regions cost savings advantages


PAL - Analytical Laboratory


PHILIS LU – PHILIS Laboratory Unit


APL01 & APL02 – Analytical Laboratories

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Analysis – Specialty Analytical Support Enhanced BSL-2 Biological Laboratory

ENVL

- Laboratory operated by OEM/CBRN Consequence Management Advisory Division (CMAD)
- Originally developed for analysis of environmental samples potentially contaminated with Anthrax
- Currently developing capability for analysis of environmental samples potentially contaminated with ricin
- Gearing up for method validation for analysis of Anthrax using Rapid Viability Polymerase Chain Reaction protocol (RV-PCR)
  - Determines viable Anthrax spores in a day instead of a week
- Other methods being developed for non-routine analytes (e.g. select agents)

Certified Biosafety Cabinet and Chemical Fume Hood that houses a Janus Automated Workstation for high throughput sample processing.

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Analysis – What You Need To Do

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- Ensure there is a QAPP with specific DQOs
  - Know and understand the analytes of concern
    - ✓ Don't just ask for the analytes that are listed in a certain method – if you just need lead, don't ask for 23 metals
  - Know and understand which analytical method you need
    - ✓ There are many – so make sure the method is applicable to your specific needs
  - Know your required detection limit needs.
    - ✓ Don't just tell the lab to give you the lowest detection limits they can – be specific
    - ✓ Understand what the detection limit really means
- Use a lab that is accredited through a Nationally recognized accreditation program (NELAP, ISO, EPA Drinking Water, etc.)
- Ensure the lab can deliver data in acceptable electronic deliverable format
  - As per policy – SCRIBE compatible deliverables for emergency response activities

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Analysis – What You Need To Do - Continued

ENVL

- Ensure lab can meet your turnaround needs, especially if you need analysis over the weekends
- Ensure lab can meet your capacity needs
- Audit lab if you have time (you can work with OEM/CMAD to audit labs under the ERLN umbrella)
- Determine if lab can provide sample containers

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Analysis – Points of Contact

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- Field operations and QAFAP:
  - ERT: Harry Compton, Chief Compton.Harry@epa.gov
- Scribe and VIPER:
  - ERT: Joe Schaefer, Schaefer.Joe@epa.gov
- Contract Lab Program (CLP)
  - ASB: Keith Upah, acting Chief Upah.Keith@epa.gov
- ERLN/ICLN
  - CMAD: Terry Smith, Smith.Terry@epa.gov
- TAGA:
  - ERT: Dave Mickunas, Mickunas.Dave@epa.gov
- ASPECT:
  - CMAD: Paul Kudarauskas, chief, Kudarauskas.Paul@epa.gov

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Analysis – Points of Contact

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- NAREL:
  - ORIA/NAREL: John Griggs, Director, Griggs.John@epa.gov
- NCRFO:
  - ORIA/NCRFO: Edward Wilds, acting Director, Wilds.Edward@epa.gov
- PHILIS
  - CMAD: Terry Smith, Smith.Terry@epa.gov
  - CMAD: Larry Kaelin, Kaelin.Lawrence@epa.gov

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Environmental Unit Leader
Unit 7
Headquarters
Environmental Unit

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Goals

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To leave here with an understanding of the organization and role for a Headquarters (HQ) Environmental Unit (EU)- specifically with respect to:

- Lines of communication with
  - Regional EUs
  - HQ Public Information Office (PIO)
  - HQ Data Management Coordinator (new position to HQ)
  - HQ Senior Management
- Specific Duties

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Roles of the HQ EU During Various Emergency Responses

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- Local or multi-regional but small ER
  - No HQ EU role
  - Limited "virtual" HQ EU for regional support and situational awareness (1-2 staff)
  - Limited formal HQ EU (i.e. EOC Desk) to provide technical assistance (1-2 staff)
- Larger multi-regional ER and Nationally Significant Incident (NSI)
  - Virtual HQ EU
  - Formal HQ EU (EOC Desk)
    - ✓ Technical support to Region EU
    - ✓ Coordination with Regional EUs
      - Review of QAPPS, Sampling Plans
      - Daily communication with Regional EUs
      - Data review
      - Data communication
    - ✓ Coordination within HQ EOC
- NSI – HQ EOC and HQ EU may take on lead roles

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Organization of the HQ EU

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- EU Desk in HQ Emergency Operations Center
- Sits under Planning Section in ICS
- May be staffed by single entity (EU Leader) or EU Leader + multiple staff members
- Designed to incorporate Subject Matter Expert(s) relevant to the response needs
- Can expand to include Science Support Coordinator or Science Team/Technical Work Group

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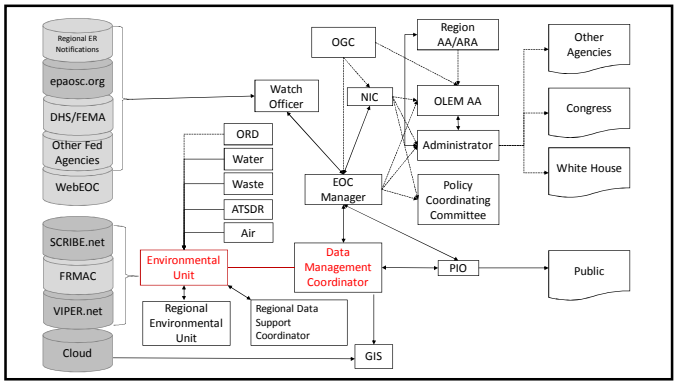
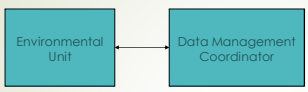


Organization of the HQ EU

ENVL



- Data Management Coordinator is a new position in HQ EOC
- Position not currently defined in the Incident Management Handbook
- Position defined in Data Management Playbook
- DMC lies within the HQ EU and will be the HQ EU Leader during an incident
- DMC will pull in SME as necessary

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Duties of HQ EU
Limited Role

ENVL

- Maintain situational awareness
- Provide technical reach-back support to regional EUs
- Review incident related documents
  - Sampling Plans
  - QAPP
  - Site Risk Assessments
  - Media correspondence
  - Etc.
- Communicate
  - Regional EU
  - Regional Data support Coordinator
  - HQ EOC Manager

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Why The Need to Maintain Situational Awareness at HQ

ENVL

- Enables HQ to provide:
  - Quick responses to inquiries from:
    - ✓President and Cabinet
    - ✓Administrator and Deputy Administrator
    - ✓HQ Program Offices
    - ✓National media outlets

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Duties of HQ EU
When More Active Role is Necessary

ENVL

- Review Region's Site Specific Data Management Plan (DMP)
  - Align the incident specific OEM ER Data and Information Plan with the Region's Site Specific DMP
  - Questions and inquiries about the DMP should be directed to the Incident Command – Data Support Coordinator
  - If Agency direction and management objectives require changes to the Region's Site Specific DMP, communicate those issues to the RIC

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Duties of HQ EU When More Active Role is Necessary

ENVL

- Review the incident QAPP, Data Quality Objectives (DQO), and sample plans.
  - Questions and inquiries about the QAPP or sample planning should be directed to the Incident Command – Data Support Coordinator.
  - If Agency direction and management objectives require changes to the QAPP and sample planning, communicate those issues to the RIC so that Data Quality Objectives (DQO) can be aligned.

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Duties of HQ EU When More Active Role is Necessary

ENVL

- OEM Emergency Response Data and Information Plan
  - Develop incident specific OEM Emergency Response Data and Information Plan. The plan should address:
    - ✓ The uses and needs of data and information by the various offices at Headquarters
    - ✓ Be aligned with the Region's Site Specific DMP
    - ✓ Identify process data review and issue resolution
    - ✓ Data package consistency and specific data and information needs from Scribe
    - ✓ Identifying data and information product deliverables to support various work at Headquarters to properly support OEM and the other Headquarters Offices
    - ✓ Role and responsibilities of staff working data and information at Headquarters including identifying personnel resource needs to sustain operations

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Duties of HQ EU When More Active Role is Necessary

ENVL

- Receiving Data and Information from the Region(s)
  - ✓ Facilitate the reception of data and information from the Region(s) in support of HQ EOC operations
  - ✓ The access to data and information involves all the disciplines across each functional positions of the Incident/Unified Command's command and general staff
    - Health and Safety
    - Public Affairs
    - Liaison – Stakeholder information
    - Field observations and recon data and information
    - Resources
    - Situational Information and Common Operating Picture
    - GIS, viewer, images, documents, and database information
    - Environmental sampling, monitoring, assessment, interpretation, planning.
    - Logistics and Finance

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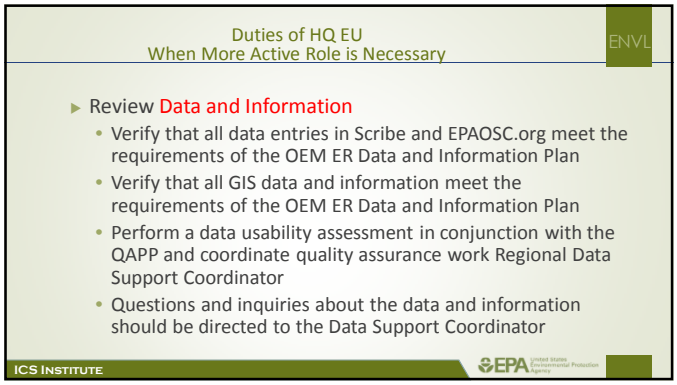
Duties of HQ EU
When More Active Role is Necessary
ENVL
Review Data and Information
Verify that all data entries in Scribe and EPAOSC.org meet the requirements of the OEM ER Data and Information Plan
Verify that all GIS data and information meet the requirements of the OEM ER Data and Information Plan
Perform a data usability assessment in conjunction with the QAPP and coordinate quality assurance work Regional Data Support Coordinator
Questions and inquiries about the data and information should be directed to the Data Support Coordinator
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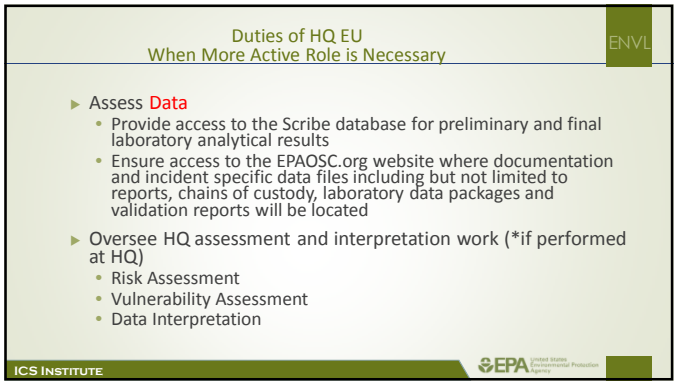
Duties of HQ EU
When More Active Role is Necessary
ENVL
Assess Data
Provide access to the Scribe database for preliminary and final laboratory analytical results
Ensure access to the EPAOSC.org website where documentation and incident specific data files including but not limited to reports, chains of custody, laboratory data packages and validation reports will be located
Oversee HQ assessment and interpretation work (*if performed at HQ)
Risk Assessment
Vulnerability Assessment
Data Interpretation
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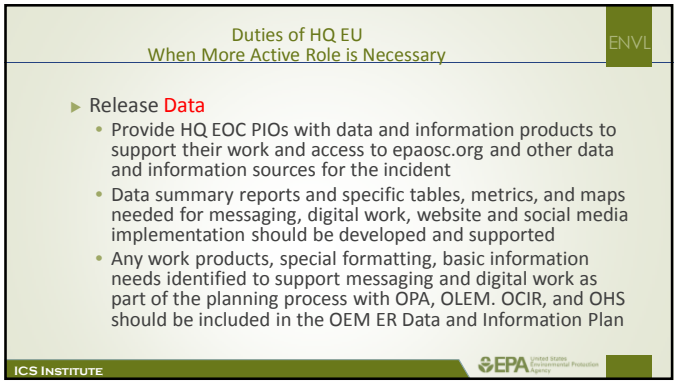
Duties of HQ EU
When More Active Role is Necessary
ENVL
Release Data
Provide HQ EOC PIOs with data and information products to support their work and access to epaosc.org and other data and information sources for the incident
Data summary reports and specific tables, metrics, and maps needed for messaging, digital work, website and social media implementation should be developed and supported
Any work products, special formatting, basic information needs identified to support messaging and digital work as part of the planning process with OPA, OLEM. OCIR, and OHS should be included in the OEM ER Data and Information Plan
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HQ EU Final Thoughts

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- Roles and Responsibilities are flexible depending upon scale of the event
  - No Role → Virtual Role → Significant Role → Lead Role **
- HQ EU may have a lead role during a National Significant Incident

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Environmental Unit Leader
Unit 8

Case Study: A Day in the Life of an Environmental Unit Leader

Groundhog Day

ENVL

Time	Meeting Name
0730	Reoc Meeting
0830	Water OPS Call
0915	Sit Rep Info Due
1200	Receive preliminary lab data
1230	EU Call
1330	NMED Call
1400	Press Call Receive validated lab data
1630	Draft data summaries due
1700	OPS Call
1730	RA Bullets Due

Begin and end each day with an intra EU meeting

Environmental Unit Coordination

ENVL

- Daily EU Call at set time and phone #
- All the Environmental Units (HQ, Region, field) must have representation on the EU Call
- EU Calls are valuable
  - Avoids duplicative efforts
  - Warns of upcoming issues
  - Promotes consistency across the response

Burnout

ENVL

- You will feel burned-out after 7 – 10 days
- Closed rotation of three Environmental Unit Leaders works well
- Dealing with stress:
  - Critical Incident Stress Management (CISM) (https://semspub.epa.gov/work/HQ/174228.pdf)
  - Employee Assistance Program (www.eapconsultants.com)

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Environmental Unit Organization Chart

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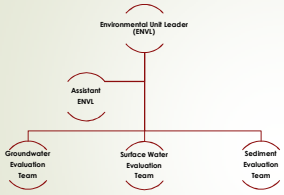
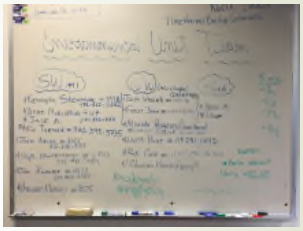


Remember "span of control"



Don't try to do it all

ENVL

- A large response has more information, meetings, and tasks than one person can handle. Grow the EU to handle the workload.
- Remember "span of control"
  - Supervise three to seven people
- Assign a person to lead each EU task
  - e.g., Surface Water, Sediment and Groundwater Tasks
- Develop & memorialize a standard operation procedure for each task
- Scheduling of people within the EU to assure adequate coverage at critical times during the day (e.g., who works and when they work)

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Forms, forms and more forms

ENVL

- ICS Form 201 – Initial Incident Action Plan (IAP)
- ICS Form 202 – Incident Objectives
- ICS Form 203 – Organization List
- ICS Form 204 – Assignment List
- ICS Form 205a – Communication Plan (phone #s)
- ICS Form 207 - Organization Chart
- ICS Form 213RR – Request for personnel and/or equipment
- ICS Form 214 – Activity Log
- ICS Form 215 – Operational Planning Worksheet
- ICS Form 230 – Daily Schedule

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ICS Form 201
Initial Incident Action Plan (IAP)

ENVL

- Ends the initial response phase and launches the Incident Command System (ICS) process
- Used to brief initial personnel assigned to the response
- Begins the managing, monitoring and planning the response
- After the initial 201 form, an IAP will be developed for each operational period

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ICS Form 213RR – Request for "stuff"

ENVL

- Used to request equipment or personnel
- May be prepared by the Environmental Unit
- Must be approved by the Planning Section Chief (PSC)
  - Or other member of the Command or General Staff
- Logistics Section Chief (LSC) will work to see if the resource can be provided from within the EPA
- If the resource can't be obtained within the EPA, the LSC will forward the form to the Finance Section Chief (FSC) to initiate procurement process

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ICS Form 214 – Activity Log

ENVL

- Is prepared during each operational period
- Lists personnel assigned to the Environmental Unit
- Lists the activities of the Environmental Unit within the operational period

Incident Action Plan (IAP)

ENVL

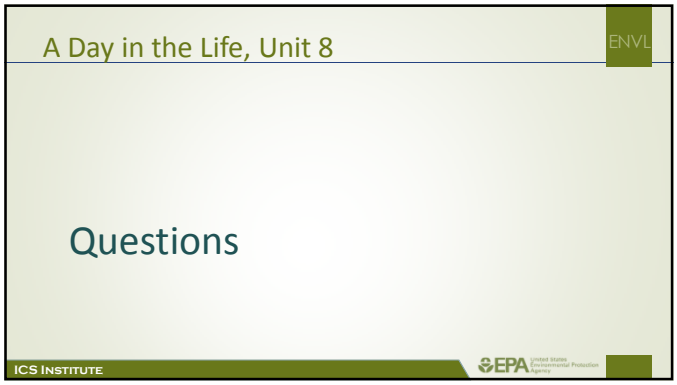
- Is a compilation of ICS forms
- IAP may contain the following ICS forms:
  - ICS 202 – Incident Objectives
  - ICS 204 – Assignment List
  - ICS 205 – Communication Plan
    - ✓ Comms List (phone #s)
  - ICS 207 – Organization Chart
  - ICS 230 – Daily Schedule

Visit the Response

ENVL







A Day in the Life, Unit 8
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Questions
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Environmental Unit Leader
Unit 9

Approach to Emergency Response Data Management

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Why are you here?

- Understand what's required for a response to have successful data management
- How can you adjust your work to help everyone succeed when it comes to data
- The response will end, but the data always lives on

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EPA's Emergency Response Program is about solving problems



Managing Emergency Response Data

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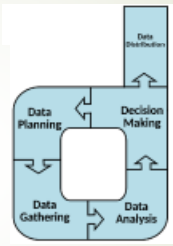
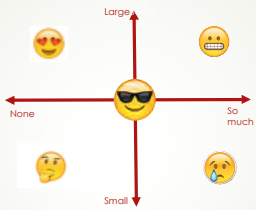
- Objective is to facilitate that problem solving process using information
- Our tools and processes are designed to move that information



ICS Institute EPA

Emergency Response Matrix

ENVL



ICS Institute EPA

How do you know if data management on your response is going well?

ENVL

ICS Institute EPA

Main Data Management Issues

ENVL

- Consistency
  - Analyte names (TCE vs. Trichloroethene vs….
  - Units (ppm vs. mg/kg, ug/m3 vs µg/m3)
  - Reporting numbers (# of staff shown on sitrep vs. IAP)
- Deviations from the plan
  - Operations occurring without knowledge of SIT or EU
  - Analysis of data in conflict with reason it was collected
- Starting from scratch
- Only contractors deal with data

ICS Institute EPA

Key Questions

ENVL

- What data exists?
- Why are you collecting it?
- Who is responsible for it?
- Where is it and where is it going?
- How does it look?

ICS Institute EPA

Data Team's Approach to ERs

ENVL

- Prepare
  - Data deliverables required under support contracts
  - Train, train, train
- Assess
  - What problems is the ER trying to solve?
  - What questions are the IC/UC trying to answer?
  - What information do they need in order to solve it
- Plan
  - Document what you need to do
  - Document the steps you need to take
- Execute
  - Get the proper resources, organization and workflow together to put your plan into action
- Re-Assess
  - Its an Emergency! Prepare to rapidly adjust everything you had planned to do.

ICS Institute EPA

Data Management Plans

ENVL

ICS Institute

EPA

Plans, Plans, Plans

ENVL

- Workplans
- Sampling and Analysis Plans
- Incident Action Plan
- Health & Safety Plan
- Quality Assurance Plans

Which of these plans tells us how to collect, process, store and analyze our data?

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EPA

Data Management Plan!!!

ENVL

- Approach to data management
  - Types of data you are dealing with
  - Tools being used to collect, manage and display it
- Requirements
  - Specifics on what things need to be documented and how they should be described
- How you are going to use your data
  - Standardized reports
  - GIS viewers
  - Models

ICS Institute

EPA

Regional Data Management Plan

ENVL

- 1. What are your typical data streams and deliverables?
- 2. What are the best practices to manage those data streams and generate those deliverables?
- 3. How will the data and deliverables be QA'd?
- 4. What resources are required?
- 5. What is the data flow?

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Site Specific Data Management Plan

ENVL

- Shorter (hopefully) Document
- References the Regional Plan
- Identifies deviations, additions or modifications
- Specific names and organizations responsible for managing the data
- Site specific procedures/checklists/SOPs

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ENVL

Site-Specific Data Management Plan

Project Name:		TDD Number/Site ID:	
Author:		Company:	
Date Initiated:	Click here to enter a date.	Last Updated:	Click here to enter a date.

This data management plan (DMP) is intended to provide guidance for data collection by field personnel and subsequent data management activities. The data collection and management practices presented in this plan are designed to ensure data integrity and consistency for all data collection personnel and from operational period to the next. This document is intended to be used in conjunction with a Region-wide data management plan and only includes the details specific to the site. There may be appendices.

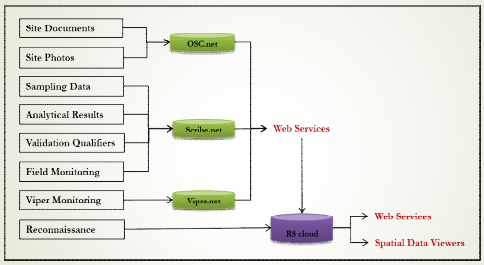
Data Processing:
The following table outlines the specific requirements for various data types being collected during the project.

	Data Input	Data Stream	Data Source	Site Specific Data Elements	Site Specific Verification	Site Specific SOP
1.						
2.						
3.						
4.						
5.						

	Reporting Task	Data Inputs	Data Transformation SOP	Deliverable Format(s)	Frequency
1.					
2.					
3.					
4.					
5.					

Data Workflow

ENVL



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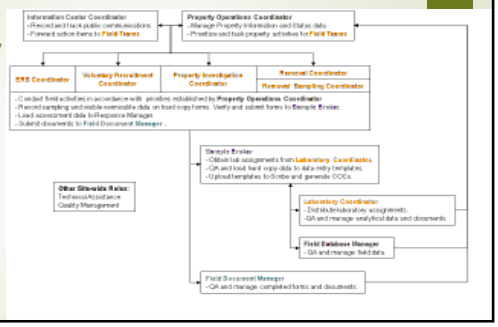
Roles & Responsibility

ENVL



Data Elements & Valid Values

ENVL

- Core of your site specific plan
- What data you need & what it needs to look like
- Enforce consistency
- Develop feedback loops from your data users to your data managers
- Implement methods to enforce the data requirements established by the site
- Define what values mean!

ICS INSTITUTE EPA

Standard Procedures

ENVL

- Consistency requires discipline & documentation
- Any processes or task that can be documented related to how data is collected, stored, or analyzed should be
- Checklists are a huge help

ICS Institute EPA

Data Storage

ENVL

- Where is the data?
- Who is in charge of it?
- How does it get there?
- How often is it updated?
- How can other people access it?
- Has the data been checked against the data requirements?

ICS Institute EPA

Data Reporting

ENVL

- How are you going to use the data?
- Data streams can be reported many different ways depending on the audience
  - Orphan container recovery
    - ✓ SITREP is going to identify the total number of containers collected
    - ✓ OPS just needs a report on where their teams went the previous day to plan the next day's collection activities
- Feedback loop needs to exist to inform the project on what data needs to be collected

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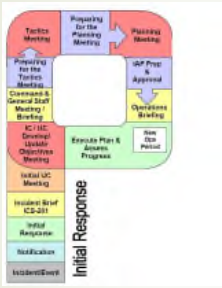
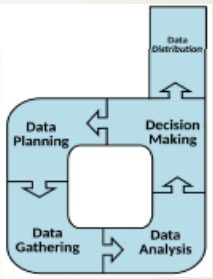
Data Management within ICS

ENVL





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Command - IC

ENVL

- Determine incident objectives and coordinate with the Regional Incident Coordinator (RIC) to implement management objectives.
- Maintain clear and effective information sharing with the RIC.
- Approve the release of information to the news media and public in coordination with the Public Information Officer (PIO), Headquarters PIO (if established) and the Office of Public Affairs (OPA).

ICS Institute

Command - PIO

ENVL

- Release information about the incident to the news media and the public upon approval by the IC and in coordination with the HQs OPA.
- Working with data management specialists and GIS analyst to determine best way to post and display data on public website

Operations is key to data management

ENVL

- Operations collects the samples
- Operations operates the monitoring instruments
- Operations digs up the dirt
- Operations collects the oil
- Operations plays a significant role in data management for a response
- Operations is in the best position to verify the data collected was accurate

ICS Institute EPA

OPS - Single Resource Leader for Field Data Management

ENVL

- Capture, record and/or otherwise collect field data and information.
- Process, verify and report field data and information to the Situation Unit.
- *Could have multiple depending on geographic distribution and size of response*

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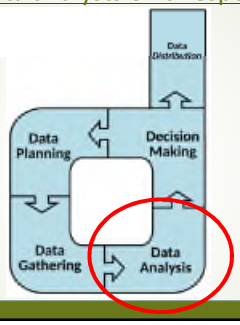
Situation Unit and Environmental Unit are the primary data analysts on a response

ENVL



ICS Institute EPA

PLAN/SIT - Data Management Specialist

ENVL

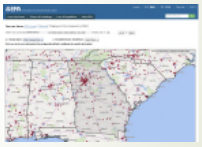
- Administer the incident database(s).
- Provide appropriate information for situational and environmental reporting.
- Ideally embedded within Operations
  - Control point for data and for physical samples
  - COC generation

ICS Institute EPA

PLAN/SIT: Geographic Information Systems Specialist

ENVL

- Gather and compile updated information and provide map products.
- GIS Web viewers & spatial analysis
- *May be an off site resource*



ICS Institute EPA

PLAN/Environmental Unit: Sampling & Monitoring Plan Coord.

ENVL

- Develops and maintains a Quality Assurance Project Plan (QAPP).
- Documents the data quality objectives (DQOs)
- DQOs drive:
  - Data Elements
  - Valid Values
  - Risk analysis
  - Spatial data analysis approach
  - Incident decision making
- Coordination between QAPP & DMP is critical

ICS Institute EPA

PLAN/Environmental Unit: Quality Assurance Coordinator

ENVL

- Perform quality assurance activities and advise response personnel on quality assurance issues and limitations on the use of data.
- Facilitate delivery of Validated Electronic Data Deliverables for Analytical Data
- NOTE: The responsibilities of the Quality Assurance Coordinator may be performed by HQs during nationally-significant incidents.

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PLAN/Analytical Coordinator

ENVL

- Schedule all environmental sample analyses, utilizing EPA and other Federal, academic, and private laboratories as necessary
- Ensure laboratories have capabilities to meet data delivery requirements (Lab EDDs) consistent with the SSDMP
- Track expected receipt of analytical results from laboratories
- Provide Sampling and Monitoring Plans as requested, and review and approve of the procedures developed by the Operations Section

ICS Institute EPA

PLAN/Environmental Unit: Data Assessment & Interpretation Coord.

ENVL

- Interpret environmental data and identify data gaps.
- Prepare data for internal use and public consumption.
- Working with Data Management and GIS Specialist to identify data reporting needs, automation opportunities
- NOTE: The responsibilities of the Data Assessment and Interpretation Coordinator may be performed by HQs during nationally-significant incidents.

ICS Institute EPA

SITREP

ENVL

- Data driven documents
- Manage and aggregate updates from every part of the organization
- Develop a process to receive metrics covering different areas of the response:
  - Cost
  - Personnel on-site
  - Ops activity summaries
    - ✓ Containers recovered
    - ✓ Samples collected

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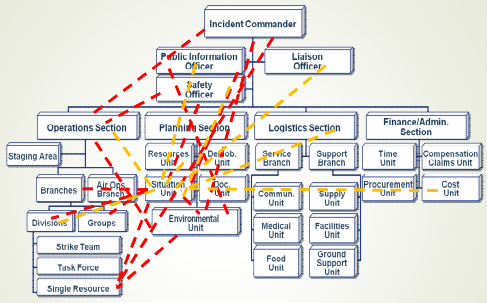

ENVL

Command Staff: Data Support Coordinator

ENVL

- Evaluate Incident Objectives and develops an incident-specific Data Management Plan.
- Establish an appropriate data management organizational structure to achieve incident objectives and assist unit leaders with the tasking of personnel to ensure the effective implementation of the incident-specific Data Management Plan.
- Ensure that data management activities support data and information transparency across various organizational levels: IMT, EPA Management, Stakeholders, Public, etc.
- Ensure that data summaries and reports support the internal and external release of data and information.
- Serve as the primary point of contact for all data management issues and needs for the response.

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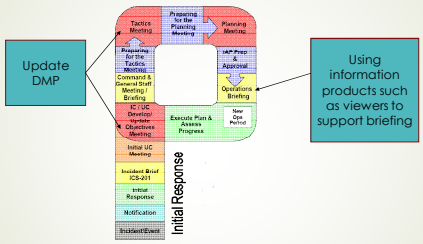
Data & Planning Process

ENVL



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SIT & Environment Feedback

ENVL

- As the primary data consumers on the response your feedback is critical
- Identification of data consistency issues
- Additional data requirements you need to pass onto the data collection process to assist with your analysis
- Changes and additions to strategic plans like the QAPP that will have an impact on data collection

ICS Institute

ENVL

EPA Field Data Management Tools

ICS Institute

Objectives

ENVL

- Translate all field work into electronic data
- Match the data we are collecting to our Data Quality Objectives
- Be able to describe your process and your requirements so that other stakeholders can use your data and hopefully share data with you
- Prepared to the move the data as fast as possible
  - Collection to display
  - From EPA to response partners

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Complex Problems, Complex Solutions, Standard Approach

ENVL

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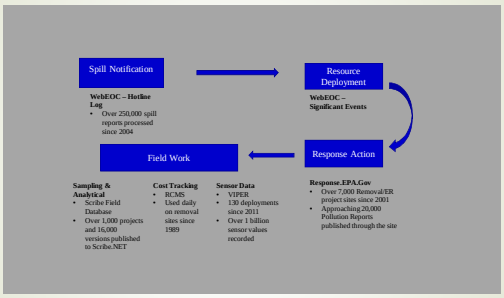
ENVL



Incident Notification - WebEOC

ENVL

- Documents EPA's initial response to notifications from NRC
- Significant events – deployment of an EPA asset

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Site Information – Response.EPA.Gov

ENVL

- Content management system controlled by OSCs for Removals and ERs
- Hosts SITREPs, Images, Documents
- Access to the site is and content is controlled by the OSCs
- Evolved from a field tool into the data source for the Removal Program on progress metrics

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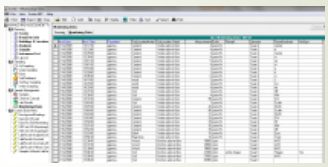
Sampling and Analytical Data - Scribe

ENVL

- Field data management workhorse
- Sample documentation
  - Labels
  - Chain of Custodies
- Local database allows complete customization and control by the field project managers
- Program wide implementation



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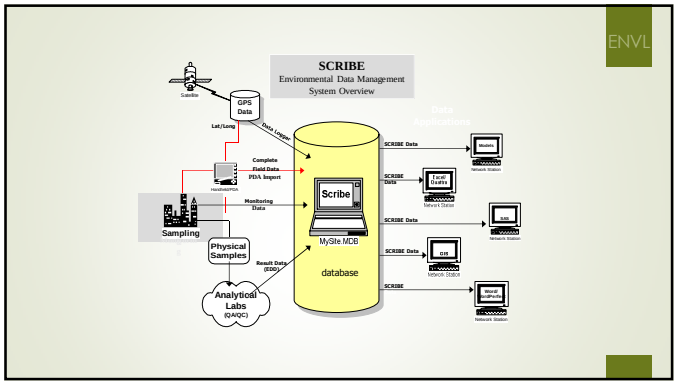

Data Auditor

- Create custom auditing rules for one or more sites
- Allows you to check your project against defined valid values and

Environmental Response Team

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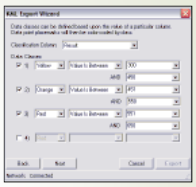
Visualization



- Turn the results of your query into a quick map with one-click
- Exports a KML file which you can view in Google Earth and ARC GIS
- Set symbology & height based on the values of a field

Environmental Response Team

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Scribe.NET

ENVL

- Allows us to move Scribe data while maintaining benefits of local ownership of the site project
- Scales – ownership is compartmentalized
- Delivers data to the enterprise
- Allows for intricate data management workflow without complicating the field project owners job
  - Manage the data in front of you

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Multiple Project Scribe Subscription

ENVL

- User enters subscription ID/Password into Scribe
- Must be manually refreshed
- Downloads all the versions for each of the projects and processes them one at a time to "build" the combined projects
- Scribe interface filters based on Site Number
- Conflicts can be created if multiple projects have the same primary key values for records
- Download time dependent on the number of versions and data sets

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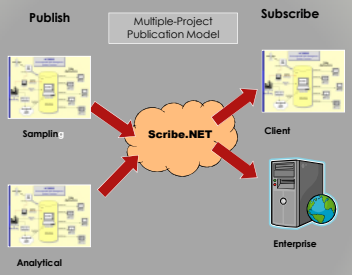
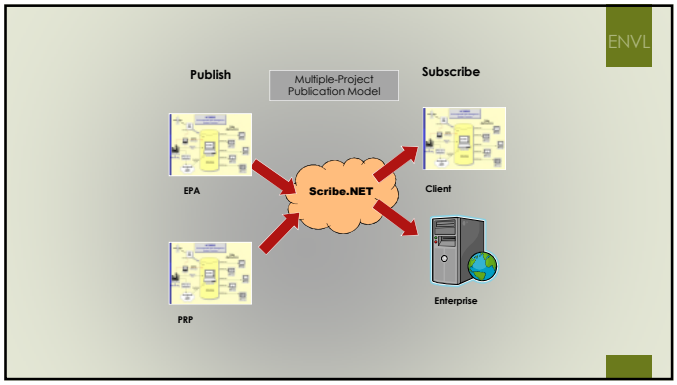
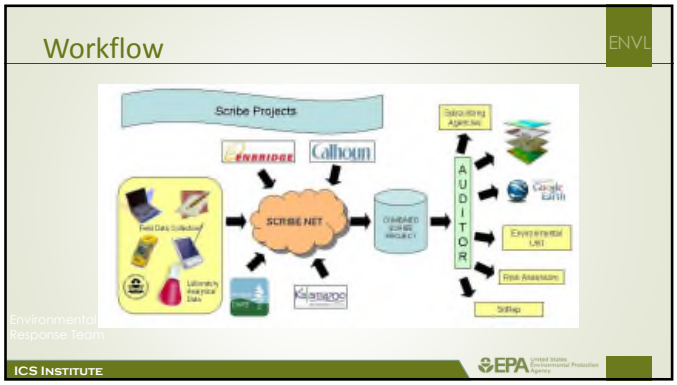
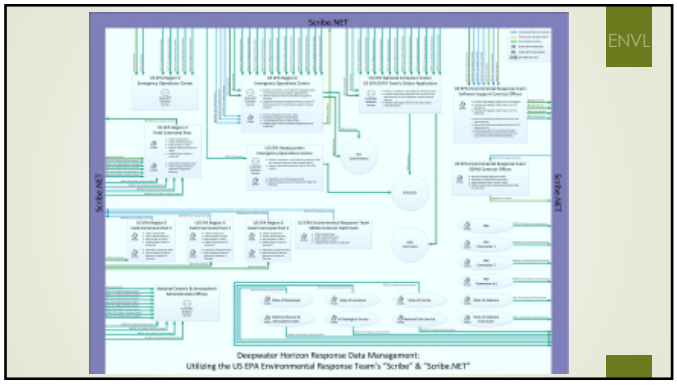



ENVL
Publish
Multiple-Project Publication Model
Subscribe
EPA
Scribe.NET
Client
PRP
Enterprise


Workflow
ENVL
Scribe Projects
SCRIBE.NET
AUDITOR
Environmental Response Team
ICS INSTITUTE
EPA


ENVL
Deepwater Horizon Response Data Management:
Utilizing the US EPA Environmental Response Team's "Scribe" & "Scribe.NET"

Sensor Data Issues for Superfund

ENVL

- Volume of data
- Real-time doesn't always mean "real-time"
  - Data from PRP operated sensors is delivered to EPA using the same report based approach delays delivery
- Raw data doesn't correspond to our evaluation criteria
  - Instantaneous readings versus action levels based on periods of time (AEGL, PELs, etc.)
- Time required to acquire, store, transform and re-format for dissemination
  - Increases contractor cost
  - Delay in sharing information with the public can pose challenges to most effective communication

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VIPER

ENVL

- System was built to handle the unique volume and real time utilization requirements inherent to sensors
- Based on federal data standards
- Adding new types of sensors requires no core system modifications
- Secure live view of the data via the web
- System monitors the data and determines exceedances, sending out notifications in real-time

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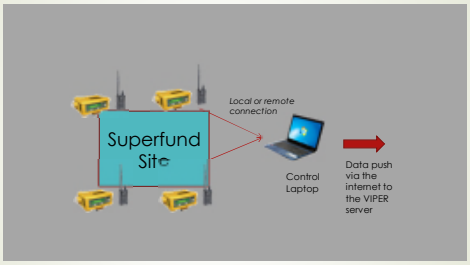
Workflow

ENVL



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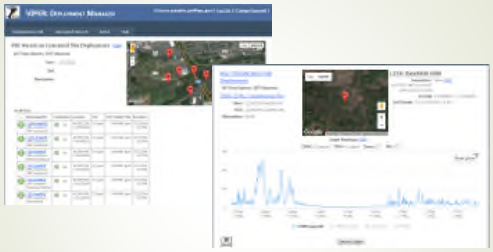
Web view

ENVL



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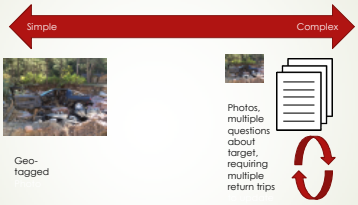
Recon Data

ENVL



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Keeping Recon Approach Flexible

ENVL

- If using forms, have a system that allows rapid generation and distribution
  - Testing with Filemaker Pro forms for iOS
- Be able to work local or connected depending on resources that are available
- Be willing to scale down if the approach calls for it

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Bringing It All Together

ENVL

- Each system is capable of delivering data both to an end user and other applications
- These live data feeds enable the EPA Region to easily bring that data into a GIS environment in real-time

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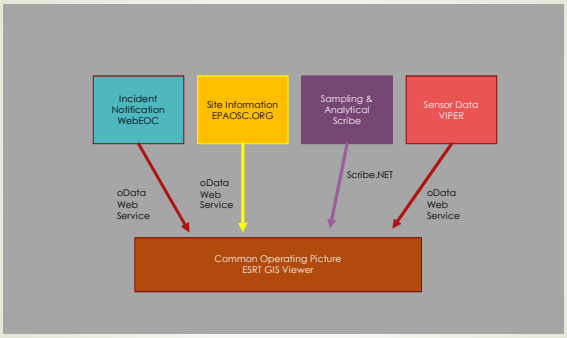
ENVL



Common Operating Picture

ENVL

- Information flow is too dynamic to only rely on printed maps
- Need an interactive map that is capable of incorporating multiple data streams with live updates
- Needs to be hosted somewhere were all response partners can view the information
- Process needs to exist to rapidly develop and deploy COPs for incidents
- Each Region is provided hosting space on Amazon as part of the ER Cloud to support their COPs

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Data Management Support Resources

ENVL

- Data Team
  - Daniel Burgo, R1
  - Eric Delgado, R6
  - Martin Mccomb, R8
  - Randy Nattis, R10
  - Jeff Pritchard, R7
  - Stephanie Wenning, R3
  - Joe Schaefer, ERT
- ERT Software Support
  - 1-800-999-6990
  - ertsupport@epa.gov

ICS Institute EPA

PIO/ ENVL

PIO Unit 5/ENVL Unit 10

PIO Coordination with the EPA Environmental Unit

ICS Institute EPA 1

PIO

Unit Terminal Objective

Describe the coordination needed between the PIO and the Environmental Unit based on EPA guidelines

ICS Institute EPA 2

PIO

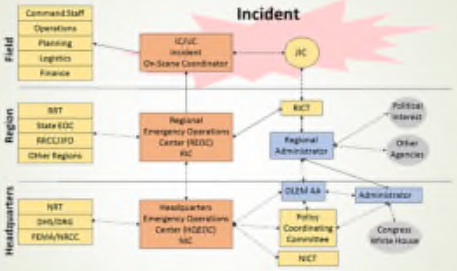
Unit Enabling Objectives

- Describe the duties of the Environmental Unit Leader within the ICS system
- Describe the relationship between the Environmental Unit and the PIO
- Discuss CCP & Playbook for Data Management Personnel

ICS Institute EPA 3

It's Important, It's Complicated

PIO



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4

Incident Command System

PIO

SINGLE COMMAND

Command Staff

OPS | PSC | LSC | FSC

UNIFIED COMMAND

A | B | C

Command Staff

OPS | PSC | LSC | FSC

ICS Institute

EPA

5

Environmental Unit Leader

PIO

- General Command in the Planning Section under the Environmental Unit Leader
- Depending upon the size of the response, a HQ EOC Environmental Unit may be established
- ***Environmental data management is a crucial area of environmental response. It is the basis for meaningful risk communication with the public and other first responders***

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EPA

6

Environmental Unit Leader

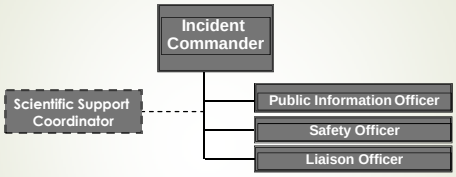
PIO

- Responsible for scientific support:
  - data management, monitoring, sampling and analysis
    - ✓ Sampling and Analysis Plans
    - ✓ Quality Assurance Control Plans
  - Modeling & data interpretation
  - Natural resources and ecological issues

ICS Institute EPA 7

The Command Staff

PIO



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Public Information Officer

PIO

- Member of Command Staff
- Represents and advises the IC on all public information matters related to the management of the incident
- Fulfills duties and roles in EPA Order 2010

ICS Institute EPA 9

What you should know going in…

PIO

- Communication of data is one of the most important and challenging response activities
- Historically, there have been some tensions between incident response and public affairs, but through education and collaboration (such as this ICS Academy) we can change this dynamic
- Developing Risk communications using ER data is challenging

ICS Institute

What you should know going in…

PIO

- Interpretation of data is complex, and often impacts policy and national consistency
- Don't forget plain language, literacy and translation
- Be cautious in how we release data – there are privacy implications (PII) with personal information scattered throughout data collection

ICS Institute

What you should know going in…

PIO

- We are on the leading edge of data management technology and we have a growing use of infographics; using Geo-platforms to display data is an important tool
- In an age where we strive for transparency, using quality controlled (verified) vs. preliminary (raw) data remains a challenge, and the agency is still evolving on this issue
- WHEN IN DOUBT - PUBLIC SAFETY RULES

ICS Institute

Public Information Officer and Data

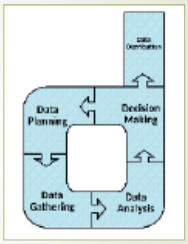
PIO

- Start thinking about data **before** you deploy
- Read the regional Data Management Plan(s)
- Communicate with Environmental Unit regarding data layout and timelines
- BE PREPARED. Your first question about data will come on day one
- Stay up-to-date on sampling efforts with Operations Unit

Public Information Officer and Data

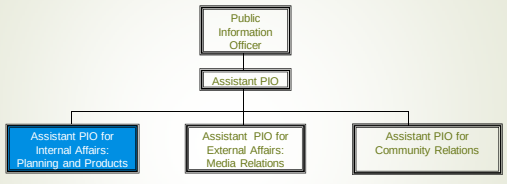
PIO

- Predict data communication needs
- Establish plan for data posting
- Document 'review, approve, release'
- Seek feedback from LNO regarding stakeholders



Typical PIO Organization Chart

PIO



Crisis Communication Plan

PIO

- AA OPA establish incident-specific process for release
- Senior Advisor ER Communications oversee 'review, approve, release' process
- EOC PIO coordinate with the EOC EU regarding data and their release
- EOC PIO coordinates with and seeks input from PIO and PAD
- EOC PIO coordinate the approval and release of data-related materials using the established 'review, approve, release' process

Environmental Data

PIO

Environmental Data:

- is collected from soil, sediment, air and
- needs to be disseminated to the public in a timely, understandable, accurate and consistent manner

The Playbook for Data Personnel describes core function of data and communications personnel

Environmental Data

PIO

- Most "Environmental Data" is gathered from either sampling, or from monitoring equipment. It's important to understand the difference(s):
  - Sampling involves collecting a sample that gets sent to lab where it is analyzed and results are ultimately provided. These results need to be quality controlled to be considered valid.
  - Monitoring typically involves obtaining information using direct-reading equipment, and sensors. This data is not, nor should it be confused with, laboratory data. Monitoring data is typically used to make immediate Health & Safety decisions, including evacuations, types of personal protective equipment that needs to be worn, etc.

Playbook for Data Personnel

PIO

- Integral to the Crisis Communication Plan
- Promotes data management activities
- Addresses data review and information sharing
- IC, RICT, RIC leadership on management, review and use of data
- Regional and national coordination to forward Agency's mission
- Fosters data and public affairs coordination and collaboration

ICS Institute EPA 19

ICS Positions

PIO

Incident Commander

- IMH page 7-2
- Determine incident objectives and coordinate with the Regional Incident Coordinator (RIC) to implement management objectives
- Maintain clear and effective information sharing with the RIC
- In coordination with the Public Information Officer (PIO), Headquarters PIO (if established) and the Office of Public Affairs (OPA), approve the release of information to the news media and public

ICS Institute EPA 20

ICS Positions

PIO

Command Staff:
Public Information Officer

- IMH pages 7-4 and 7-5
- Coordinate with OPA when required under the Crisis Communications Plan
- Gather incident data
- Determine, in consultation with the IC/UC and OPA, if there are any limits on information release

ICS Institute EPA 21

New ICS Position?

PIO

Data Support Coordinator

- Responsibilities may be performed by the Deputy Incident Commander and/or Technical Specialist assigned to the Command Staff or may be added to the ICS structure based at the discretion of the IC
  - ✓ May be added to Command Staff
  - ✓ May be added to the IMH

ICS Institute EPA 22

Data Support Coordinator

PIO

- Evaluate incident and Management objectives and develops an incident-specific Data Management Plan
- Determine an appropriate data and information management organizational structure to achieve incident objectives and assist unit leaders with the tasking of personnel to coordinate the effective implementation of the incident-specific Data Management Plan

ICS Institute EPA 23

Data Support Coordinator

PIO

- Coordinate that data management activities to support data and information transparency across various organizational levels
- Coordinate that data summaries and reports to support the internal and external release of data and information

ICS Institute EPA 24

Data Support Coordinator

PIO

- Serve as the primary point of contact for all data and information management issues and needs for the response

ICS Institute EPA 25

ICS Positions

PIO

Operations Section:
Single Resource Leader for Field Data Management

- IMH page 8-14
- Capture, record and/or otherwise collect field data and information
- Process, verify and report field data and information to the Situation Unit

ICS Institute EPA 26

ICS Positions

PIO

Situation Unit:
Data Management Specialist

- IMH page 9-7
- Manage and administer the incident database(s)
- Provide appropriate information for situational reporting

Geographic Information Systems Specialist

- IMH page 9-8
- Gather and compile updated information and provide map products

ICS Institute EPA 27

ICS Positions

PIO

Environmental Unit:
Sampling and Monitoring Plan Coordinator

- IMH page 9-16
- Develops and maintains a Quality Assurance Project Plan (QAPP)

Quality Assurance Coordinator

- IMH Page 9-15
- Perform quality assurance activities and advise response personnel on quality assurance issues and limitations on the use of data

ICS Institute EPA 28

Roles & Responsibilities

PIO

Playbook for
Data and Information Management Personnel

- Decision Making
- Data Planning
- Data Analysis
- Data Distribution
- Release Data

ICS Institute EPA 29

Data Distribution Roles & Responsibilities

PIO

Data Support Coordinator

- Identifies guidelines for release of data
- Insures guidelines are supported by DMP

PIO

- Coordinate with HQ and OPA the approval and release of data-related materials
- Ensures incident specific 'review, approve, release' is followed
- Communicates data products and schedule to Coordinator

ICS Institute EPA 30

Region and HQ Functions

PIO

Headquarters: Policy data release approval (national significant event), and Agency direction

Region: Integrated strategic management, overarching public messaging to ICPs, EPA Regional synchronization and coordination

Unified/Incident Command:

- Unified tactical response, EPA, State, Counties, Tribes, and local government
- Stakeholder engagement
- Blending of all levels of government with stakeholders

ICS Institute EPA 31

Region and HQ Positions

PIO

Headquarters Emergency Operations Center (HQ EOC)

- EOC staff, specific HQ Office Desks, and HQ Environmental Unit
- IMH page 2-6
- Serves as primary hub for receiving and disseminating national level information about the incident
- Be the official channel for the flow of data and information between the Regions and Headquarters

ICS Institute EPA 32

Region and HQ Positions

PIO

Headquarters Emergency Operations Center (HQ EOC): EOC PIO

- Coordinate with EOC Environmental Unit regarding data and their release
- Coordinate with and seeks input from field PIO and PAD
- Coordinate approval and release of data-related materials using 'review, approve, release'

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Region and HQ Positions

PIO

Data Management Coordinator:

- A position in OEM, Preparedness and Response Operations Division (PROD) and the lead of the HQ Environmental Unit

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Data Management Coordinator

PIO

- Leads and coordinates the processing of data and information at Headquarters
- Provides appropriate data and information products to other HQ offices so they many fulfill their responsibilities
- Coordinates early and consistently with the Regions and the IC/UC Data Support Coordinator concerning data and information needs and responsibilities

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Data Management Coordinator

PIO

- Establishes an appropriate data and information organizational structure to achieve Headquarters objectives and properly implement the OEM Emergency Response Data and Information Plan
- Coordinate data and information transparency across various Headquarters organizational levels and coordinate issues and various uses of the data at Headquarters

ICS Institute EPA 36

Data Management Coordinator

PIO

- Coordinate data summaries and reports support the internal and external release of data and information with PIO
- Serve as the primary point of contact for all data and information issues and needs for Headquarters
- Coordinate with PIO and Public affairs on data and information release to public and media

ICS Institute EPA 37

Region and HQ Positions

PIO

Associate Administrator of the Office of Public Affairs

- AA OPA has ultimate decision-making authority for public information matters on behalf of the Administrator
- Establish an incident-specific 'review, approve, release' process to be used for the public release of agency information pertaining to the incident

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Region and HQ Positions

PIO

Senior Advisor for Emergency Response Communications

- New position in OPA
- May be added to IMH
- Oversee the "review, approve, release" process during the incident

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Review, Approve, Release Process

PIO

Review

- Define the review process for the response
- Coordination between the technical review, risk assessment and public messaging
- Identify pathway for data corrections and updates

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Review, Approve, Release Process

PIO

Approve

- Identify the process for data review on the response
- Define conditions for data being approved/rejected
- Develop feedback mechanism so incident personnel know what data has been approved for public release

ICS Institute EPA 41

Review, Approve, Release Process

PIO

Release

- Identify different formats for releasing data (spreadsheets, maps, tables, etc.)
- Coordinate between incident and HQ on the status of data products release
- Notify incident personnel when data products are released to the public

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Wow! That is a lot.

PIO

- EPA successfully responds to thousands of incidents each year
- The ICS system works, trust it
- More eyes, more discussion, fewer errors
- It will always take more time than everyone wants – be patient
- Be flexible – change is certain
- Work as a team

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Overall Data Communication Challenges

PIO

- Difficult to come to consensus internally and externally
- Complex data may be difficult to categorize/summarize
- Time crunch during an emergency becomes an issue
- Need to be true to the science but easy to understand (which is nothing new)

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PIO

ACTIVITY

ICS Institute EPA 45

ENVL

Environmental Unit Leader
Unit 11

ENVIRONMENTAL MODELING

Objectives

ENVL

- Understand the duties and responsibilities for the ENVL in regards to environmental modeling.
- Have an awareness level understanding of;
  - what a model is?
  - the types of products that can be generated by a model,
  - the types of Environmental modeling available.
- Know when IMAAC is required and how to access them.
- Know who to contact for modeling support

Responsibility of ENVL

ENVL

- Provide appropriate technical advice and consultation to the Planning Section, Operations Section, and the IC in support of the decision making process, which may include….. Environmental Modeling. (IMH page 9-12)
- Determine staffing requirements and the need for technical specialists. (IMH page 9-11)

Modeling Technical Specialist

ENVL

- Modeling Analysis Coordinator (IMH p 6-7)
- The Major responsibilities of technical specialist may include… Modeling
  - Air, groundwater, surface water
  - Discharge from a point source
  - Oil trajectory
  - Contaminant fate and transport (IMH pp6-7&8)

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Modeling Analysis Coordinator cont.

ENVL

- Provide expertise in air dispersion plume modeling.
- Provide expertise in environmental statistical sampling models.
- Provide expertise in developing oil spill trajectories.
- Provide expertise in groundwater and vadose zone modeling.

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Groundwater Modeling: An Introduction

ENVL

- Terrence Johnson- ERT

ICS Institute EPA 6

What is a Groundwater Model?

ENVL

- Is designed using a computer software to represent a simplified version of a groundwater system.
- A model predicts the spatial distribution of unknown variables such as groundwater head or contaminant concentration.
- A model is as good as the conceptual model and the accuracy with which it mimics reality (calibration and verification)

Types of Models

ENVL

- Mathematical Solution Types:
  - Analytical solutions: simplifying assumptions, simplified boundary conditions (BC), limited data needs, screening applications
  - Numerical solution: highly complex, high data needs, handle complex boundaries, need expert modeler, output more reliable

Types of Models Cont'd

ENVL

- Dimensionality: we live in a three dimensional world, but modes may be
  - 1-, 2- or 3-dimensional
- Dimension dispends on site conditions, objectives, data availability, and resources
- Time Component: Models may either be steady state—no change in variables with time—or transient (time variant)

Generic Modeling Applications

ENVL

- Reconnaissance or Screening: uses regional (as oppose to site specific) model parameters, and data; typically used to evaluate field conditions prior to field investigation, or other screening applications
- Interpretive: uses site data bill a robust model of the interactions of geology, groundwater and contaminant transport to understand the system and identify data gaps.
- Predictive: uses a sound model to predict groundwater system behavior, e.g., will a benzene plume from a gasoline spill impact a nearby well, and if so, how long will it take; or to aid the design of a well field to intercept the plume.
  - Often times interpretive and predictive modeling are done sequentially.

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Contaminant Transport Typical in Environmental Applications

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- groundwater flow and contaminant transport equations solved sequentially.
  - First: Groundwater Flow Model
  - Second: Contaminant Transport.

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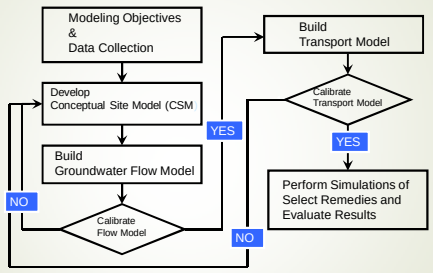
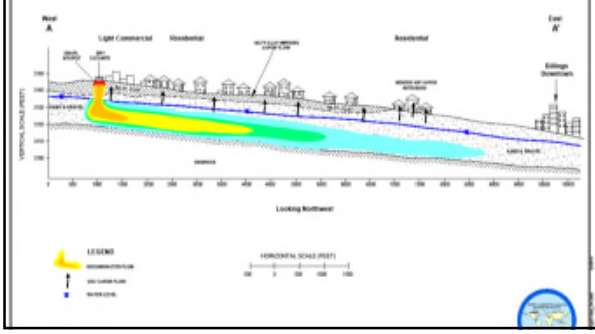
Modeling Flow Chart

ENVL



CSM—Cross Section



Flow Model Calibration

- Compare model variable of interest (groundwater elevation, or concentration) to field data
- Build model credibility: qualitative and quantitative model calibration are generally used.
  - Qualitative: model result should reproduce observed real-world features (groundwater divides, mounds/depressions, plume shape, etc)
  - Quantitative: predicted and observed should meet predefined statistical criteria—normalized root mean square error, and coefficient of correlation thresholds.

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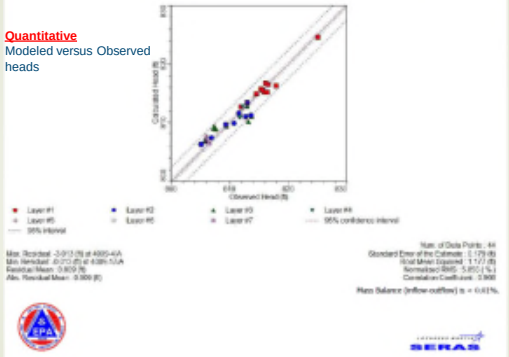
Quantitative
Modeled versus Observed heads



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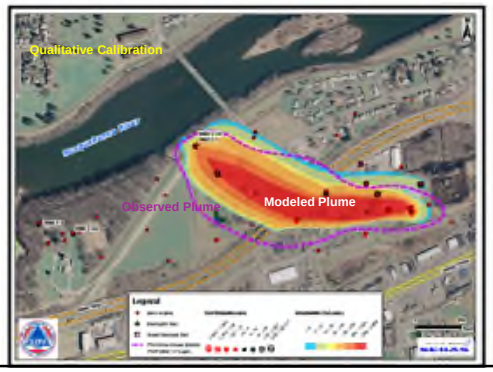
Calibrated and Observed TCA Plume at 35 yrs



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Model Validation

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- Further builds model credibility
- The calibrated models are used to predict an independent set conditions/stresses from the calibration set.
  - For example, if the model was calibrated under a no pumping scenario, validation could be done under a pumping scenario.
- Compares observed and simulated results quantitatively and qualitatively as with calibration.
- Often times, an independent data set is unavailable; hence validation not done.

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Actual Model Development Information

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- Contact: Terrence Johnson, ERT
- Telephone: (702)-419-5409 (o); &02-496-0703(c)
- Email: Johnson.Terrence@epa.gov

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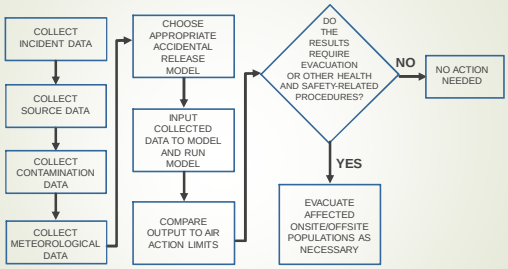
DISPERSION MODELING DURING AN EMERGENCY



IMAAC

Interagency Modeling and Atmospheric Assessment Center

Distribution Statement A
Approved for public release; distribution is unlimited

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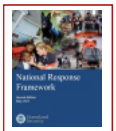
IMAAC MISSION

Provide a single point for the coordination and dissemination of Federal dispersion modeling and hazard prediction products that represent the Federal position during actual or potential incidents involving hazardous atmospheric releases.

Homeland Security Council Memorandum 2004



Memorandum of Understanding between all IMAAC member agencies

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IMAAC MODELING TOOLS

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DoD/DTRA • HPAC **EPA** • CAMEO/ALOHA **NOAA** • CAMEO/ALOHA • HYSPLIT	**HHS** • Population modeling **DoD/DTRA** • HPAC	**DOE/NNSA** • NARAC **DoD/DTRA** • HPAC **EPA** **NOAA** **NRC** • RASCAL	**DoD/DTRA** • HPAC • VAPO

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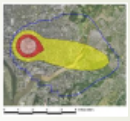
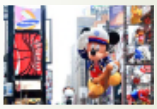
IMAAC SUPPORT & TRAINING

ENVL

- The IMAAC provides atmospheric modeling support for:
  - Real-world events
    - Emergencies
    - National Special Security Events (NSSEs)
  - Exercises
    - Vibrant Response – 10 kt IND scenario
    - Southern Exposure – NPP
  - Training
    - Webinars
    - On-site
    - Classroom (HPAC)





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IMAAC ACTIVATION SEQUENCE

ENVL

IMAAC Activated

↓

Initial IMAAC Products Distributed

↓

IMAAC Coordination Teleconference

↓

IMAAC Deactivated

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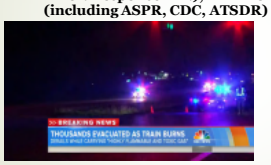
REAL WORLD IMAAC ACTIVATION

ENVL

- **Incident: July 2, 2015 CSX Rail Accident in Maryville, TN**
- **Activated by: FEMA National Watch Center at the request of the Tennessee Emergency Management Agency**
- **Interagency participation: FEMA (IMAAC Dir., National Watch, Region 4), 45th CST, EPA (Region 4 and HQ), State of TN (TEMA East, TDOT Rail, Dept. of Health), NOAA (SDM, Emer. Response Div.), MARNORTH CBRNE, U.S. Dept H&HS (including ASPR, CDC, ATSDR)**



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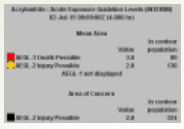
Acrylonitrile– Far View – Initial Response

ENVL

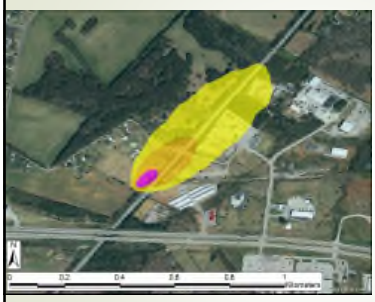


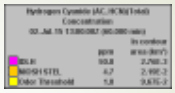
This quick response used a weather prediction model; and was not coordinated with other IMAAC participants. Coordination will follow, and product will be updated as needed.

- **Maryville, TN**
- Location: 35°45'27.56" N / 84°01'44.97"W
- Event Time: 0100 EDT, 02JUL2015
- Type: Acrylonitrile
- Amount: Single Tank Car
- Dissemination: Rail Accident
- Weather: 12 km NAM
- Model: HPAC 5.3
- Static Population Estimates: LandScan 2012

HCN Concentration – 0900 Local 2 July 2015
Updated product

ENVL





- **Maryville, TN**
- Location: 35°45'27.56" N / 84°01'44.97"W
- Event Time: 0100 EDT, 02JUL2015
- Type: Acrylonitrile (combusting to HCN)
- Amount: Single Tank Car
- Dissemination: accident (10 gal/min leak)
- Weather: 12 km NAM
- Model: HPAC 5.3
- Static Population Estimates: LandScan 2012

HOW TO ACTIVATE THE IMAAC

ENVL

▪The IMAAC is activated for current or potential real-world emergencies involving significant hazardous atmospheric releases. Contact information is listed below.

▪ANY Federal, State, Tribal, Territorial, or Local official can request the activation of IMAAC.

For Emergencies

IMAAC Operations (703) 767-2003
Email IMAAC@FEMA.DHS.GOV

For general inquiries and exercise support requests, please send an email to IMAACINQUIRIES@FEMA.DHS.GOV

Public website https://www.dhs.gov/imaac

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OTHER MODELING OPTIONS

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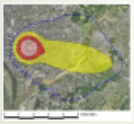
- Surface Water
  https://www.epa.gov/exposure-assessment-models/surface-water-models
- Oil Spills
  http://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/response-tools
- Air Screening
  https://www.epa.gov/cameo/aloha-software



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Unit 12

Environmental Unit Leader

Assessment & Cleanup

ICS Institute EPA 1

ENVL

Unit Objectives

- To understand the role of the ENV in
  - Assessing conditions
  - Assessing impacts related to an incident
  - Developing Endpoints
  - Developing response & cleanup strategies
  - Evaluating & selecting strategies
  - Select response and cleanup strategies to minimize impacts of incident
  - Developing cleanup plans
- Understand what SCAT is and how it fits into the ENV

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Assessing Conditions

- Identify Sensitive Populations/Areas
  - Human
  - Environmental
- Consult with Natural Resource Trustees
  - Natural
  - Cultural
  - Historical

ICS Institute EPA 3 3

Assessing impacts

ENVL

- Evaluate Impacts by
  - Sampling and monitoring
  - Visual Inspections
  - SCAT for oil
  - Modeling
- Short and long term ecological risk assessments

ICS Institute EPA 4 4

Developing Endpoints

ENVL

- ENVL Role – Identify & Recommend Preliminary:
  - Benchmarks
  - Criteria
  - Endpoints for Clean Up
- Final Decision to be made by IC/UC, or Regional Management

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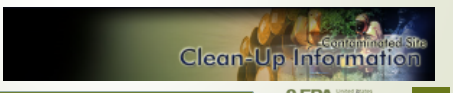
Developing Strategies

ENVL

- Identify Reasonable Options
  - Include No Action
  - Experience
  - Clue-in
  - Evaluation Matrices etc.
- Evaluate – Paper & Bench
- Recommend



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Evaluating & Selecting Strategies

ENVL

- Policy/Regulations
- Endpoints/Effectiveness
- Stabilization vs Remediation
- Implementability
- Cost
- Impact – Sensitive populations/areas, workers
- Political/Community/Stakeholder Concerns

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Monitor Consequences

ENVL

- Assessment/Response & Clean Up Actions
- Balance
  - Acute/Chronic
  - Short Term/Long Term
- Best Management Practices (BMP) to minimize

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Assessment & Clean Up Plans

ENVL

- Develop Plans
  - Work with Ops
  - Assessment
  - Clean Up
- Special Advisories

  example: how to deal with mold after a flood
- Orders

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Disposal Plans

ENVL

- Contaminated materials
- Process Residuals
- Transportation
- RCRA

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Shoreline Cleanup Assessment Technique

ENVL

- Evaluate oiling conditions
- Factor in shoreline types
- Identify sensitive resources
- Determine need for clean up
- Recommend clean up methods & endpoints
- Place constraints on clean up due to ecological, economic, or cultural concerns
  - https://docs.lib.noaa.gov/noaa_documents/DWH_IR/reports/NOAA_Oil_Spill_Response/scat.pdf

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SCAT – ENVL Duties

ENVL

- Initial Briefing
- General Guidelines
- Shoreline Treatment Recommendations

- Reference https://response.epa.gov/site/site_profile.aspx?site_id=7876

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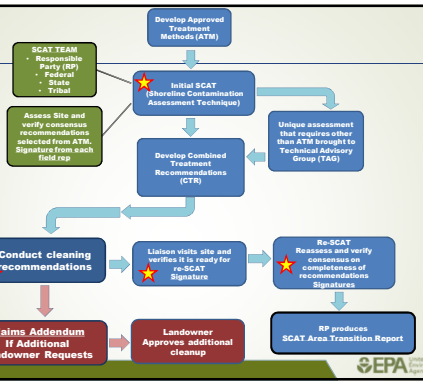
SCAT Process

ENVL

1. Initial SCAT Operations/ Cleanup
2. Combined Treatment Recommendation
3. Operations/Cleanup
4. Inspection
5. SCAT Reassessment
6. EPA Division Sign Off

ICS INSTITUTE EPA 13

ENVL



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Organization
Where does SCAT fit?

ENVL

Operations

- All field personnel are in Ops
- Ops is dependent on SCAT
- Ops Chief needs to make many of the "scattish" decisions

Planning

- Traditional/standard
- EU needs to vet SCAT the product
- EU needs info for long term planning

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Questions
ICS INSTITUTE
EPA
16
16

ENVL

Environmental Unit Leader
Unit 13

Technical Support

Unit Objectives

ENVL

- Evaluate if a resource is best employed onsite or in the reachback mode
- Know what resources are available in the Incident Command System
- Describe the 4 EPA special teams
- Know what regional resources are available
- List 3 EPA offices that can provide technical support

Objectives (cont.)

ENVL

- Identity other Federal partners that can provide technical support
- Identify State and other resources
- Understand special considerations in using technical specialist

Reachback vs. Onsite

ENVL

- Reachback – work from home office
  - One phone call
  - Remote part of the unit
- Onsite – work at incident
  - Incident Command Post
  - Other Incident locations

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Sources of Technical Support

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- EPA Special Teams
- Labs & Other Offices
- Outside EPA
  - Federal Partners
  - States
  - Locals
  - Academia/Private Industry

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Other ICS Resources

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- Regional ENV
- Area Command ENV
- HQ ENV

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U.S. EPA SPECIAL TEAMS

ENVL

Consequence Management Advisory Team (CBRN CMAT)

National Counter Terrorism Evidence Response Team (NCERT)

Radiological Emergency Response Team (RERT)

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EPA United States Environmental Protection Agency

EPA Special Teams

ENVL

- Environmental Response Team (ERT)
- Chemical, Biological Radiological Nuclear Consequence Management Advisory Team (CBRN CMAT)
- Radiological Emergency Response Team (RERT)
- National Criminal Enforcement Response Team (NCERT)

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EPA United States Environmental Protection Agency

8

Environmental Response Team (ERT)

ENVL

- ***Established in 1978 to provide Response and Remedial Program Assistance***
- ***Focus:*** "Classic Environmental" Emergencies
  - Sampling/Monitoring/Characterization
  - Risk Assessment
  - Hazard Evaluation
  - Responder Health & Safety
  - Lab & Analytical Support
  - Cleanup Technologies
  - Information & Data Management
  - Training & Education
- 28 experienced responders/technical experts + trained contractors

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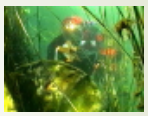
EPA United States Environmental Protection Agency

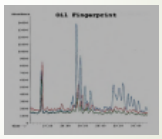
9

ERT Response Capabilities

ENVL

- Multi-matrix media monitoring, sample collection and analyses
- Mobile Analytical Laboratories
- Experienced team: Level A, B and C site work
- Radiation Surveys
- Experienced Scientific Divers
- Oil Spill Response and Forensic Fingerprinting
- Site Engineering; "Green" remediation technology
- Remedial Site Optimization studies
- Health and Safety Technical Assistance
- Data Management – SCRIBE
- Monitoring capabilities – VIPER





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ERT Assets

ENVL

- Mobile Labs and Resources
- Dive Unit – Sector and side scan sonar
- Geoprobe with MiHPT capabilities
- Radiation Resources – Gamma spectrometers, Neutron detectors, portable alpha and beta counters, microR meters, RAD 7 radon and thoron detectors, Genetrons, FIDLER low energy plutonium and uranium detectors; floor monitors, portal motors
- Counterterrorism sampling and monitoring – BTA 550, AP2C, ADP 2000, Lumex, SENSIR Travel/IR
- Oil Spills – Fluorometry
- Information Management Technology tools – WebEOC, VIPER, SCRIBE, PDA Scriblets

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ERT Mobile Laboratories/Resources

ENVL

- Trace Atmospheric Gas Analyzer (TAGA)
- Mobile Laboratory Platforms outfitted with appropriate analytical instrumentation
- Field Analytics – rapid turnaround, real time monitoring
- Response and Command Vehicles

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Radiological Emergency Response Team (RERT)

ENVL

- ***Established in 1971 to support federal, state, local and tribal response efforts for radiological or nuclear responses***
- ***Focus:*** Radiation Monitoring and Evaluation
  - Sampling/Monitoring
  - Hazard Evaluation
  - Planning Decontamination
  - Risk Assessment
  - Lab Analysis
  - Characterization
  - Cleanup
  - Waste Disposal
- 27-person forward team (All Feds)
- May deploy on own to support FRMAC/DOE or Advisory Team

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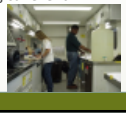
RERT Response Capabilities

ENVL

- Advice on protective measures - health and safety
- Assessments of dose and impact
- Monitoring, sampling, laboratory analyses and data assessments
- Technical advice / assistance
- Technical advice and assistance for containment, cleanup, restoration, and recovery following a radiological event.
- Limited level-A capabilities



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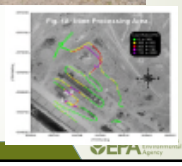
RERT Assets

ENVL

- Deployable Air Monitors
- Rad Net System
- Field Monitoring & Sample Collection Equipment
- Decontamination Equipment
- Public Information support
- Environmental Fate & Transport Modeling
- Data Quality Assurance, Assessment & Interpretation



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RERT Mobile Labs/Resources

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- Mobile Environmental Radiation Laboratory (MERL)
- Sample Prep Laboratory
- Mobile Command Post
- Mobile Scanning Systems (e.g. Scanner Van, Vegas Baby, ERGS)

- In-situ Gamma Ray Spectroscopy
- Exposure Rate Monitors (HPIC)
- Air Samplers
- Radiation Field Equipment

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US EPA Special Team for CBRN

CBRN Consequence Management Advisory Team (CMAT)

ENVL

- ***Mission:*** provides scientific and technical expertise for all phases of CBRN consequence management and is available to support the On-Scene Coordinators (OSC) 24/7
- ***Focus:*** Operational preparedness for CBRN agents (Chem/Bio/Rad Response Guides). Maintain ASPECT and PHILIS
- ***Support:*** All phases of CBRN response, including characterization, decontamination, clearance and waste management; interagency planning and preparedness projects; 16 member technical team

Buildings, infrastructure, indoor and outdoor environments, transportation sectors

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When to Contact CMAT?

EPA Emergency Ops Center - 24/7/365 @ 202-564-3850

ENVL

- Assistance with planning an exercise (field or TTX) with a CBRN component
- Assistance with developing or providing CBRN related training
  - Can provide mobile assets, large activity rad sources (gamma & neutron), plume generator, and interagency partners/resources for pre event or just in time training
- Technical questions related to CBRN
- Field support for emergency response or removal related to CBRN
  - CMAT can provide leadership to the TWG, EU, and/or SSC positions, depending on the incident.
  - Start to finish decon recommendations, planning, and coordination
  - Contamination assessment – ID, extent risk, and clearance
  - Development and justification of cleanup goals for chem, bio, and rad
  - Recommendation and implementation of decon technologies
  - H&S recommendations for WMD and large-scale events
  - Mobile assets and CBRN specific field equipment
  - In house laboratory support for chemicals, CWAs, and biologicals (BSL2+)
- Emergency Response or Special Event Deployments of ASPECT, PHILIS, and/or personnel

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PHILIS

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Portable High-Throughput Integrated Laboratory Identification System

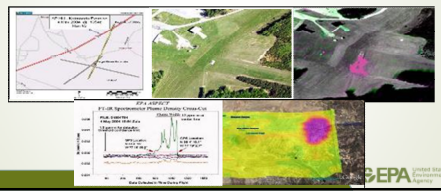
- PHILIS is EPA's mobile laboratory asset for on-site analysis for:
  - Natural disasters, accidental releases, terrorist and other unnatural incident response actions
  - Organic analysis in support of regional emergency response actions
  - NELAC Accredited & CWA Certified Laboratories
  - Mobile asset for EPA's Emergency Response Laboratory Network (ERLN)

"Brick and mortar" lab on wheels

ASPECT Operational Concept

ENVL

- Provide a readiness level on a 24/7 basis
- Provide a simple, one phone call activation of the aircraft
- Wheels up in under 1 hour from the time of activation
- Once onsite and data is collected it takes about 5 minutes to process and turn around data to first responders



ASPECT Operational Concept

ENVL

- Deployment Simplified:
  - Once on-scene collect chemical, radiological, or situational data (imagery) using established collection procedures
  - Process all data within the aircraft using tested automated algorithms
  - Extract the near real time data from the aircraft using a broadband satellite system and rapidly QA/QC the data by a dedicated scientific reach back team
  - Provide the qualified data to the first responder enabling them to make informed decisions in minimal time

National Criminal Enforcement Response Team (NCERT)

ENVL

- ***Mission:*** To provide evidence collection support for environmental crime investigations, and law enforcement support / liaison to the Agency during regional or national disasters and emergency responses.
- ***Focus:*** Environmental criminal investigations
  - All-hazards response (Levels A-D);
  - Contaminated crime scene management, processing, and evidence collection/decontamination;
  - Reach-back capability to National Enforcement Investigations Center scientific/ technical personnel
  - Law enforcement support/liaison

Established 2001

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How to Access Us

ENVL

Contact the Managers:

ERT – Harry Compton, Dee Valdes, Marc Greenberg

NCERT – Jimmy Seidel, Brandon Solari
RERT – Edward Wilds, John Griggs, Lee Veal

CMAT – Mike Nalipinski, Paul Kudarauskas

24 Hours – National Response Center –NRC 1-800-424-8802
EPA Emergency Operations Center (202) 564-3850

ERT
- (732) 321
- (732) 321

RERT
- **MERL: Sam Poppell, Team Commander – (334) 546-7214**
- **Field Response: Jeremy Johnson, Team Commander (702) 528-1740**

NCERT
- (303) 462
- (303) 4623

CMAT
- **Mike Nalipinski, Associate Director – (617) 680-5469**
- **Paul Kudarauskas, Chief of Field Ops Branch – (202) 344-5382**
- **24/7 via After Hours Watch Officer – (202) 564-3854**

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Regional Assets

ENVL

- Other Offices
  - RCRA
  - Water
  - Air
- GIS Experts
- Emergency Operations Center
- Technical Experts

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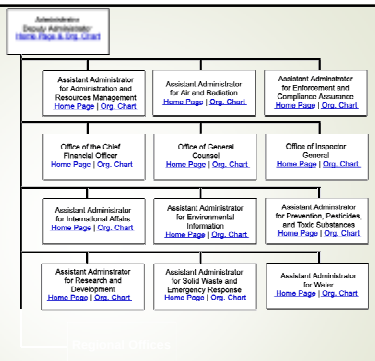
Other EPA Offices



National Homeland Security Research Center (NHSRC)

ENVL

- Decontamination and Consequence Management(Safe Buildings)
  (Contact: Shawn Ryan, 919-541-0699*)*
- Water Infrastructure Protection
  (Contact: Hiba Ernst, 513-569-7943*)*
- Threat & Consequence Assessment
  (Contact: Tonya Nichols, 513-569-7943*)*

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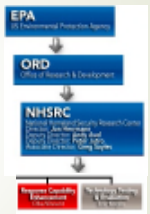
National Homeland Security Research Center (NHSRC)

ENVL

- Response Capabilities Enhancement
  (Contact: Oba Vincent 513-569-7456)
- Technology Testing and Evaluation Program
  (Contact: Eric Koglin 702-798-2322)



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Federal Partners

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U. S. Coast Guard
FEMA
ATSDR
DOD
DOE
FBI
DHS
FBI & WMD
DOI
NIOSH
NOAA
U.S. ACE
US Geological Survey

United States Coast Guard
U.S. Department of Homeland Security

US Army Corps of Engineers

Homeland Security

ATSDR Department of Health and Human Services Agency for Toxic Substances & Disease Registry

State-Level Resources

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- State EPA/Dept of Ecology, etc.
- Health/Water Departments
- State Fire Marshal
- State Law Enforcement
- Office of Emergency Services, Department of Emergency Management
- Department of Transportation

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Local Government Resources

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- Haz Mat Techs
- Environmental Health
- Emergency Services
- Planning/Building Dept
- Public Works
- Health Departments

Private Resources

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- Academia
- Professional/Trade Organizations
- Responsible Party
- Contractors

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Fitting into the ENVL Organization

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- Assistants
- Coordinators
  - QA
  - Modeling Analysis
  - Health Assessment
- Technical Specialists

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Care & Feeding of Tech Resources

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- Many are not accustomed to emergency operations & pressures
- Know if they are H&S certified
- Inquire about their required or preferred support and explain your limitations
- A good briefing required!

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Summary

ENVL

- Know your needs
- Use a wide array of sources
- Manage your resources
- Don't try to do it all

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Resource Trustees

ENVL

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Objectives

ENVL

- Understand the Role and Duties of the ENVL in regards to Resource Trustees
- Know who the Trustees are
- Know how to access Resource Trustees

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Regulatory Requirement

ENVL

- Under CERCLA, EPA's NRD role is one of notification and coordination. EPA is required to notify Trustees of potential injuries to natural resources at sites where releases or threats of releases are under investigation. EPA is also required to coordinate assessments, investigations and planning with Trustees [CERCLA §104(b)(2)]. In addition, EPA is required to notify Federal Natural Resource Trustees of negotiations with potentially responsible parties (PRPs) and to encourage their participation in negotiations, if the release under investigation may potentially injure Trust Resources [CERCLA §122(j)(1)]. Under OPA, EPA is the lead agency in responding to oil spills in inland waters.

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Natural Resources & Ecological Issues

ENVL

- Environmental impacts (e.g. , seafood tainting, wildlife impacts
- Identification of natural resources (e.g. wildlife, habitats, sanctuaries, and refuge areas)
- Historic and cultural resources
- Wildlife protection strategies
- In addition to regulatory notification, Trustees can assist in the identification and assessment.

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Types of Trustees

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Federal

State

Tribal

Other

https://www.epa.gov/superfund/natural-resource-damages-trustees#other

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Federal Trustees

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- Department of Agriculture (USDA)
- Department of Commerce (DOC) - NOAA
- DOD
- DOE
- DOI

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State Trustees

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- Examples of resources under the trusteeship of individual State officials include:
- State forest lands;
- State-owned minerals;
- State parks and monuments;
- State rare, threatened, and endangered species; and
- State wildlife refuges and fish hatcheries.

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Tribal Trustees

ENVL

- Examples of resources under the trusteeship of Tribal groups include:
  - Tribal-owned minerals;
  - Ground and surface water resources on Tribal lands; and
  - Any other natural resources found on Tribal land.

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Other Trustees

ENVL

- Under OPA, foreign officials can also act as Natural Resource Trustees. The head of a foreign nation must pick the official to act as Trustee [OPA §1006(b)]. The foreign Trustee can act on behalf of the foreign government only for natural resources "belonging to, managed by, controlled by, or appertaining to such foreign government" [OPA §§1006(a)(4), (b)(5)].

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Trustee Notification

ENVL

- EPA's Trustee notification and coordination efforts focus on achieving three goals:
- Providing Trustees with the information needed to meet their legal obligations for action.
- Sharing information to better protect public health and the environment.
- Reducing the time for settlement of all liabilities.

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QUESTIONS?

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Environmental Unit Leader
Unit 14

RISK ASSESSMENT

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Instructor Introduction

ENVL

- Philip Turner / Risk Assessor / Region 6 / R6 Incident Management Team, ENVL
- 10 Years of ENVL-related experience
- Gold King Mine Spill; Deepwater Horizon

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Review of Environmental Unit Responsibilities

ENVL

- Data Management – processing, Quality Assurance/Control, Interpretation
- Plan Development – Sampling & Analysis, cleanup, disposal
- Environmental modeling & interpretation
- **Human Health and Ecological Risk Assessments**
- Identify Sensitive Areas and Populations
- Communicate Sampling, Toxicity and Risk Results
- Coordinate with similar related entities

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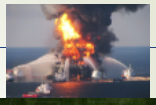
Survey Current Incident Status

ENVL

- Size / Scope
- Current Activities
- Contaminants of Concern
- Threats
- Sensitive Areas
- Populations
- Conceptual Site Model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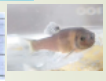
Survey Anticipated Scientific Needs

ENVL

- Modeling
- Interpretation
- Threat/Risks to human health and environment
- Sampling
- Toxicity Testing
- Response









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Objectives for this Training Unit:

ENVL

1. To gain an appreciation of the different components involved in human health (HHRA) and ecological risk assessments (ERA) as summarized in the *ENVL Job Aid*
2. To obtain a working knowledge of what are and where one can find action levels for different potentially exposed populations
3. To provide discussion on where an ENVL can obtain information necessary pertaining to HHRA and ERA

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Human Health Risk Assessments

ENVL

- The Environmental Unit will perform short- and long-term human health risk assessments, as appropriate, to determine action and cleanup levels. Human health risk assessments activities include the following:
  1. Evaluate preliminary benchmarks and criteria , and perform acute and chronic risk assessments, as appropriate, to identify action and cleanup levels.
  2. Evaluate action levels for the protection of worker health and safety (H&S) in coordination with the safety officer.
  3. Identify sensitive areas and recommend response priorities in close coordination with the PSC.
  4. Coordinate with local, state and federal health agencies.
  5. Provide recommendations and summary reports as requested by the IC or the PSC.

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Human Health Risk Assessments

ENVL

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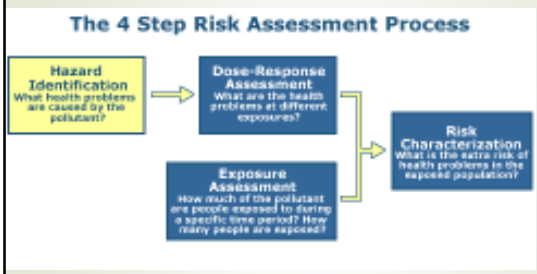
Risk Paradigm – Step 1

ENVL



Risk Paradigm – Step 2

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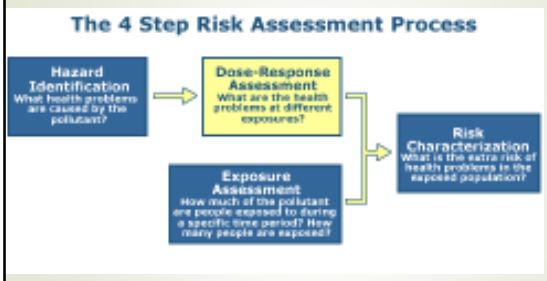

Risk Paradigm – Step 3

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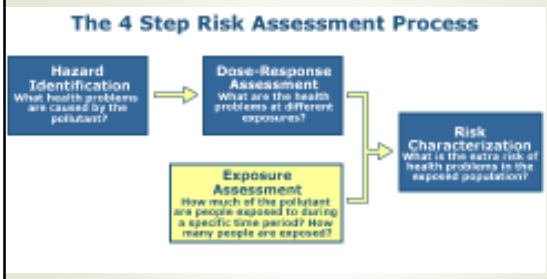

Risk Paradigm – Step 4

ENVL

Risk Management

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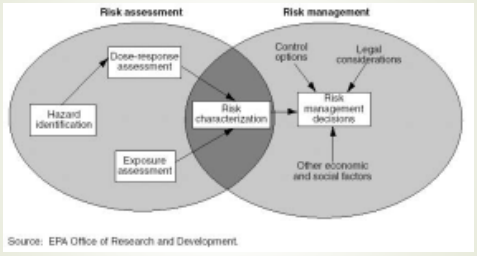

Source: EPA Office of Research and Development.

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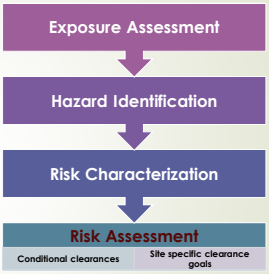
Chemical Benchmarks and Criteria

ENVL

- **Considerations**
  - **Agent dependent:** Dose response relationship, mechanism of toxicity, individual sensitivity (children, older persons)
  - **Site dependent:** What is the toxic agent? Chem, Bio, or Rad. Site characteristics (inside building, outside, etc.). Fate and transport.
  - **Exposure:** magnitude (how much), duration (how long), and frequency (how often)
- **Risk Assessment**
  - Defines the probability of a harmful effect to a population or individuals after exposure to toxic agent
  - Can NOT assess or include past exposures



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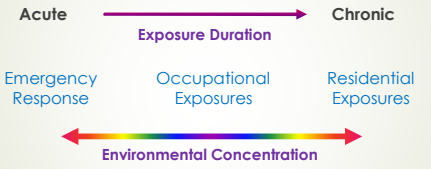
Chemical Exposure Concentration / Time Continuum

ENVL



Action Levels for Responders

ENVL

Population: Responders

- Time frame
  - Minutes (IDLH, AEGL, TEEL)
  - Hours (ERPG, AEGL, EEGL)
  - One day (EEGL, AEGL)
- Effects
  - None
  - Mild
  - Severe or Life Threatening
- Media: Air

Responder Action levels

- US EPA Acute Exposure Guideline Levels (AEGLs)
- NIOSH Immediately dangerous to life or health (IDLH)
- AIHA Emergency Response Planning Guides (ERPGs)
- US DOE's Temporary Emergency Exposure Levels (TEELs)
- NRC's Emergency Exposure Guidance Levels (EEGLs)

http://www.epa.gov/oswer/riskassessment/ragsc/pdf/appc.pdf

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Action Levels for Workers

ENVL

Population: Workers

- Time frame
  - 8 - 10 hrs per day (TWA)
  - 15 minute (STEL)
  - Instantaneous (Ceiling)
- Effects
  - None, for most workers
  - Or a specific risk level
- Media: Air

Occupational Exposure Limits

- OSHA Permissible Exposure Limits (PELs)
- NIOSH Recommended Exposure Limits (RELs)
- ACGIH Threshold Limit Values (TLVs®)
- AIHA Workplace Environmental Exposure Limits (WEELs)

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Action Levels for Residential

ENVL

Population: General Public including sensitive individuals

- Time frame
  - Lifetime (RfC, RfD, MRL)
  - 1 day, 30, 90 and 2 yrs (PALs)
  - 1-24 hrs (SPEGL)
- Effects
  - None,
  - Or a specific risk level
- Media: Contact Oral, Inhalation

2003 OSWER Directive 9285.7-53

- **Tier 1- EPA's IRIS**
- **Tier 2- EPA's Provisional Peer Reviewed Toxicity Values (PPRTVs) –** The ORD/NCEA Risk Technical Support Center (STSC)
- **Tier 3- Other Toxicity Values –** Tier 3 includes additional EPA and non-EPA sources of toxicity information.

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Indoor Screening/Clearance Goals

ENVL

- Chemicals
  - Agency method under continuous refinement and expansion
- Radiologicals
  - Based on **dose** measurement
- Biologicals
  - Based on detection of viable organisms through culture

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Protective Action Guides (PAGs) for Radiological Incidents

ENVL

Phase	Protective Action Recommendation	PAG
Early		
	Sheltering in-place of the public	1 to 5 rem
	Evacuation of the public	1 to 5 rem
	Administration of prophylactic drugs –KI 5 rem	
	Limit emergency worker exposure	5 rem or greater
	Life savings	up to 25 rem
Intermediate		
	Relocation of the public	2 rem (1st year) 500 mrem/yr
(later yrs)		
	Food Interdiction	500 mrem/yr
	Drinking water interdiction	500 mrem/yr
	Limit Worker Exposure	5 rem/yr
Late		
	Final site clean up and restoration	Site-specific optimization

http://www.remm.nlm.gov/radmonitor_water_food.htm

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Radiation Benchmarks and Criteria

ENVL

- **Risk Assessment**
  - defines the probability of a harmful effect to a population or individuals after exposure to toxic agent
- **Risk Considerations**
  - **Isotope dependent:** Likely radionuclides in an RDD include: Cs-137, Sr-90, Co-60, Am-241, Ra-226, Ir-192, Pu-238 and Pu-239/240
  - **Dose:** is a measure of the strength of a radiation field at some point.
  - **Exposure:** is a measure of the strength of a radiation field at some point.

RAGS Part A. Ch. 10 Radiation Risk Assessment Guidance

"There are special hazards associated with handling radioactive waste and EPA ***strongly recommends*** that a health physicist experienced in radiation measurement and protection be consulted prior to initiating any activities at a site suspected being contaminated with radioactive substances.

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Radiation Benchmarks and Criteria

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- There are **existing benchmarks**, in the form of requirements
  - ** Less than (10^{-4} to 10^{-6}) risk, or
  - Less than (100 or 25 or 15 or 4 mrem) dose, or
  - License / owner conditions
- There are also recommendations
  - e.g., screening levels for soil
  - Derived Intervention Levels (DILs): are specific for each radionuclide in soil or food items

** does not consider probability times consequence

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Indoor Screening/Clearance Goals

ENVL

- Chemicals
  - Agency method under continuous refinement and expansion
- Radiologicals
  - Based on **dose** measurement
- **Biologicals**
  - **Based on detection of viable organisms through culture**

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Biological Benchmarks and Criteria

ENVL

- EPA response to emergency response to Biological Agents is relatively new
- Guidance for cleanup goal determination available for Anthrax
  - EPA and CDC developed a strategy for evaluating anthrax contamination in building and outdoors. (The effort with CDC was completed a few years ago. The product is still the 2012 doc referenced below.)
    - ✓ Interim Clearance Strategy, Feb. 2012
    - ✓ "no detection of viable spores"
- With no formal guidance for other biologicals, site specific clearance goals will be developed for future incidents.
    - ✓ Recommend the development of an Environmental Clearance Committee (ECC) early in response
    - ✓ ECC can include SMEs and local public health representatives
- ECC can assist with interpretation of laboratory data for extent and clearance

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Summary of preliminary benchmarks and criteria

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- What agent (CBR) do you think is there or not there?
- What is your detection limit? You only find what you are looking for!
- What population(s) are you trying to protect?
  - Will target populations change during the event?
- How long are you trying to protect them?
- No number is a 'bright line'
- Please don't say 'safe'

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Human Health Risk Assessments

ENVL

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  1. Evaluate preliminary benchmarks and criteria , and perform acute and chronic risk assessments, as appropriate, to identify action and cleanup levels.
  2. Evaluate action levels for the protection of worker health and safety (H&S) in coordination with the safety officer.
  3. **Identify sensitive areas and recommend response priorities in close coordination with the PSC.**
  4. Coordinate with local, state and federal health agencies.
  5. Provide recommendations and summary reports as requested by the IC or the PSC.

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Sensitive Populations, Areas and Response Priorities

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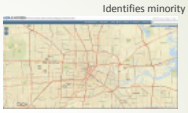
EJSCREEN (formerly EJView)

- A mapping tool that creates maps *and reports* based on geographic areas and data sets chosen
- Includes factors that may affect public and environmental health, including:
  - Demographic
  - places/landmarks
  - health
  - environmental
  - facility-level data

Identifies minority populations, old homes, etc.



https://www.epa.gov/ejscreen

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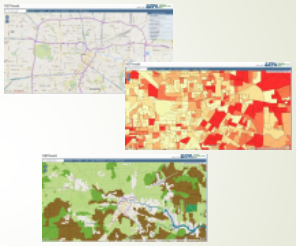
Sensitive Populations, Areas and Response Priorities

ENVL

NEPAssist

- Another mapping tool that creates maps based on geographic areas and data sets chosen
- Also Includes factors that may affect public and environmental health, including:
  - demographic
  - places/landmarks
  - health
  - environmental
  - facility-level data



https://nepassisttool.epa.gov/nepassist/nepamap.aspx

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US Census

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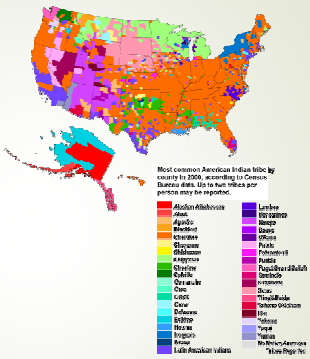
- Tribes
- Ethnic Groups
- Age
- Etc.



http://www.censusscope.org

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Historical Buildings

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National Trust for Historic Preservation
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EPA United States Environmental Protection Agency

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Human Health Risk Assessments

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- The Environmental Unit will perform short- and long-term human health risk assessments, as appropriate, to determine action and cleanup levels. Human health risk assessments activities include the following:
  1. Evaluate preliminary benchmarks and criteria , and perform acute and chronic risk assessments, as appropriate, to identify action and cleanup levels.
  2. Evaluate action levels for the protection of worker health and safety (H&S) in coordination with the safety officer.
  3. Identify sensitive areas and recommend response priorities in close coordination with the PSC.
  4. **Coordinate with local, state and federal health agencies.**
  5. Provide recommendations and summary reports as requested by the IC or the PSC.

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Under Unified Command EPA Coordinates with Local, State and Federal Agencies.

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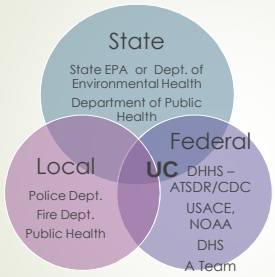

*These are just an examples. Reality could be somewhat different with more, fewer, or just totally different players.

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The Advisory Team (A Team) for Environment, Food and Health

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- The A-Team was established to assist in international and domestic nuclear emergencies.
- Provides coordinated advice and recommendations to the State, Coordinating Agency, and DHS
- Membership is comprised principally of :

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National Incident Management System (NIMS)

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- Required by HSPD5
- Provides a common structure and terminology
  - Organizational elements
  - Lines of communication
- HQ EOC
- REOC

- Different phases of a response will require different ICS units under the ENVL
  - Technical Working Group
  - Environmental Clearance committee
  - Decontamination Unit
  - Characterization Unit
  - Subject Matter Experts

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Human Health Risk Assessments

ENVL

- The Environmental Unit will perform short- and long-term human health risk assessments, as appropriate, to determine action and cleanup levels. Human health risk assessments activities include the following:
  1. Evaluate preliminary benchmarks and criteria , and perform acute and chronic risk assessments, as appropriate, to identify action and cleanup levels.
  2. Evaluate action levels for the protection of worker health and safety (H&S) in coordination with the safety officer.
  3. Identify sensitive areas and recommend response priorities in close coordination with the PSC.
  4. Coordinate with local, state and federal health agencies.
  5. **Provide recommendations and summary reports as requested by the IC or the PSC.**

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Resources for Summary Reports:

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- Risk Based Screening Levels: https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016
- Tox Profiles: http://www.atsdr.cdc.gov/toxprofiles/index.asp
- Medical Management Guidelines: http://www.atsdr.cdc.gov/mmg/index.asp
- Chemical Hazards Emergency Medical Management: http://chemm.nlm.nih.gov/
- Emergency Preparedness and Response: http://www.bt.cdc.gov/
- http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB

Wheel illustration by Janet Fong, found on https://www.aic.cuhk.edu.hk

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Information Sources

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- WISER - http://webwiser.nlm.nih.gov/getHomeData.do
- PEL/REL/IDLH - http://www.cdc.gov/niosh/npg/
- AEGLs - www.epa.gov/oppt/aegl/pubs/chemlist.htm
- PAC/TEELs - https://sp.eota.energy.gov/pac/teel/teel_pdf.html
- PALs - https://www.epa.gov/homeland-security-research (not really)
- MRLs - http://www.atsdr.cdc.gov/mrls/index.asp
- RfC/RfD - http://www.epa.gov/iris/index.html
- Ca-RELs - http://oehha.ca.gov/air/general-info/oehha-acute-8-hour-and-chronic-reference-exposure-level-rel-summary
- NRT Quick Reference Guides - https://www.nrt.org/Main/Resources.aspx?ResourceType=Hazards&ResourceSection=2

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Water and Soil Information Sources

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- Drinking Water Standards (MCLs and HAs) - http://water.epa.gov/drink/standards/hascience.cfm#dw-standards
- Water Quality Standards - https://www.epa.gov/wqs-tech
- Water Quality Standards Handbook - https://www.epa.gov/wqs-tech/water-quality-standards-handbook
- Water Quality Criteria - https://www.epa.gov/wqc
- Regional Screening Levels - https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016
- Soil Screening Guidance (SSG), including Generic Soil Screening Levels - https://www.epa.gov/superfund/superfund-soil-screening-guidance
- EPA ExpoBox (a tool for exposure assessors) - https://www.epa.gov/expobox
- Other - www.cleanuplevels.com

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Ecological Risk Assessments

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- The Environmental Unit may also perform short- and long-term ecological risk assessments (ERA), as appropriate, to determine action and cleanup levels. Ecological risk assessments activities are very similar to those for human health and include the following:
  1. Evaluate preliminary benchmarks and criteria , and perform risk assessments, as appropriate, to identify action and cleanup levels.
  2. Evaluate action levels for the protection of ecological receptors.
  3. Identify sensitive areas and recommend response priorities in close coordination with the PSC.
  4. Coordinate with local, state and federal health agencies.
  5. Provide recommendations and summary reports as requested by the IC or the PSC.

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Ecological Risk Assessment

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- Ecological Risk Assessment Guidance for Superfund (1997)
  - EPA 540-R-97-006, OSWER Directive # 9285.7-25
  - https://www.epa.gov/risk/ecological-risk-assessment-guidance-superfund-process-designing-and-conducting-ecological-risk
  - 8 step process

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ERA Paradigm – Phase 1

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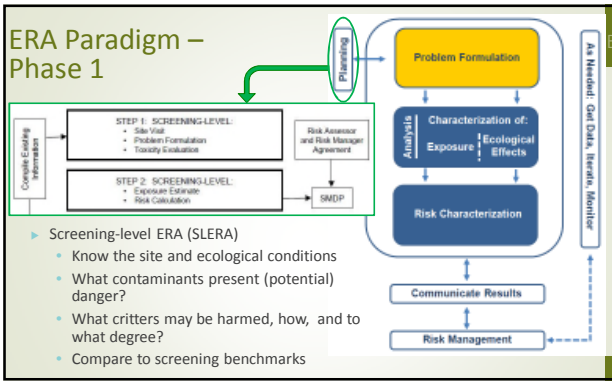

- Screening-level ERA (SLERA)
  - Know the site and ecological conditions
  - What contaminants present (potential) danger?
  - What critters may be harmed, how, and to what degree?
  - Compare to screening benchmarks

ERA Paradigm – Phase 1 (cont)

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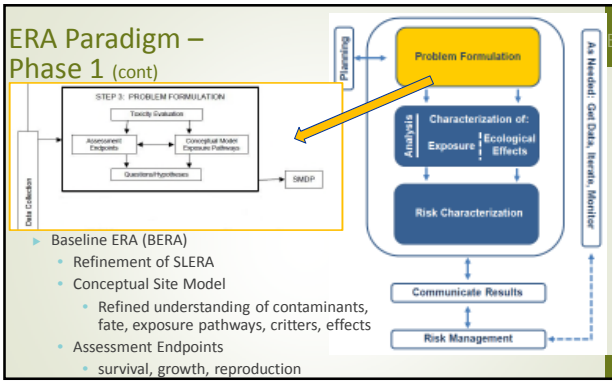
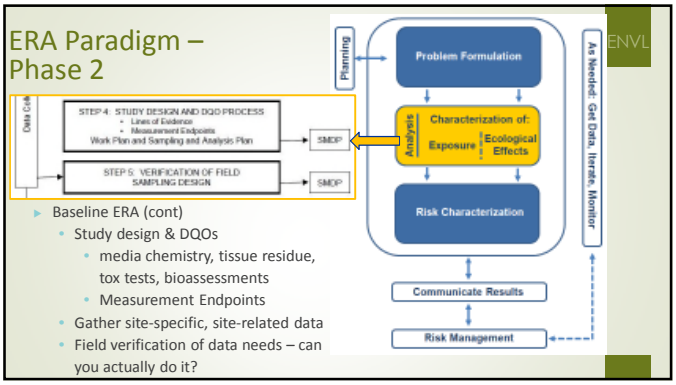


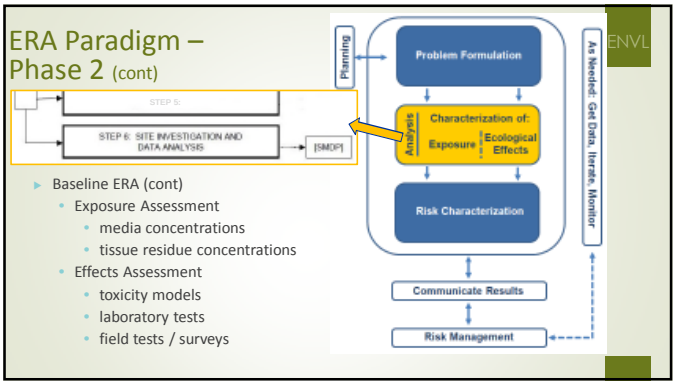
- Baseline ERA (BERA)
  - Refinement of SLERA
  - Conceptual Site Model
    - Refined understanding of contaminants, fate, exposure pathways, critters, effects
  - Assessment Endpoints
    - survival, growth, reproduction

ERA Paradigm – Phase 2



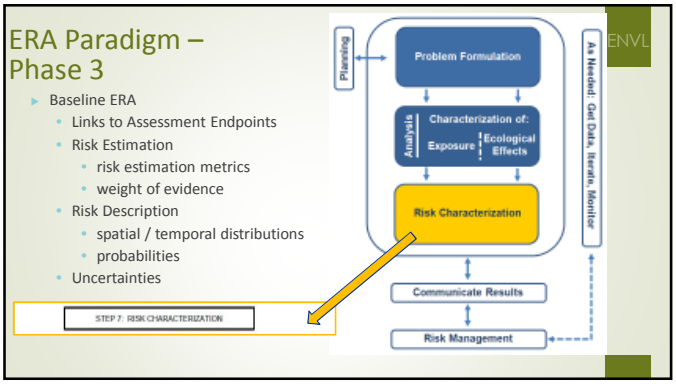
- Baseline ERA (cont)
  - Study design & DQOs
    - media chemistry, tissue residue, tox tests, bioassessments
    - Measurement Endpoints
  - Gather site-specific, site-related data
  - Field verification of data needs – can you actually do it?

ERA Paradigm – Phase 2 (cont)



- Baseline ERA (cont)
  - Exposure Assessment
    - media concentrations
    - tissue residue concentrations
  - Effects Assessment
    - toxicity models
    - laboratory tests
    - field tests / surveys

ERA Paradigm – Phase 3



- Baseline ERA
  - Links to Assessment Endpoints
  - Risk Estimation
    - risk estimation metrics
    - weight of evidence
  - Risk Description
    - spatial / temporal distributions
    - probabilities
  - Uncertainties

ERA Paradigm – Phase 3 (cont)

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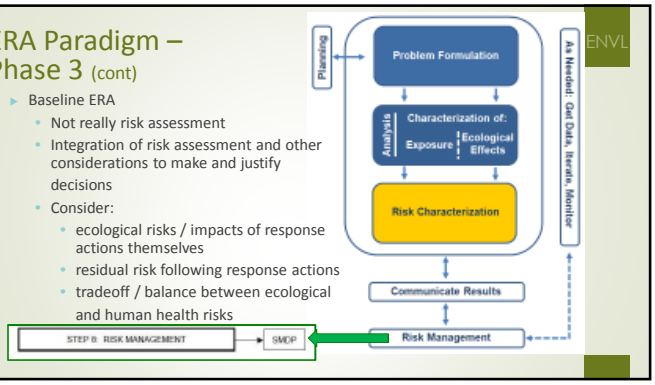
- Baseline ERA
  - Not really risk assessment
  - Integration of risk assessment and other considerations to make and justify decisions
  - Consider:
    - ecological risks / impacts of response actions themselves
    - residual risk following response actions
    - tradeoff / balance between ecological and human health risks



Toxicity Reference Values (TRVs) and Screening Benchmarks

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- EPA Ecological Soil Screening Levels (EcoSSLs) -
  - Mostly metals, PAHs, DDT, dieldrin, PCP
  - http://www.epa.gov/ecotox/ecossl
- EPA EcoTox Database -
  - http://www.epa.gov/ecotox
- Oak Ridge National Laboratory (ORNL) -
  - https://rais.ornl.gov/tools/eco_search.php
- Los Alamos National Laboratory (LANL) EcoRisk Database -
  - http://www.lanl.gov/environment/protection/eco-risk-assessment.php

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Toxicity Reference Values (TRVs) and Screening Benchmarks

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- NOAA Screening Quick Reference Tables (SQuiRTs) -
  - http://response.restoration.noaa.gov/environmental-restoration/environmental-assessment-tools/squirt-cards.html
- USGS Patuxent Wildlife Research Center -
  - http://www.pwrc.usgs.gov/contaminants
- FWS Contaminant Reports -
  - http://www.pwrc.usgs.gov/eisler/reviews.cfm
- EPA Regional Screening Levels
  - Regions 3 BTAG, Region 4 ESLs, Region 5 RCRA Screening Levels
- EPA National Recommended Water Quality Criteria -
  - https://www.epa.gov/wqc

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Toxicity Reference Values (TRVs) and Screening Benchmarks

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- Texas Commission on Environmental Quality (TCEQ) -
  - ERA Guidance: https://www.tceq.texas.gov/remediation/eco/eco.html
  - Eco Protective Concentration Levels Database: https://pcl.wtamu.edu/pcl/login.jsp
- EPA Equilibrium Partitioning Sediment Quality Benchmarks
  - metals, PAHs, non-ionic organics, dieldrin, endrin,
- Other States
  - Washington State Department of Ecology
  - Wisconsin Department of Natural Resources
- Consensus-based Sediment Quality Guidelines
  - Long & Morgan, 1990
  - Long et. al., 1995
  - MacDonald et. al., 2000

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Other Ecological Risk Resources

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- EPA ECO Updates -
  - http://www.epa.gov/oswer/riskassessment/ecoup/
- EPA ORD Ecological Risk Assessment Support Center -
  - https://cfpub.epa.gov/ncea/erasc/recordisplay.cfm?deid=154348
- Conducting Ecological Risk Assessments at Remediation Sites in Texas (TCEQ) -
  - http://www.tceq.texas.gov/remediation/eco/eco.html
- Risk Assessment Information System (DOE) -
  - http://rais.ornl.gov/
- Tri-Service Environmental Risk Assessment Workgroup (DOD) -
  - http://usaphcapps.amedd.army.mil/erawg/

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Other Ecological Risk Resources

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- California OEHHA Ecotox database and exposure factors - https://oehha.ca.gov/ecotoxicology/general-info/calecotox-database
- USGS PWRC Terrestrial Vertebrate Site (characteristics, exposure & effects database) - https://www.pwrc.usgs.gov/contaminants-online/
- US Army Corp of Engineers, Environmental Residue Effects Database - https://ered.el.erdc.dren.mil/
- Environment Canada HerpTox – http://www.on.ec.gc.ca/herptox/

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Other Ecological Risk Resources

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- EPA EcoBox
  - like the HHRA ExpoBox resource
  - due out March 31, 2017

ERA in the ENV bottom line

ENVL

- Ecological risk assessment is highly diverse
  - numerous species
  - numerous scenarios
  - an endless list of resources
- Ecological risk assessments are highly site-specific
- Make sure the ENV utilizes experienced ecological risk assessors
- Make sure the ENV consults local and state officials on ecological matters

Summary

ENVL

- The mission of EPA is to protect human health and the environment.
  - ENVL will work closely with different units under the ENV, other units of the ICS (e.g., situation unit), different agencies, HQ, and others as needed.

Questions?