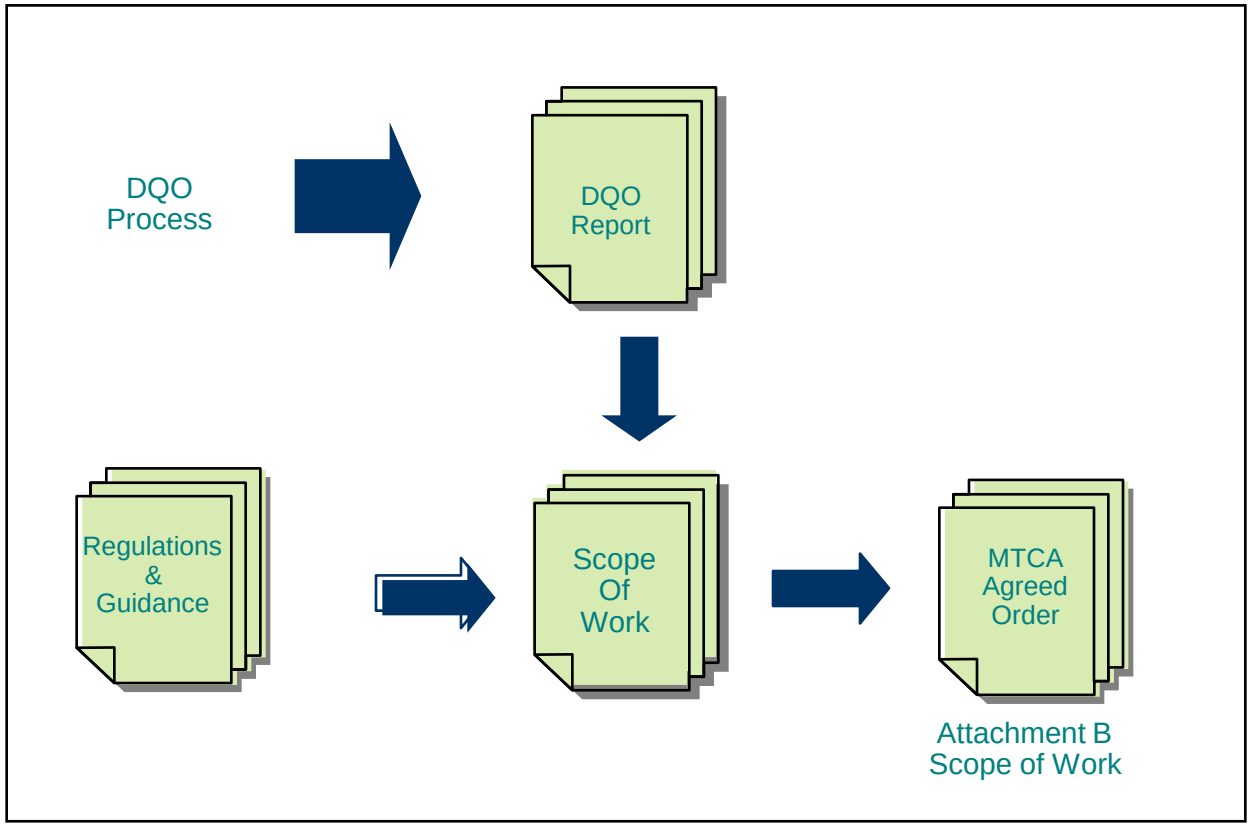
US Ecology EPA 7-Step Data Quality Objective (DQO) Process

Jerry Yokel
Department of Ecology

Why did we need a DQO?

- Meet needs for a MTCA Remedial Investigation
- Public Involvement
- Define past progress
- Define future path forward
- Defensibility

Relationship Between the MTCA Order and the DQO Process and the Scope of Work



Step 1 – Purpose

- Identify the data required to support the RI/FS process
- Only the non-radiological constituents at the site will be dealt with via the Model Toxics Control Act

Objectives

- 2003 Funds appropriated by the legislature to complete the MTCA investigation under an Agreed Order
- Consider characterization from Phase I and Phase II investigations
- 2002 Invitations were sent out to stakeholders, USE, USDOE, and other state agencies for participation
- Hire contractor (EQM) to facilitate process

Meeting Participants

Name	Present on 10/16/02	Organization
Larry Oates	x	EQM
Mitzi Miller	x	EQM
Jerry Yokel	x	Ecology
Damon Delistraty	x	Ecology
Earl Fordham	x	WDOH
Tina Masterson-Heggen	x	Ecology
Zelma Maine-Jackson	x	Ecology
Thomas Stoops	x	OR Office of Energy
Gabriel P Bohnee	x	Nez Perce ERNM
Brenda Becker-Khaleel		Ecology
Robert Haight	x	US Ecology
Jim Penor	x	COR
Harold Heacock		Tridec
Fred Jamison	x	Ecology
Tim Hill	x	Ecology
Jane Hedges	x	Ecology
Lois Dahmen		Ecology
John Brodeur		ES&E
Sandra Lilligren	x	Nez Perce Tribe
Not present, but please include in distribution:		
Nancy Darling		WDOH
Larry Goldstein		WDOH

What information was presented to DQO participants?

- SITE HISTORY 1-7
- 1.3.1 Physiography
- 1.3.2 Stratigraphy
- 1.3.3 Hydrologic Setting
- 1.3.4 Unsaturated Zone
- 1.3.5 Clastic Dikes
- 1.4 DATA FROM PREVIOUS INVESTIGATIONS
- 1.4.1 Trench area soil gas and soil data
- 1.4.2 Resin Tank Area Data
- 1.4.3 Groundwater Wells
- 1.4.4 Groundwater Data
- 1.4.5 Additional documents
- 1.5 CONCEPTUAL SITE MODEL
- 1.6 CONSTITUENTS OF POTENTIAL CONCERN
- 1.7 Problem Statement

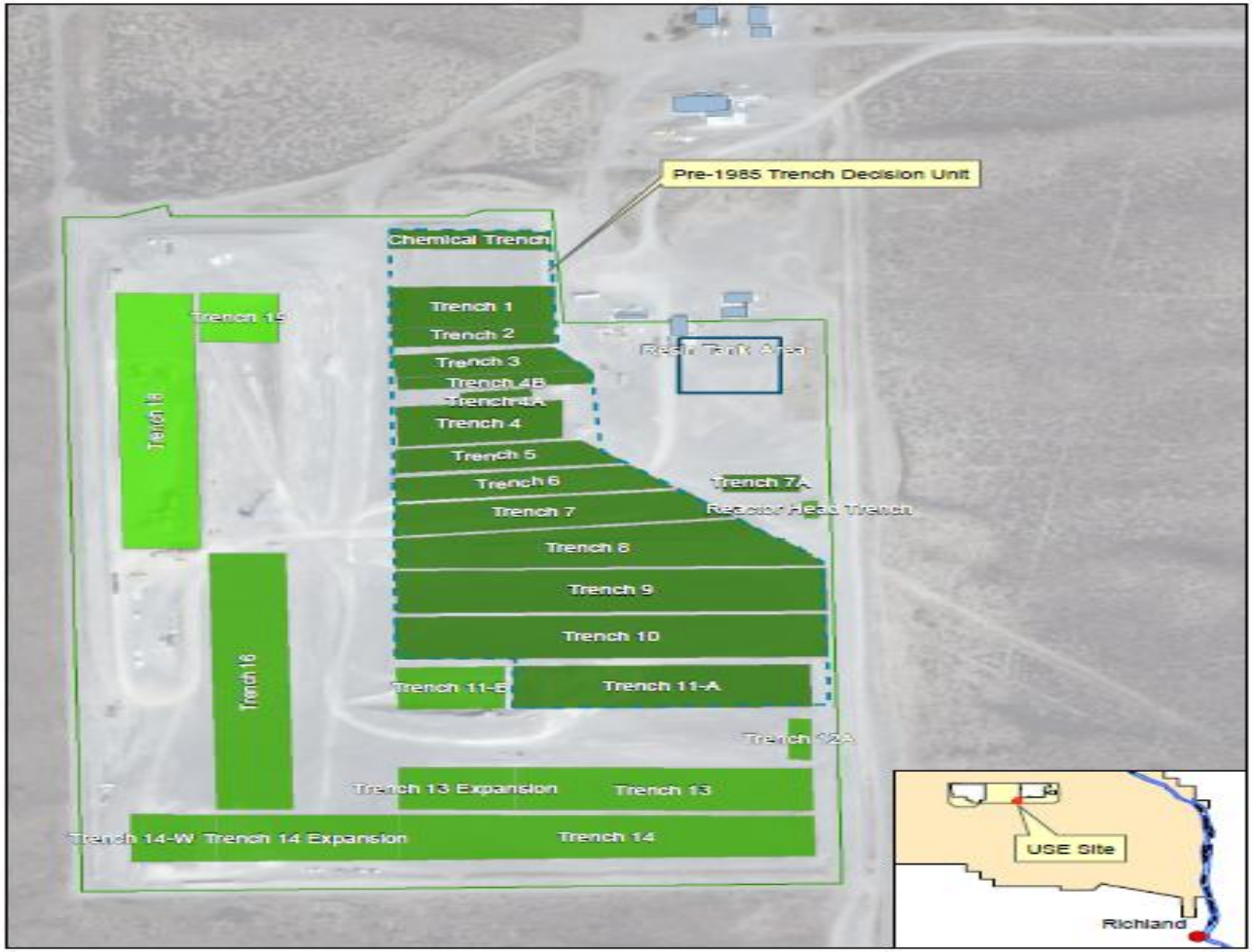
Site History

- 1965 Licensed to California Nuclear
- 1968 Nuclear Engineering Company
- 1970 17000 cubic foot Chemical Trench closed
- 1980 Cardboard packaging no longer accepted
- 1985 All RCRA mixed waste disposal stopped – end of scintillation fluids
- 1985-1986 Five resin tanks pumped
- 1986 Oils and chelators require solidification, groundwater well construction
- 1993 Packaging changed from drums to wood or metal boxes
- 1997 Draft EIS
- 1999 Absorbed liquids no longer accepted
- 1998-1999 Phase I, Phase II

What has been disposed

- Since 1965 Low-level radioactive mixed waste from hospitals, laboratories, universities, private industry, government, military, and nuclear power facilities.
- Shallow trenches - 20 filled, which include a nuclear reactor vessel, three emptied underground tanks, scintillation fluids, absorbed liquids, metal drums, fiber board drums, cardboard, wood, and metal boxes.
- Five underground storage tanks for treatment of liquid resin wastes. Resin Tanks received LLRW from laundering activities and ion exchange resins from U.S. Navy nuclear power plants.

Site Layout


Pre-1985 Trench Decision Unit
Chemical Trench
Trench 1
Trench 2
Trench 3
Trench 4B
Trench 4A
Trench 4
Trench 5
Trench 6
Trench 7A
Trench 7
Trench 8
Trench 9
Trench 10
Trench 11-B
Trench 11-A
Trench 12A
Trench 13 Expansion
Trench 13
Trench 14-W
Trench 14 Expansion
Trench 14
Trench 18
Trench 18
USE Site
Richland

Data from previous investigations

UNIT	DESCRIPTION
Trenches 1-4	Cardboard boxes, fiber board drums, and metal drums.
Chemical Trench	Absorbed liquids, phenol, chemical waste drums, phenolic resin, toluene, benzene, xylene, lead, berylium
Trenches 6-10	Scintillation Fluids
Trench 5	Containerized absorbed liquids, scintillation fluids
Trench 7A	Unknown
Trenches 4A & 4B	Hot radiation sources
Resin Tanks	Laundering and ion exchange resins from Navy nuclear power plants
Groundwater Wells	1986 Four downgradient and one upgradient constructed. 1996 Two upgradient

Step 2 –Identify Decisions

- **Table 2-1. Principal Study Questions, Alternative Actions, and Decision Statements. (3 sheets)**

- **Preliminary Study Question**
- Do LLRW Site soils contain non-radiological contaminants at concentrations that would result in exceedence of human health risk thresholds?

- **Alternative Action**
- a
- Yes, Remediate
-
-
- b
- No, no further action, continue to other decisions
-

Step 3 –Inputs

- COPC's selected from Phase I and II
- Samples collected during remedial investigation be analyzed by EPA SW-846 method analysis for the detection of any contaminant. Full suite for method based target analyte approach.
- Statistical Assessment
- Risk Evaluation – MTCA B, look at scenarios
- Soil physical parameters

Step 4 –Define the Boundaries

- Resin Tank Area
- Pre 1985 inclusive – 1, 2, 3, 4, 4A, 4B, 5, 6, 7, 7A, 8, 9, 10, 11A, Chemical Trench
- Post 1985 – 11B, 12, 13, 14, 14A, 16, 18, RXT Trench
- Groundwater

Step 5 – Develop A Decision Rule

–13 were developed

- PSQ#2 Does groundwater contain non-radioactive contaminants at concentrations that would result in exceedence of human health risk thresholds?
- DR#2 If groundwater at the down gradient site boundary contains non-radioactive contaminant listed in Table 3-7, at concentrations that exceed MTCA method B cleanup levels then groundwater remediation will be required consistent with the remedy selection as established in WAC 173-340-350 through 390

Step 6 – Specify Tolerable limits on Decision Errors

Three separate sampling strategies must be developed for:

- the resin tank area,
- the pre 1985 and inclusive trench areas,
- the post 1985 trench areas, and
- groundwater.

Step 7– Optimize Sample Design

- Criteria for final optimized design recommended documentation to follow
- Analytical approach, sample prioritization, data validation
- Physical Properties

Agreements for the Sampling Design

- Sample from three zones: pre-1985 trenches, resin tank, groundwater
- No sampling through the trenches because of the risk to workers
- High priority to sample the resin tank area due to past flooding
- Determination for additional groundwater wells not made until RI/FS complete