

MEETING MINUTES
OU 1 PUBLIC HEALTH EVALUATION, CONTAMINANTS OF CONCERN
JULY 6, 1993

MEETING ATTENDEES:

Cindy Gee, Dennis Smith, Rick Roberts, Jeff Bray(EG&G)
Mike Anderson(Weston)
Beverly Ramsey(SMS/DOE)
Joe Gordon, Fred Duncan(Dames & Moore)
Gary Kleeman, Bonnie Lavelle(EPA)
Richard DeGrandchamp(PRC)
Jeff Swanson, Diane Niedzwiecki(CDH)

1. Introduction(Cindy Gee)- Just received EPA/CDH comments on COC's screened from site contaminants identified by UTL/background comparison/ANOVA process.

2. Review of COC Screening Flow Chart(Dennis Smith)- Human health risk assessment(HHRA)/ environmental evaluation(EE) will be performed on actual contamination from nature and extent determination. Nature and extent evaluation is initially performed on all data using UTL, ANOVA, and professional judgement (flow chart attached)

Comments:

(Gary)- More professional judgement used than anticipated. Background UTL didn't screen much.

Discussion of Criteria:

3. Bonnie stated that EPA agreed with criteria #1,2,8(see attached. Criteria for Determining an Element or Compound is Not a Contaminant). Bonnie believed attached criteria for determination included added criteria that was not agreed upon previously.

(Dennis)-Method has been out for several months and is consistent with guidance. No reason for change.

(Diane)-CDH does not agree with criteria #7,9,10,11.

4 Beverly stated that EPA/CDH are going beyond identification of source by wanting analyzation of all analytes for the HHRA, not waste related analytes only. Mike explained that it does not make sense to include every analyte, a problem is statistical comparison to background doesn't always screen out analytes not of concern

5. Cindy clarified that no criteria was applied singly.

6. (Diane) CDH is concerned with criteria #10. If there are inconsistencies with groundwater background comparisons, further investigation is needed.

Joe explains criteria #10 is used when total results are less than filtered results.

7. Beverly confirms group agreement with criteria #1,2,8

8. (Diane) CDH does not agree with criteria #9 due to the chance for natural variation. In reference to criteria #11, should look at doses if ANOVA is invalid.

9. Cindy and Dennis state that there is no need for Remedial Investigation(RI) if HHRA and EE use all lab data. It is against National Contingency Plan to let HHRA determine COC's and give to RI.

Results of COC Screening(Joe)

10. Joe explained the results of contaminant screening displayed in the handout distributed at the meeting. Direct contamination was considered as ingestion/inhalation for surface soils and ingestion for groundwater. Joe used RAGS, part B standards in completion of screening contaminants Dennis stated that inhalation standards are not conservative under B regulations; DOE uses a standard of 37 micro-g/m³ high volume samplers.

(Bonnie)-RBC's need to be based on multiple pathways. Dermal contact pathway must also be assessed There is a difference in interpretation of NCP. Is there an assessment for all risk or only waste related risk? e.g. Arsenic

11. Joe's goals of the meeting were to know what methods to do next and to have sensible data which will make sense to the public.

Discussion of COC's:

12. Cindy asked for rationale on why agencies don't agree with criteria #3 and #4 when the spatial/temporal box has long been present in the flowchart diagram.

Answer(Bonnie) Thought #3,4 would include contaminants rather than exclude them. Bonnie requested that OU be changed to Rocky Flats Plant

in criteria #3.

Mike stated that criteria #4 was only used with chromium while #3 was used in connection with total/filtered results.

It was agreed that total (rather than filtered) will be used to assess contamination, as is done in the human health risk assessment.

13. Cindy confirmed with the group that criteria #1,2,3,4,8 is allowable. Gary stated that #3 would be allowed if argument is strong and clear.

14. Beverly defined outliers and Richard questioned if they were further pursued in anomalies screen.

15. Cindy stated that we should presently be at the EPA/CDH results stage, but instead we are at the previous step: methodology. (referring to COC screening flowchart) Will need an extra 2-3 weeks to rework RI and contaminant screen.

16. Bonnie questioned why the list of seventeen contaminants can't be included in nature and extent/screening process. Joe proposed that the group discuss the including or excluding of the seventeen contaminants. Richard believed that deciding on the seventeen contaminants now would not follow a method which would be defensible to the public.

17. Cindy proposes running the screen with criteria #1,2,3,4,8 and if list is different then EPA and CDH will review it.

18. Diane questions how #3 and #6 are different.

Answer: #3 represents pattern and is not across all media.

Gary Kleeman asks criteria #3 to read: Spatial distribution of concentrations within a medium is not indicative of contamination of OU waste origin.

19. Contaminants classified as essential nutrients were discussed. eg. Na, Ca, K

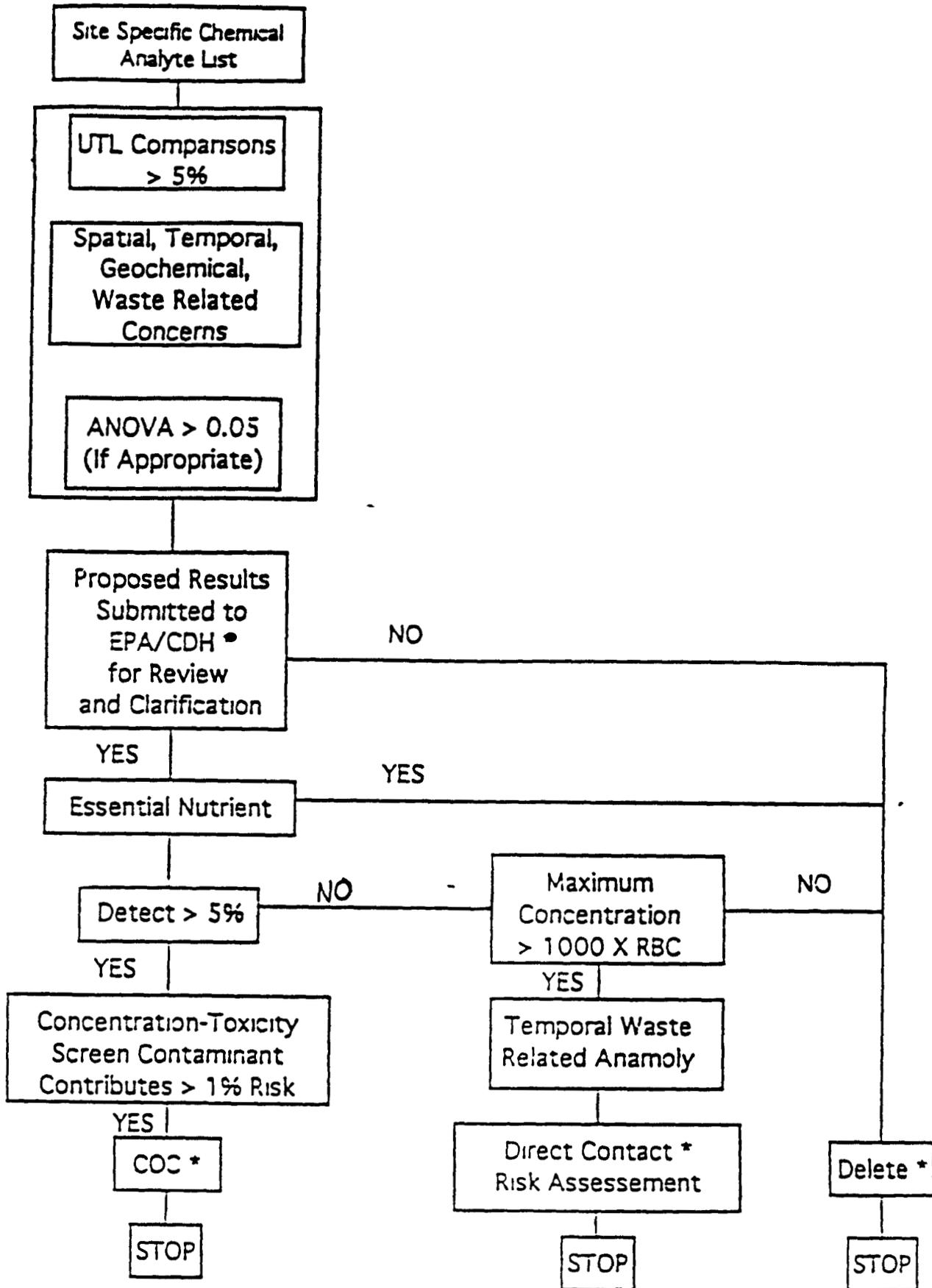
20. Bonnie stated that these meetings are for informational purposes for RI and cannot be used as official comment, or as a reason for schedule extension.

21. Final decision was to revise list of COC's using criteria #1,2,3,4,8

and then submit for agency comment. DOE will present a fuller argument by 7/12/93. The ER COC meeting will be held as planned and Dennis proposes a discussion of the seventeen contaminants after the meeting with Dr. Gilbert.

OU-1 RI REPORT COC SCREENING FLOW CHART
8-APRIL-1993

* Professional judgement may be used to retain or delete a chemical.



CRITERIA FOR DETERMINING AN
ELEMENT OR COMPOUND IS NOT A CONTAMINANT

- 1 A Frequency of background UTL (or max value, whichever is reported) exceedance is less than or equal to 5%, and data do not indicate a "hot spot" exists.
- 2 A For those analytes exceeding the background UTL (or max), ANOVA applied OU wide and by background subpopulations do not indicate a significant difference exists between the means of the OU and background populations for an analyte.
- 3 Dis Spatial distribution of concentrations ^{within a media} is not indicative of contamination of OU waste origin.
- 4 Dis Temporal distribution of concentrations at a station indicates the "high" value(s) is(are) outlier(s), and is the reason for failing criteria 1 or 2.
- 5 Other analytes are not determined to be contaminants in the sample or at the station.
- 6 It is not an identified contaminant in any other medium, particularly an upgradient medium or host medium.
- 7 It is not an expected contaminant i.e., it is not Be, H3, Pu, Am, U, chlorinated solvent or biodegradation product, or PCB.
- 8 A Laboratory and field blank data together with spatial and temporal distributions of concentrations suggest the results are laboratory or sampling artifact.
- 9 The site analyte concentrations are within the regional background range.
- 10 Significant differences with respect to background for groundwater are not consistent for total and filtered results.
- 11 Low percentage of detections potentially invalidating ANOVA results because of non-detection replacements

Notes:

- (1) Criteria 1 and 2 are primary criteria wherein, if the data for an analyte satisfy either criterion, the analyte is not considered a contaminant and no further data review is required.
- (2) A combination of criteria 3 through 9 are used to determine if an analyte is a contaminant when the data do not pass criteria 1 or 2.

at Damos: Moore 1pm

50 SHEETS
100 SHEETS
200 SHEETS
22-141
22-142
22-144

name representing phone

X	Cindy Gee	EGIG	966-8550
X	Dennis Smith	EG & G	966-8636
X	Rich Roberts	EG & G	966-8636
X	Mike Anderson	Westox	980-6960
X	Beverly Ramsey	SMC / DOE (Trudy)	301-353-0072 303-966-2203
X	Jeffrey Bray	EGIG	966-8695
X	Joe Gordon	Damos + Moore	299-7996
X	Fred Duncan	Damos + Moore	299-7835
X	Gary Kleeman	EPA	294-1071
X	BONNIE LAVELLE	EPA	294-1067
11.	Richard D'Avandchamp	PRC	295-1101
X	JEFF SWANSON	CDH	692-3416
X	Diane Niedzwiecki	CDH	692-2651

**MEETING MINUTES
ESTIMATING BACKGROUND AT ROCKY FLATS PLANT
SPEAKER: RICHARD GILBERT
HELD JUNE 7, 1993**

Meeting Attendees:

Rick Roberts(EG&G)	Diane Niedzwiecki(CDH)
Beverly Ramsey(SMS)	Mary A. Siders(EG&G)
Richard DeGrandchamp(PRC)	Fred A. Harrington(EG&G)
Bonnie Lavelle(EPA)	Dennis Smith(EG&G)
Amy E. Johnson(CDH)	Jeffrey Bray(EG&G)
Ralph Lindberg(EG&G)	Jeb Love(CDH)
Denny Weier(EG&G)	Tim O'Rourke(EG&G)
Jen Pepe(DOE/ERD)	Gary Kleeman(EPA)
Mike Garsuchi(EPA)	Cindy Gee(EG&G)
Joe Schieffelin(CDH)	Jeff Swanson(CDH)
Terry Jack(IMAC), Facilitator	Bruce Thatcher(DOE)

1. Expectations

- An agreement in methodology for comparison of background concentrations for Remedial Investigations on Operable Units
- A meeting which considers technical issues, not political
- A need to be pragmatic in approach to achieve efficiency
- An agreement on what is background at Rocky Flats Plant
- Receive opinion on sensitivity decisions to definition of background
- Communication between agencies concerning methods

2. DOE/EG&G APPROACH

(Dennis Smith)

Information collected during Remedial Investigations is used for Human Health Risk Assessment, Environmental Evaluation Risk Assessment, Nature and Extent, Modelers, and Regulatory Compliance Analysis. The tools for these information users include UTL comparisons; Spatial, Temporal, and Gradient distributions; and ANOVA measurements. These tools are used in comparison of Contaminants of Concern(COC) to background concentrations.

3 EPA POSITION

(Bonnie Lavelle)

Objective is to have a background comparison method which minimizes professional judgement. Elimination of contaminants should occur when levels are below background, not by use of professional judgement. EPA feels that UTL and 5% rule do not represent the samples entirely. Gilbert agrees that 5% rule should not be used for removing data.

4. CDH POSITION

(Jeff Swanson)

CDH does not have a position on the appropriate method for background comparison. An effective method would be one which produces a defensible document for the public and one which involves communication between agencies.

5. Ralph Lindberg explained the location and sampling techniques used at Rock Creek.

Question:

Is Rock Creek good for background comparison?

Answer:(Ralph)

There is a possibility that airborne particles reach surficial soils in the Rock Creek area. (Radionuclides) Questions exist concerning possible contamination from upgradient railroad tracks.

6. Richard Gilbert explained concepts used in defining background

(see copies of overhead projections)

-Two Concepts of "Background"

-Approach to Comparisons

-Criteria for Selecting A Test

-Issues in Comparing Site to Background

-Parametric and Nonparametric testing

-Tolerance Interval Approach

-Density Distribution comparing Background to Cleanup areas

7 Discussion of background characterization completed at Westinghouse-Hanford (see copies of overhead projections)

8. Richard Gilbert explained concepts used in comparison to background

100A23

Question(Dennis)

What procedures do you follow when running separate analyses of common data and receiving different answers(P Values)?

Answer(Richard Gilbert)

- Examine data to determine context
- Using judgement, determine best test
- May be a need for more data

(Gilbert) UTL is an indicator, should not be used to make decisions.

9. Recommendations in Statistical Discussion and Process

1. Develop rationale for each "test" in tool box
2. Do multiple "tests" in above context
3. Use tests with minimum assumptions unless you can validate assumptions
4. Use UTL as a screening tool indicator, never as a definitive test
5. Include graphical and descriptive methods in tool box
6. Develop better understanding of performance of tools in tool box
7. Reach consensus on the site distributors important to detect
8. Use DQO process in future
9. Institutionalize "team approach" to planning
10. Don't forget Phase III (Geologic Knowledge)

(Gilbert) If all concentrations are under UTL(dependent upon number of samples) then there is no contamination problem

- spatial, temporal, and seasonal conditions may act as exceptions

10. Mary Siders explains Selection of Statistical Method for Comparison of Background and Nonbackground Populations flowchart

- used as a screen, not as a definitive test

11. Gilbert recommends use of Helsel method for non-detect samples

12. Statistics Flowchart(1), Geosciences Flowchart(2), and Gilbert Approach(3) were discussed as method options for background comparison

13 Beverly Ramsey proposed Richard Gilbert, as a contractor of DOE, to develop a methodology for background comparison which can be used for future Operable Units(OU).

Comments on Proposal:

EPA(Lavelle)

A May 20, 1993 stated EPA favored a third party opinion. Gilbert completing the proposed methodology will follow their concerns in the letter.

CDH(Swanson)

Agrees the use of Gilbert will be beneficial

DOE(Thatcher)

In favor of having third party arbitrator

Items Made Deliverable to Richard Gilbert:

OU 7 data from Tim O'Rourke

OU 1 data from Gary Kleeman

Background data from Mary Siders

Field Sampling and Analysis Plan from workplans of OU 1 and OU 7

* Most data will be given to Gilbert by end of day on 7/8/93 in a statistically and graphically useable manner("cleaned up" data)

Gilbert is to complete a detailed recommendation for background comparison and a general flowchart for future by July 31.

naturally occurring Uranium It was therefore removed from further consideration in the first screening process(UTL/background screen). Uranium in groundwater was not eliminated.

Question(Bonnie Lavelle):

This list of COC's differs from the previous list?

Answer(Mike/Cindy)

Yes-the list of COC's is different The reason is that the use of ANOVA caused the test to only look at the contaminants above background.

Question(Beverly):

Does Toluene imply a risk which shouldn't be there?

Answer(Cindy):

We cannot dismiss Toluene at this point. Levels varied greatly; some samples occurred ten times over background.

Comments:

-Nothing in Standard Operating Procedures to explain high levels as lab/sampling artifact.

-Coherex as a dust suppressant may cause increased levels but it cannot be definitized as the source.

3 It was agreed on by the group that the first list of COC's will be disregarded.

4 The list of invertebrates included in assessment of hotspots is listed in earlier minutes.

5 Biomagnification was described as increasing concentration levels through different trophic levels.

Analysis of biomagnification will be completed with coyotes. Effects are expected to be negligible.(Mark)

6 Bonnie requested that Cindy forwards data, when completed, of OU wide risk estimation(#5) and Identification of hot spots within OU using polygon method(#8). (see attached flowchart Process for Identification of Contaminants of Concern, Environmental Evaluation)

7 Bonnie wants to find agreement on screening procedures Cindy explained that the eleven criteria defined the UTL, Spatial, Temporal, Geochemical Criteria; and ANOVA measurements Nothing was added Gary

Attendees

<u>Name</u>	<u>Organization</u>	<u>Phone</u>	<u>Fax</u>
Beverly Ramsey	SMS	301-353-0072 966-8203	301-353-0076
Bruce Thatcher	DOE RFO	303-966-3532	966-4871
Richard Delaudchamp	PRC	303-225-1101	303-256-1207
Donnie Lavelle	EPA	303-294-1067	303-294-7557
Johnnie Love	CDH	303 692-2636	303 782-018
Jane Niedzwiecki	CDH	303-692-2651	303-782-018
Jack Roberts	EG&G	(303) 966-8508	(303) 966-8556
Mary A. Siders	EG&G	303 966-6933	303 966-8556
Fred A. Huntington	EG&G	303 966-8744	(303) 966-8663
Dorris Smith	EG&G	966-8636	
Teffy Bay	EG&G	966-8695	
Pepp Lindberg	EG&G	966-8582	
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Benny Weiler	EG&G	303-966-4194	303-966-2263
Tim Orourke	EG&G	303 966-8577	303 966-8556
Jen Pepe	DOE/ERD	966-2184	966-4871
Jary Kleeman	EPA	294-1071	294-7559
Mike Harschi	EPA	303-293-1510	293-1724
Lindy Gell	EG&G	966-8550	966-8556
Joe Schreffelin	CDH	692-3356	759-5355
JEFF Swanson	EPH	692-346	759-5355

MEETING MINUTES
OU 1 ECOLOGICAL RISK ASSESSMENT, CONTAMINANTS OF CONCERN
JULY 8, 1993

Meeting Attendees:

Paul Singh(RFO/ORNL)

Beverly Ramsey(SMS)

Cindy Gee, Jeff Bray, Terri Knudsen, Dennis Smith, Fred Harrington(EG&G)

Mark Lewis, Kelley Crute, Allen Crocket(Stoller)

Jeff Swanson(CDH)

Gary Kleeman, Bonnie Lavelle(EPA)

Joe Gordon(Dames & Moore)

1. Introduction(Cindy Gee)- DOE/EG&G is completing the Toxicity Screen of the RI Report Contaminants of Concern(COC) Screening Flow Chart. Cindy requested comments from agencies concerning the inclusion or exclusion of COC's for the ecological risk assessment.

2. Methods/Results of COC Screening(Mark Lewis)- Described COC screening process completed by Stoller and Weston. The three criteria used in identifying COC's includes occurrence, extent, and ecotoxicity. In the contaminant screening process, Weston completed the occurrence and extent criteria while Stoller completed the ecotoxicity phase using the site contaminants resulting from the of UTL/background comparison/ANOVA screening.

Mark Lewis described the tables listing the occurrence and concentrations of potential contaminants. The eight final COC's of the environmental evaluation were also explained.

Question(Beverly Ramsey):

Why toluene is in high concentrations in OU 1 subsurface soils?

Answer(Mike):

Forty percent of background samples also contained toluene. Could also be present in QA samples, indicating laboratory problems

Question(Gary Kleeman)

What is risk of Uranium in surface soil?

Answer(Cindy):

Phase II radioisotope work delineated the Uranium present as

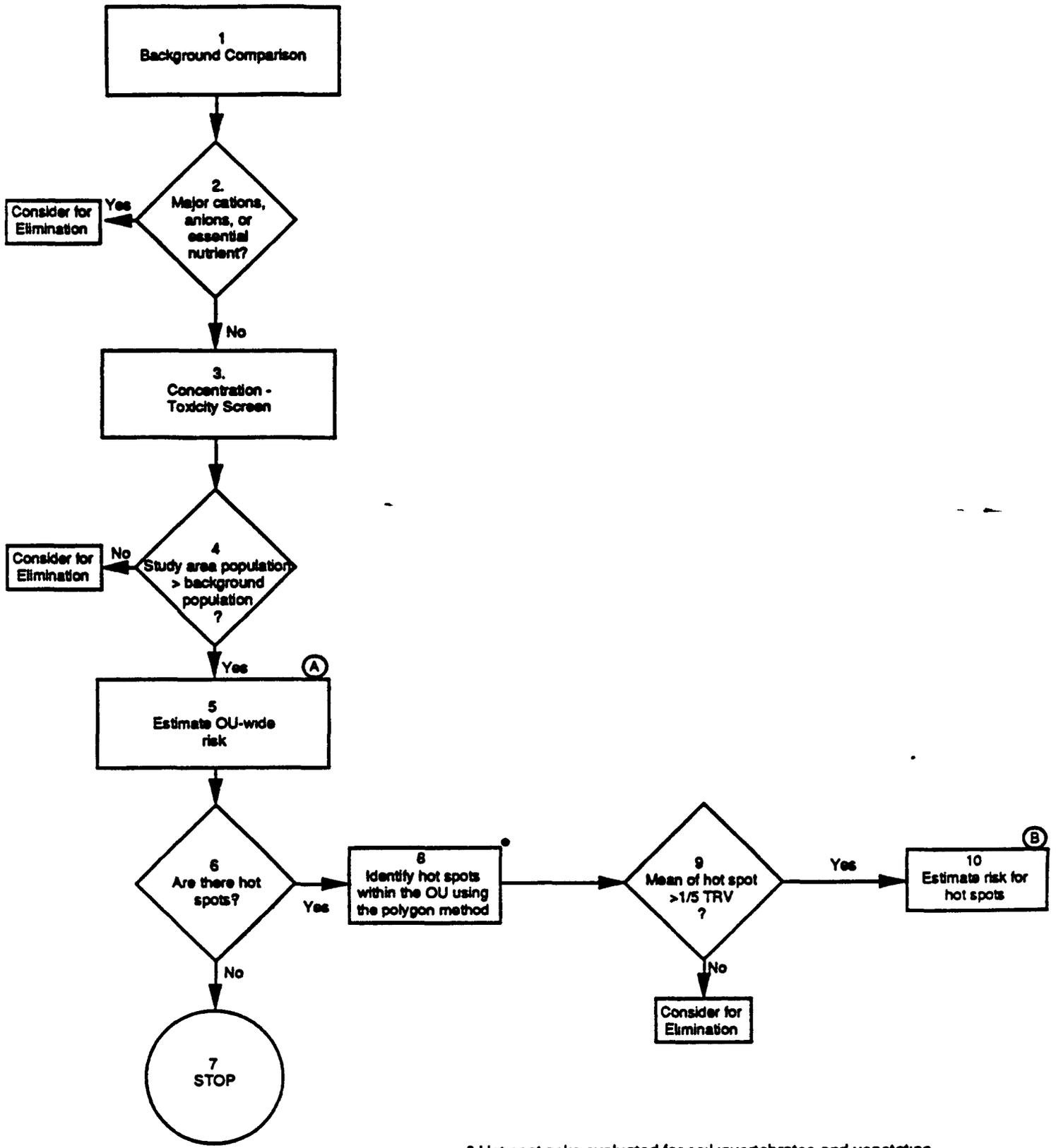
Kleeman mentioned UTL/Spatial/ANOVA box should be used only for Nature and Extent. The list of contaminants from this list should not be forwarded to the risk assessors.

8. Beverly discussed details in EPA work sheet: Selection Process for COC's.

9. Two options were discussed in the COC list decision. Cindy can go forward with work and contend with possibility of dispute or a meeting can be planned to discuss specific concerns of individual contaminants and criteria.

10. A meeting has been planned for Tuesday at 1:00 for DOE, CDH, and EPA to discuss specific concerns in the contaminants selected through the UTL/ background screening process. Cindy Gee will fax the site contaminant list(using of Criteria #1,2,3,4,8) on Monday to DOE, EPA, and CDH. The subsequent meeting will involve only nature and extent contamination concerns and not try to second guess the risk assessors.

Figure 1. Process for Identification of Contaminants of Concern: Environmental Evaluation



* Hot-spot risks evaluated for soil invertebrates and vegetation

**CRITERIA FOR IDENTIFICATION OF CONTAMINANTS OF CONCERN:
OU 1 ENVIRONMENTAL EVALUATION**

1. Occurrence

The chemical must have been detected in samples from abiotic media and expected to occur in the waste stream or accidentally released. Judgement was made quantitatively or qualitatively based on Phase I, II, and III RFI/RI data.

This step was accomplished by Weston in the contaminant screening process.

2. Extent

To be named a COC, radionuclides and metals must have occurred at concentrations above the natural background for Rocky Flats. In general, a radionuclide or metal could be included if it occurred at concentrations exceeding background in more than five percent of the samples from a given medium. Organic chemicals were considered if they were detected in greater than five percent of the samples. However, a chemical could also be included if data indicated hot spots or anomalously high concentrations in a small number of samples.

This process resulted in a list of chemicals to be considered for inclusion in the COCs. This step was also accomplished by Weston in the contaminant screening process.

3. Ecotoxicity

This step is equivalent to the "concentration-toxicity" screen of the human health risk assessment. Chemicals that were considered "contaminants" as a result of the screen conducted by Weston were evaluated for potential ecotoxicity of concentration detected at OU 1. Maximum concentrations for a given medium were compared to benchmark toxicity values derived from scientific literature. If the maximum concentration exceeded the reference value, the chemical was included in the COCs. A chemical for which concentrations did not exceed the reference value may have been retained if it occurred in several media (ie., toluene) or if it were known to biomagnify and could result in high exposure to upper level consumers. Biomagnification was considered an important pathways if bioconcentration factors greater than 100 are known for a particular contaminant.

This step was completed by Stoller using results of the contaminant screening conducted by Weston.

Table 1. Potential contaminants at OU 1

Analyte	Medium					
	Surface Soils	Subsurface Soils	Ground-water	Surface Water	Seeps	Sediments
<i>Metals</i>						
calcium (EN)	x	x	x	x		x
magnesium (EN)			x	x		
manganese		x	x	x		
sodium (EN)			x			x
potassium (EN)			x			
lithium		x	x			
strontium			x			
selenium			x			
vanadium			x			
<i>Radionuclides</i>						
Pu	x					
Am	x					
<i>Volatile Organic Compounds</i>						
1,1,1-trichloroethane	na		x	x		x
trichloroethene	na	x	x	x	x	
tetrachloroethene	na	x	x	x	x	
carbon tetrachloride	na		x			
chloroform	na		x			
1,1-dichloroethene	na		x			
1,2-dichloroethene	na		x	x		
cis 1,2-dichloroethene	na		x			
1,1,2-trichloroethane	na		x			
1,1-dichloroethane	na		x	x		
1,2-dichloroethane	na		x	x		
toluene	na	x	x	x	x	x
xylene (total)	na		x			

EN - essential nutrient

na - not analyzed

Table 2. Occurrence of potential contaminants in OU1 environmental media

Analyte	Medium				
	Surface Soils	Subsurface Soils	Ground-water	Surface Water	Sediments
Metals*					
manganese		6	9 (col)	<1	
lithium		6	44 (col)		
strontium			100		
selenium			36 (col)		
vanadium			44 (col)		
Radionuclides*					
Pu	88				
Am	82				
Volatile Organic Compounds**					
1,1,1-trichloroethane			14	1	9
1,1,2-trichloroethane			3		
trichloroethene		2	34	3	
tetrachloroethene		2	28	2	
carbon tetrachloride			16		
chloroform			19		
1,1-dichloroethene			13		
1,2-dichloroethene			4	1	
cis 1,2-dichloroethene			5		
1,1-dichloroethane			5	1	
1,2-dichloroethane			2	2	
toluene		97	10	3	15
xylene (total)			3		

* values are percent of samples with concentrations above background

** values are percent of samples containing detectable levels

Table 3. Maximum concentrations, preliminary TRVs, and bioconcentration factors for OU 1 contaminants

Analyte	Max surface water conc.	Aquatic TRV	Max soil conc.	Terrestrial TRV	BCF
<i>Metals</i>					
manganese	621 ug/l	1,000 ug/l	1873 mg/kg	??	
lithium	--		--		
strontium	--		--		
selenium	--	237	--		
vanadium	--		--		
<i>Radionuclides</i>					
Plutonium-239,240	--		12.99 pCi/kg		
Americium-241	--		1.94		
<i>Volatile Organic Compounds</i>					
1,1,1-trichloroethane	4 ug/l	4,500 ug/l	--		65 (10)
1,1,2-trichloroethane	--		--		
trichloroethene	8	3,130	140	200 mg/kg/da	52 (11)
tetrachloroethene	2	840	47	10	41 (8)
carbon tetrachloride	--		--		
chloroform	--		--		
1,1-dichloroethene	--		--		
1,2-dichloroethene	2	666	--		
cis 1,2-dichloroethene	3	666	--		
1,1-dichloroethane	3	??	--		
1,2-dichloroethane	14	??	--		
toluene	5	1,750	2,000	111	49 (11)
xylene (total)	--		--		

Table 4. Environmental Evaluation contaminants of concern

Analyte	Aquatic species	Terrestrial plants	Terrestrial herbivores	Terrestrial carnivores	Biomagnification
manganese	x		x		
selenium			x	x	x
Plutonium-239,240		x	x	x	
Americium-241		x	x	x	
trichloroethene			x	x	
tetrachloroethene			x	x	
1,1-dichloroethene			x	x	
toluene	x	x	x	x	

- 1 Aquatic species will be evaluated for direct exposure to contaminants in surface water
2. Plants will be evaluated for direct exposure to contaminants in soils and shallow groundwater
3. Terrestrial herbivores will be evaluated for ingestion of vegetation, surface water, and soil (where data are available to evaluate soil ingestion)
- 4 Terrestrial carnivores will be evaluated for ingestion of prey and surface water
5. The potential for increased exposure via biomagnification will be evaluated for selenium as it was detected in groundwater and could accumulate in plant species.

June 8, 1993

EG+G

ERA mtg

Attendees

	Name	Company	Phone #	Fax #
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4.	Kelley Crute	Stoller	449-7220	443-1408
5.	Allen Crockett	Stoller	449-7220	443-1408
6.	JEFF SWANSON	CDH	692-3416	759-5355
7.	Jeff Bray	EG+G	966-8695	8556
8.	BEVERLY RANSEY	SALS	301-353-0072 966-2203	301-353 0076
9.	TARA KNUDSEN	EG&G	966-8579	966-8525
10.	Joe Gordon -	Davis-More	299-7996	299-7901
11.	Dennis Smith	EG&G	966-8636	8556
12.	Fred Harrington	EG+G	966-8744	8663
13.	Gary Kleeman	EPA	294-1071	7559
14.	BONNIE LAVELLE	EPA	294-1067	7559
15.				
16.				