Phase II Property Assessment Under the VAP

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Phase II Property Assessment

- Primary Rule citation for the following discussion is 3745-300-07 of the Ohio Revised Code (ORC)

2

VAP Phase II, a combination from other Phase II styles

- CERCLA (Comprehensive Environmental Response Compensation and Liability Act)
- RCRA (Resource Conservation and Recovery Act)
- UST (Leaking Underground Storage Tank Programs)
- ASTM (formerly -American Society for Testing and Materials)

3

In addition to the VAP Rules the Ohio EPA web page contains guidance

- http://www.epa.state.oh.us/portals/30/vap/tgc/TGC_Index.pdf
- The Technical ~~Decision~~ Guidance Documents are both extremely helpful and important

4

The requirements within 3745-300-07 form a connection with each section of the rule

- Risk assessments
- Remediation
- Engineering controls
- Institutional controls

5

Keep the goal in mind when developing the Phase I and Phase II

- Remember that the applicable standards for the Property will be developed in order to provide for the protection human health and the environment

6

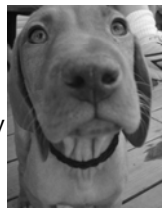
Completeness and accuracy of the Phase I are critical to the NFA

- **Failure of the identification of a potential release on the Property in the Phase I obviously leads to failure within the NFA**

7

The Phase I leads you to Develop a Phase II

- ..if a Phase I reveals …any reason to believe that a release of hazardous substances or petroleum has or may have occurred.. on the property.'



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The Initial direction of the Phase II will be bound by the Phase I

- The Phase I should provide information which is as concise as possible on the types of COCs expected and where those COCs are found on and off-Property

9

The completed Phase II may be significantly different than the initial

- The VAP is an iterative and heuristic process
- The VAP Phase I is primarily based on a review of the historical literature for the Property

10

The purpose of the Phase II

- '.. is to conduct an investigation sufficient to determine whether applicable standards are met ~~in all identified areas and affected media.~~…

11

VAP Applicable Standards

- It is your duty as a Certified Professional to determine which applicable standards apply
- This responsibility is based on your understanding of the Rules, the characteristics of the Property, and the proposed end use of the Property

12

Identification of the Identified Areas

- Each of the potential releases on the Property must be investigated within the Phase II
- The location of the release is labeled an Identified Area and may extend from on-Property to off-Property

13

Off-Property impacts and the connection to the release from On-Property

- The Covenant not to Sue issued to the Volunteer is particular in that it is 1) chained to and runs with the described Property

14

Off-Property impacts and the connection to the release from On-Property

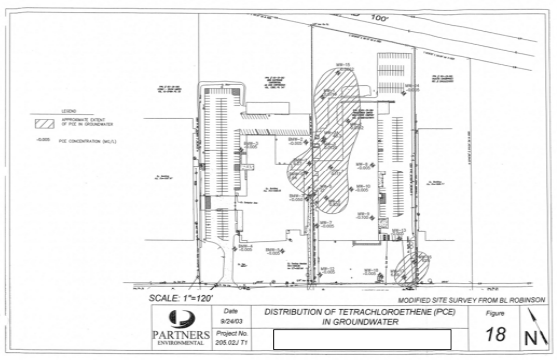
2) defined by the releases that occurred on the Property
3) only addressing off-Property considerations when on-Property releases ***are*** impacting off-Property receptors

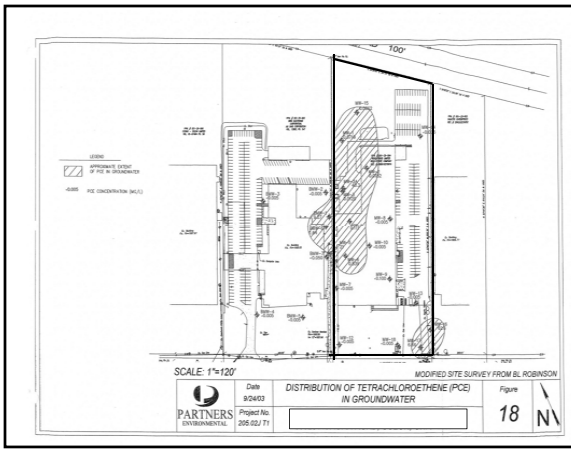
15

Off-Property emanation of ground water containing VOCs traveling below occupied buildings

- In this example the demonstration must be made that applicable standards are met for the off-Property receptor as it is reasonable to anticipate an impact to those receptors from the on-Property release

16





Environmental media within the VAP

- Soil
- Surface water
- Bedrock
- Air
- Sediment
- Ground water
- Soil gas
- and transitional zones between media

19

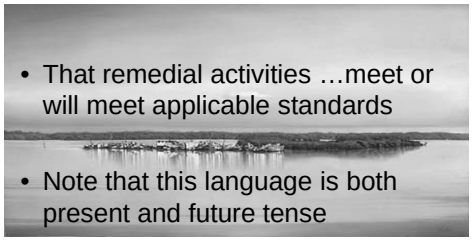
20

Release defined in the VAP in 3745-300-01

- '… any spilling, leaking, pumping, emitting, emptying, discharging, injecting, escaping, leaching….of any hazardous substance or petroleum into the environment..'

21

Phase II investigation be sufficient to determine



- That remedial activities …meet or will meet applicable standards
- Note that this language is both present and future tense

22

Data sufficient to determine -07(F)(1)-(9)

- Pathway completeness
- POGWMUPUS
- Applicable standards
- COC concentrations
- Ground water classification
- Ground water yield
- Source areas to ground water

23

Phase I update outside of 180 days

- Review of chain of title
- Property's regulatory information
- Land use information
- Certified Professional inspection
- See TGC document VA30007.09.007

24

The use of previously acquired data for an NFA

- All previously generated data should be available for the CP review within the Phase I
- Confirmation samples must be taken to support determinations made through the use of ‘old’ data

25

Collection of confirmation data in a manner consistent with the Rule

- Use of Certified Laboratory (CL) data
- Sample numbers should equal at least 10% of the sample number being confirmed

26

Inclusion of appropriately confirmed data

- CP may determine that use of both the confirmed and confirmation data can be used to support a demonstration with the VAP and satisfy the purpose of the Phase II

27

Regional characteristics of the Property

- Regional understanding of geologic formations, hydrogeology, physical parameter, surface water interactions etc. *will* impact your determinations relative to complete pathway determinations and ground water response requirements

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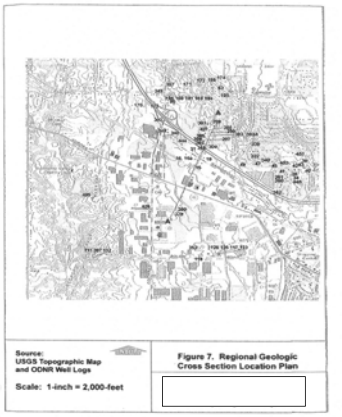

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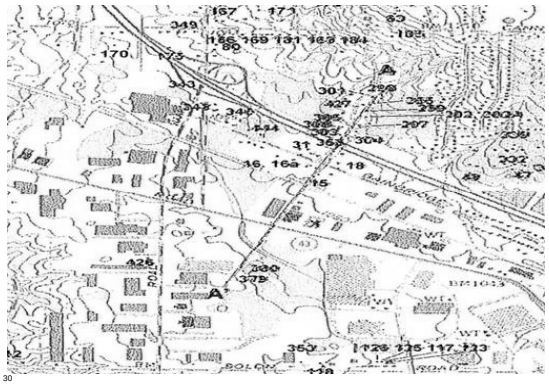

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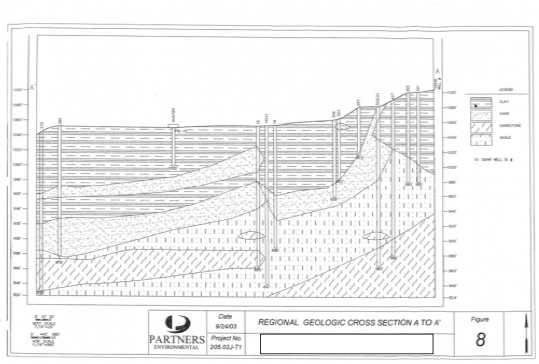

31

Defining COCs on the VAP Property

- Specific use lists derived from the Phase I can limit the number of COCs that a CP is required to investigate
- Broad suites of analytes will be required when less of the Site history is known

32

The Phase II investigation often centers about the Identified Areas

- Each Identified Area must be investigated
- All sources and all source areas must be investigated
- All affected media must be investigated

33

The morphing of the Phase II

- Remember that during the completion of the Phase II your understanding of the Property may change and your Phase II must reflect this

34

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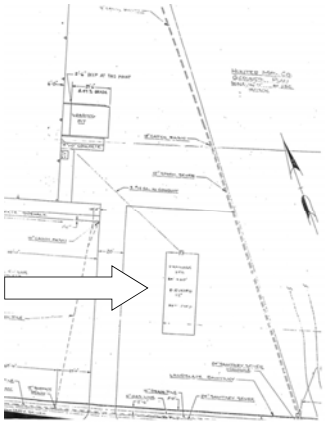

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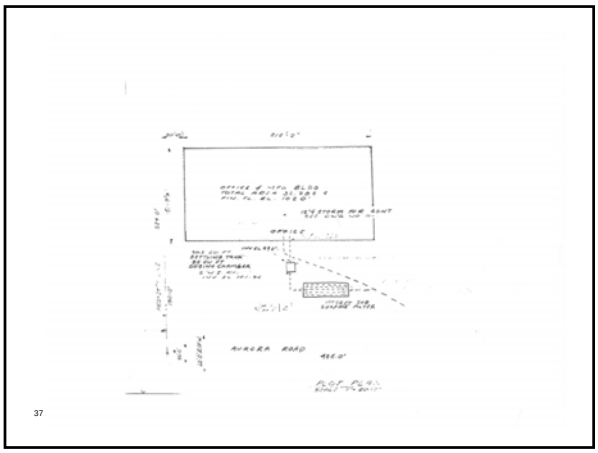

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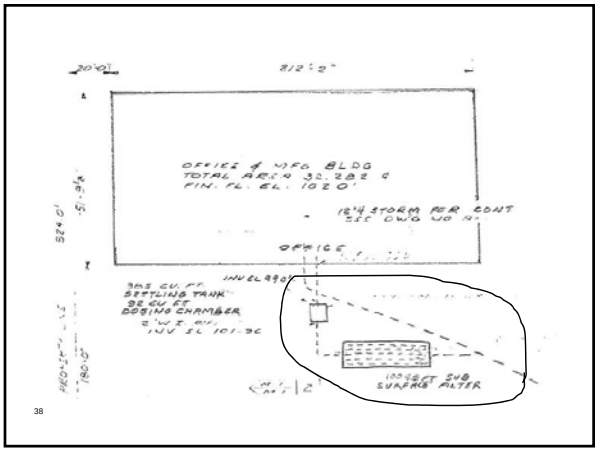
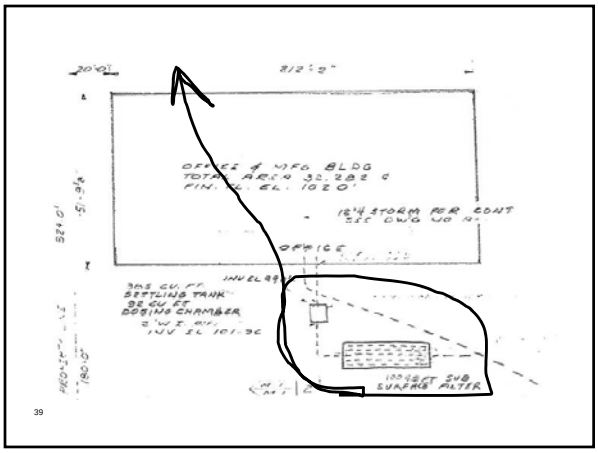

OFFICE & MFG. BLDG
TOTAL AREA 32,282 ±
FIN. FL. EL. 1020'
18"ϕ STORM PIPE CONT
SEE DWG NO 14
OFFICE
3845 CU. FT.
SETTLING TANK
32 CU. FT.
DOSING CHAMBER
2"W I PIPE
INV EL 101.30
INV EL 99.0
100 SQ FT SUB
SURFACE FILTER
524.0'
180.0'

38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524.0'
180.0'

39

Sampling Environmental Media

- The sampling must be reliable and representative for the media sampled
- Media - soil, sediment, surface water, ground water, bedrock, soil gas and air

40

Are asbestos containing materials considered media?

41

42

Sampling that ensures 'Reliable and Representative'

- Spatial and temporal variations must be accounted for when sampling

43

Hydrogeologic conditions and time

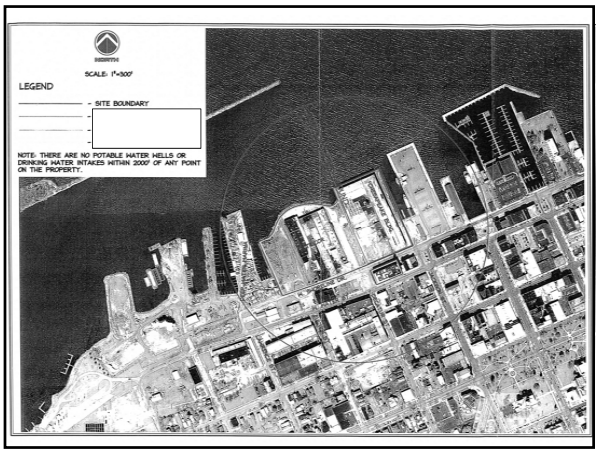
- Completing the Phase II within a time frame may be difficult
- Accurate ground water flow determinations might require changes due to seasonal fluctuations

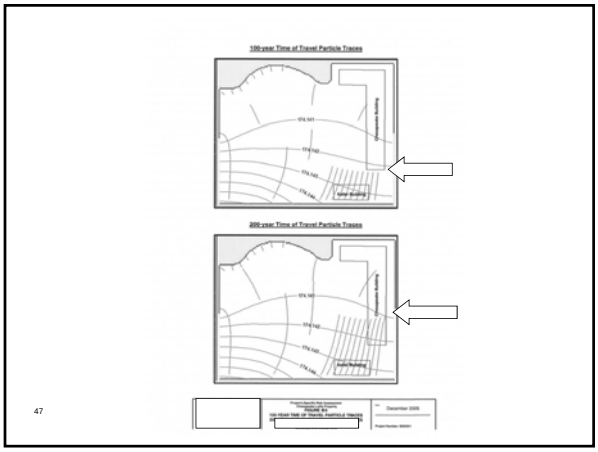
44

An Example Property on Sandusky Bay

- Accurate ground water flow determinations concerning the Bay and the shore
- Off-Property applicable standards relied upon the representative sampling procedures and results

45





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Current and reasonably anticipated land use

- Populations on and off of the Property are identified
- Populations can include residents, visitors, commercial and industrial workers, construction workers, and ecological resources

48

Pathway completeness determination following 3745-300-07 ~~(D)(2)~~ (F)(1)

- Source, Source Area, or affected media
- Receptors and applicable points of compliance
- Transport mechanism

49

Now in NFA Form Section D – Table 3
Summary of Exposure Pathways

[Comment: Table 1: Potential Human Exposure Pathways]

Exposure/ Contact Medium	Transporting/ Source Medium	Route of Exposure	Pathway
Ground water	Direct contact	Ingestion	Ground water containing dissolved or suspended chemicals of concern is ingested by on or off-property receptors using ground water
Ground water	Direct contact	Dermal contact	Ground water containing dissolved or suspended chemicals of concern is used for bathing/showering or is contacted incidentally during other potable or process use by on or off-property receptors
Ground water	Soil to ground water	Ingestion	Ground water containing chemicals of concern which have leached from soil is ingested by on or off-property receptors using ground water as drinking water
Ground water	Soil to ground water	Dermal contact	Ground water containing chemicals of concern which have leached from soil is used for bathing/showering or is contacted incidentally during other potable or process use by on or off-property receptors using ground water
Air	Ground water to air	Inhalation	Volatiles released from ground water containing chemicals of concern are inhaled during bath/shower or inhaled incidently during other potable or process use by on or off-property receptors
Air	Soil to air	Inhalation	Volatiles released from ground water containing chemicals of concern enter buildings through basement or foundation and are inhaled by on or off-property receptors occupying buildings
Air	Soil to air	Inhalation	Volatiles released to outdoor air from soil containing chemicals of concern are inhaled by on or off-property receptors
Air	Soil to air	Inhalation	Particulates released to outdoor air from soil containing chemicals of concern are inhaled by on or off-property receptors

50

Pathway completeness example

- Potentially complete pathways were determined incomplete through the use of site specific data, regional data and the understanding of the transport mechanism

51

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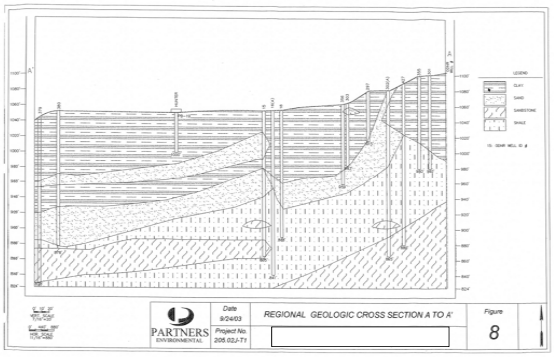


53

Ground Water Classification and Response Requirements

- These citations within Rule -07 will be presented in the Ground Water presentation
- Paragraphs 3745-300-07 (F)(2)(3) and (7) ~~(D)(3),(4) and (8)~~
- Section 3745-300-07 ~~(F)~~ (G)

54

Applicable standards within the Phase II

- Each COC and complete pathway must be considered
- Usually a combination of generic and standards developed using a Property Specific Risk Assessment

55

Situations without an Applicable Standard

- COCs at or below background
- Consideration of de minimus
- Spurious and tentatively identified compounds
- Laboratory contamination

56

Concentrations of Chemicals of Concern (COC) 3745-300-07 ~~(E)(4)~~ (F)(5)(a)

- Surface Water
- Sediment
- Soil
- Ground Water

57

Determining the Soil or Sediment Exposure Point Concentration

- Wholly within the Identified Area (IA)
- Sufficient numbers to develop a representative data set
- Use of the 95% UCL
- Minimum of three samples within the IA when a maximum bias is possible

58

95% Upper Confidence Level (UCL)

- The limit within a data set that represents the value at which, if random samples are taken from the data set, only 5% of these random samples would exceed the 95% UCL

59

95% Upper Confidence Level (UCL)

- TGC document VA30007.09.028 directs the CP to use the US EPA ProUCL software
- This can be downloaded from the National Exposure Research Laboratory http://www.epa.gov/

60

	Analytes			Status			Verification Non-Compliance				
	PERC	TCE	VC					Re-Sampling			
Sample Number	127-18-4	79-01-6	75-01-4	GOOD	FAIR	POOR	Notes	Number	N/S	E/W	Depth
HW-41S-90W-97.6	29000	380	0		X		Overexcavated 9/7/04 (Rolloff 118)	HW-15S-102W-97.7	15S	102W	97.7
HW-30S-92W-95.5	10600	0	0	X							
HW-36S-96W-96.8	87400	67	0			X	Overexcavated 9/7/04 (Rolloff 118)	HW-30S-92W-95.5	30S	92W	95.5
HW-15S-102W-97.7	32.7	0	0	X							
HW-7S-80W-96.6	4680	34	0	X							
HW-17S-85W-88.9	81000	0	0			X					
HW-14S-81W-89.3	151	0	0	X							
HW-17S-74W-89.9	688	0	0	X							
HW-17S-74W-88.1	389	0	0	X							
HW-26S-70W-88.6	141	0	0	X							
HW-23S-56W-90.6	19	0	0	X							
HW-14S-52W-89.3	7.43	0	0	X							
HW-10S-60W-89.9	11	0	0	X							
HW-15S-58W-87.8	60	0	0	X							
HW-14S-7W-96.8	599	55.5	28.5	X							
HW-2N-7W-97.7	273	333	0	X							
HW-2N-7W-DUP	223	55.2	0	X							

61

Determining the Ground Water Exposure Point Concentration

- Sampling methodology of appropriate quality
- Numbers and timing of sampling to address seasonal variations and geologic heterogeneity

62

Determining the Ground Water Exposure Point Concentration

- Location location location
- Direction of flow
- Plume size
- Release date
- Screening information

63

Ground Water Sampling Techniques in the VAP

- Properly designed and installed monitoring wells
- TGC document VA30007.09.012 indicates that direct push CANNOT be used for yield testing for classification
- But may be used for screening purposes and COC determinations

64

Ground Water Sampling Techniques in the VAP

- Ohio EPA prefers unfiltered samples of ground water
- TGC Document VA30007.09.011 allows for the consideration of filtering with certain criteria

65

	Sample	MW-6	MW-6R	MW-7	MW-8	MW-12
Total Metals	Date	4/22/03	5/27/03	5/20/03	4/22/03	5/21/03
Aluminum, ICPMS	mg/L	NT	**0.757**	**8.3**	NT	**1.62**
Aluminum, Dissolved, ICPMS	mg/L	NT	<0.050	<0.050	NT	<0.050
Antimony, ICPMS	mg/L	NT	<0.0020	**0.002**	NT	**0.0016**
Antimony, Dissolved, ICPMS	mg/L	NT	<0.0010	**0.0024**	NT	**0.002**
Arsenic, ICPMS	mg/L	**0.0177**	<0.0050	**0.0064**	<0.0209	<0.0050
Arsenic, Dissolved, ICPMS	mg/L	NT	<0.0050	<0.0050	NT	<0.0050
Barium, ICPMS	mg/L	**0.226**	**0.0511**	**0.19**	**0.381**	**0.115**
Barium, Dissolved, ICPMS	mg/L	NT	**0.0382**	**0.102**	NT	**0.108**
Beryllium, ICPMS	mg/L	NT	<0.0010	<0.0010	NT	<0.0010
Beryllium, Dissolved, ICPMS	mg/L	NT	<0.0010	<0.0010	NT	<0.0010
Cadmium, ICPMS	mg/L	<0.0020	<0.0010	<0.0010	<0.0020	<0.0010
Cadmium, Dissolved, ICPMS	mg/L	NT	<0.0010	<0.0010	NT	<0.0010
Chromium, ICPMS	mg/L	**0.0301**	<0.0020	**0.0264**	**0.0411**	**0.0036**
Chromium, Dissolved, ICPMS	mg/L	NT	<0.0020	<0.0020	NT	<0.0020
Cobalt, ICPMS	mg/L	NT	<0.0050	**0.0079**	NT	<0.0050
Cobalt, Dissolved, ICPMS	mg/L	NT	<0.0050	<0.0050	NT	<0.0050
Lead, ICPMS	mg/L	**0.27**	**0.0018**	**0.135**	**0.39**	**0.0258**
Lead, Dissolved, ICPMS	mg/L	NT	<0.0010	<0.002	NT	<0.0010

66

Actionable Ground Water in the VAP

- Actionable ground water defined in 3745-300-01(A) (~~19~~) (58)
- One and one-half gallons within eight hours and a hydraulic conductivity greater than 5.0×10^{-6} centimeters per second

67

Yield and Hydraulic Conductivity

- Yield testing should be biased to the location of highest yield
- Hydraulic conductivity should be done throughout the site

68

Yield determination in Ground Water classification

- If yield is determined to be greater than thirty-five percent below the threshold for a particular classification, then additional yield testing is unnecessary

69

Actionable Ground Water in the VAP

- The CP must demonstrate that the potential Ground Water is not Ground Water but may assume that Ground Water is Ground Water

70

Yield and Hydraulic Conductivity Data

- ~~TDC document VA30007.03.007~~ TGC document VA30007.09.013
- Central tendency parameters should be used for the determination
- Arithmetic mean for normal and geometric mean for log-normal distributions

71

Off-Property data in the use of ground water classification

- On-Property data is generally required, for example:
- Determining that GW is not actionable, and that contaminated GW is not Class A

72

Source or source area determinations for GW

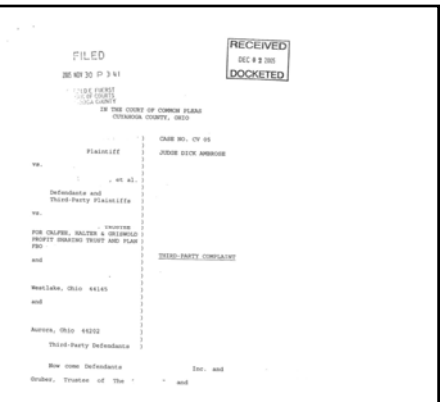
- Response requirements differ when a demonstration is made of off-property sources to on-property contamination of ground water (see 3745-300-10)

73

Quality information

- Quality assurance and quality control are critical to success within the VAP
- The Covenant Not to Sue is a release of liability from the State
- Follow a Work Plan

74



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IN THE COURT OF COMMON PLEAS
CUYAHOGA COUNTY, OHIO

CASE NO. CV 05

Plaintiff

JUDGE DICK AMBROSE

vs.

, et al.

Defendants and
Third-Party Plaintiffs

vs.

TRUSTEE
FOR CALFEE, HALTER & GRISWOLD
PROFIT SHARING TRUST AND PLAN
FBO

THIRD-PARTY COMPLAINT

and

Westlake, Ohio 44145

and

Aurora, Ohio 44202

Third-Party Defendants

Now come Defendants Inc. and

Gruber, Trustee of The and

75

Use Certified Laboratories for data analysis

- Certified Labs are required for most analytical requirements
- These labs are certified for each particular method and not as a whole

76


OhioEPA

Ohio Environmental Protection Agency
Division of Emergency and Remedial Response
Voluntary Action Program

Under the authority of Ohio Revised Code Section 3746.04(B) and Ohio Administrative Code Rule 3745-300-04

Certifies

STL North Canton
4101 Shuffel Drive, NW
North Canton, OH 44720

Certified Laboratory

GREAT SEAL OF THE STATE OF OHIO

AUG 23 2006

AUG 23 2006

SCOPE, LIMITATION, OBLIGATIONS AND RESPONSIBILITIES OF CERTIFICATION ON REVERSE SIDE

Use Certified Laboratories for data analysis

- Remember it is the responsibility of the CP to ensure that detection limits are low enough to demonstrate that applicable standards are or will be met

78

Lack of Certified Laboratory for the COC

- ~~TDC document VA30007.03.020~~ TGC document VA30007.09.025
- Certify a method with a CL willing to run through the process
- Develop an alternate remedial solution

79

The use of modeling within the VAP

- Ground Water plume travel
- Indoor Air concentration predictions
- Leach based modeling
- Ground Water to Surface Water modeling

80

Protecting Ground Water meeting Unrestricted Potable Use Standards

- ~~TDC 07.03.014~~ TGC document VA30007.09.020 describes the possibility of determining a 95% UCL for ground water concentrations,

81

Paragraph ~~(F)~~ (G) of Rule 7 describes the hurdles that models must clear

- Generally accepted and peer reviewed or code verified and scientifically valid
- Used in an appropriate and reasonable manner

82

The Information attained through modeling is qualitative

- The CP must determine if the modeling exercise is legitimate and usable

83

Determine that Applicable standards have been met

- Determine the appropriate point of compliance
- 10 feet for Residential or Unrestricted
- 2 feet for Industrial/Commercial
- Construction Worker is variable

84

	Identified Area - Western Property Line							
	VAP Data							
Constituent of Concern[3] — Boring ID:	PB-10	PB-13	PB-13	PB-14	PB-14	PB-15	PB-15	BMW-10A
Depth:	0-2'	0-2'	12-16'	0-2'	12-16'	0-4'	8-12'	10-12'
Date:	5/19/03	5/20/03	5/20/03	5/20/03	5/20/03	5/20/03	5/20/03	6/25/04
SVOCs (Method 8270B)								
Acenaphthene		<0.200		<0.200		1.59		
Acenaphthylene		<0.200		<0.200		<0.200		
Anthracene		<0.200		<0.200		2.1		
Benzo[a]anthracene		<0.200		<0.200		4.73		
Benzo[a]pyrene		<0.200		<0.200		3.57		
Benzo[b]fluoranthene		<0.200		<0.200		4.95		
Benzo[g,h,i]perylene		<0.200		<0.200		1.6		
Benzo[k]fluoranthene		<0.200		<0.200		1.91		
Chrysene		<0.200		<0.200		4.25		
Dibenz[a,h]anthracene		<0.200		<0.200		0.626		
Fluoranthene		<0.200		<0.200		10.4		
Fluorene		<0.200		<0.200		1.83		
Indeno[1,2,3-cd]pyrene		<0.200		<0.200		2.1		
Naphthalene		<0.200		<0.200		0.932		
Phenanthrene		<0.200		<0.200		13.9		
Pyrene		<0.200		<0.200		9.09		

85

Points of compliance for Ground Water

- The Protection of Ground Water Meeting Unrestricted Potable Use Standards (POGWMUPUS)
- Ground Water response requirements that are developed in 3745-300-10

86

Comparing Exposure Point Concentrations to Applicable Standards

- Generic values
- Property specific values
- Engineering controls
- Institutional controls

87

Background determination

- Following 3745-300-07(H)
- Demonstrating that ~~naturally occurring~~ COCs are found in concentrations at or below the native concentrations

88

89

Phase II Report

- Phase I with updates
- Phase II Investigation Work Plan
- Risk Assessment
- Remedial confirmation sampling
- Determination that Applicable Standards are met on the Property

90