

**Environmental
Resources
Management**

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24 January 2007

Mr. Matt McClincy
Oregon Department of Environmental Quality
Northwest Region
2020 Southwest 4th Avenue, Suite 400
Portland, Oregon 97201-4987



Subject: Former Arkema Portland Plant
Responses to ODEQ Comments on the Upland Remedial
Investigation Report, Lots 3 & 4 and Tract A
ECSI No. 398

Dear Matt,

This letter, prepared by ERM-West, Inc. (ERM) on behalf of Legacy Site Services LLC (LSS), provides clarification requested by the Oregon Department of Environmental Quality (ODEQ) in a letter dated 15 December 2006. The ODEQ comments were related to the LSS 1 December 2006 letter regarding the December 2005 *Upland Remedial Investigation Report, Lots 3 & 4 and Tract A - Revision 1 (RI)*, prepared by Environmental Resources Management (ERM) for Arkema, Inc. (now LSS). Each of the ODEQ comments is provided below in italic font, followed by LSS's response.

Comment 1 - The plan view figures prepared for acetone, carbon tetrachloride, chloroform, 1,2-dichlorobenzene, 1,3-dichlorobenzene, 1,4-dichlorobenzene, tetrachloroethene, 1,1,1-trichloroethane and trichloroethene did not include available Lower Willamette Group in-water data (LWG). Please update these figures to include the LWG sediment, groundwater and transition zone pore water data.

Lower Willamette Group (LWG) groundwater and transition zone data have been added to the figures as requested. Revised figures are included as Attachment A. Sediment data have not been included as these data are not directly comparable to dissolved phase groundwater and transition zone water data. The LWG data presented on the figures were obtained from:

- *Round 2 Groundwater Pathway Assessment, Transition Zone Water Site Characterization Event – Draft (2005); and*
- *Round 2 Groundwater Pathway Assessment, Pilot Study (2004/2005).*

Consistent with LWG protocol, samples collected using “trident” sampling techniques (as opposed to “peeper” sampling techniques) are presented on the figures. However, it is noted that suspended solids may be inadvertently captured in water samples collected using trident sampling methodology. Similar to other direct push water sampling techniques, the inclusion of these suspended solids can cause falsely elevated analytical results. Therefore, these results are not as accurate or representative of actual water conditions as, for example, a properly developed groundwater monitoring well. The trident water sampling data, therefore, is not directly comparable to upland groundwater samples collected from monitoring wells and should be used carefully.

Comment 2 - The cross-sectional figures prepared for acetone, carbon tetrachloride, chloroform, 1,2-dichlorobenzene, 1-3-dichlorobenzene, 1,4-dichlorobenzene, tetrachloroethene, 1,1,1-trichloroethane and trichloroethene were not drawn through the monitoring well MWA-61 and MWA-67si locations. The unanticipated high levels of volatile organic compounds (VOC) detected in these two monitoring wells was the basis for DEQ's June 5, 2006 request that Arkema prepare additional summary figures of the VOC distribution to help illustrate the VOC distribution and potential source areas. DEQ requests that Arkema prepare new cross-sectional figures that illustrate the stratigraphy and VOC distribution upland and in-water at the MWA-61 and MWA-67si location. Relevant in-water data should be presented in the figures, and where the section alignment does not cross a relevant the in-water data point the in-water data should be projected onto the cross-section.

Revised cross-sectional figures depicting volatile organic compounds (VOCs) are attached. The cross-sectional figures have been revised to include wells MWA-61 and MWA-67si, as well as the in water data revealing the highest detections of VOCs.

Comment 3 - In addition to the assessment of the potential risks associated with hexavalent chromium in the Chlorate Plant soils (Arkema response # 13 to DEQ RI comments) the pending hot spot analysis and upland feasibility study will need to evaluate potential impacts to the beneficial use of groundwater from hexavalent chromium in vadose zone soils and potential remedial alternatives.

Comment noted.

Please call us at (425) 462-8591 if you have any additional questions.

Sincerely,



Erik C. Ipsen, P.E.
Project Manager



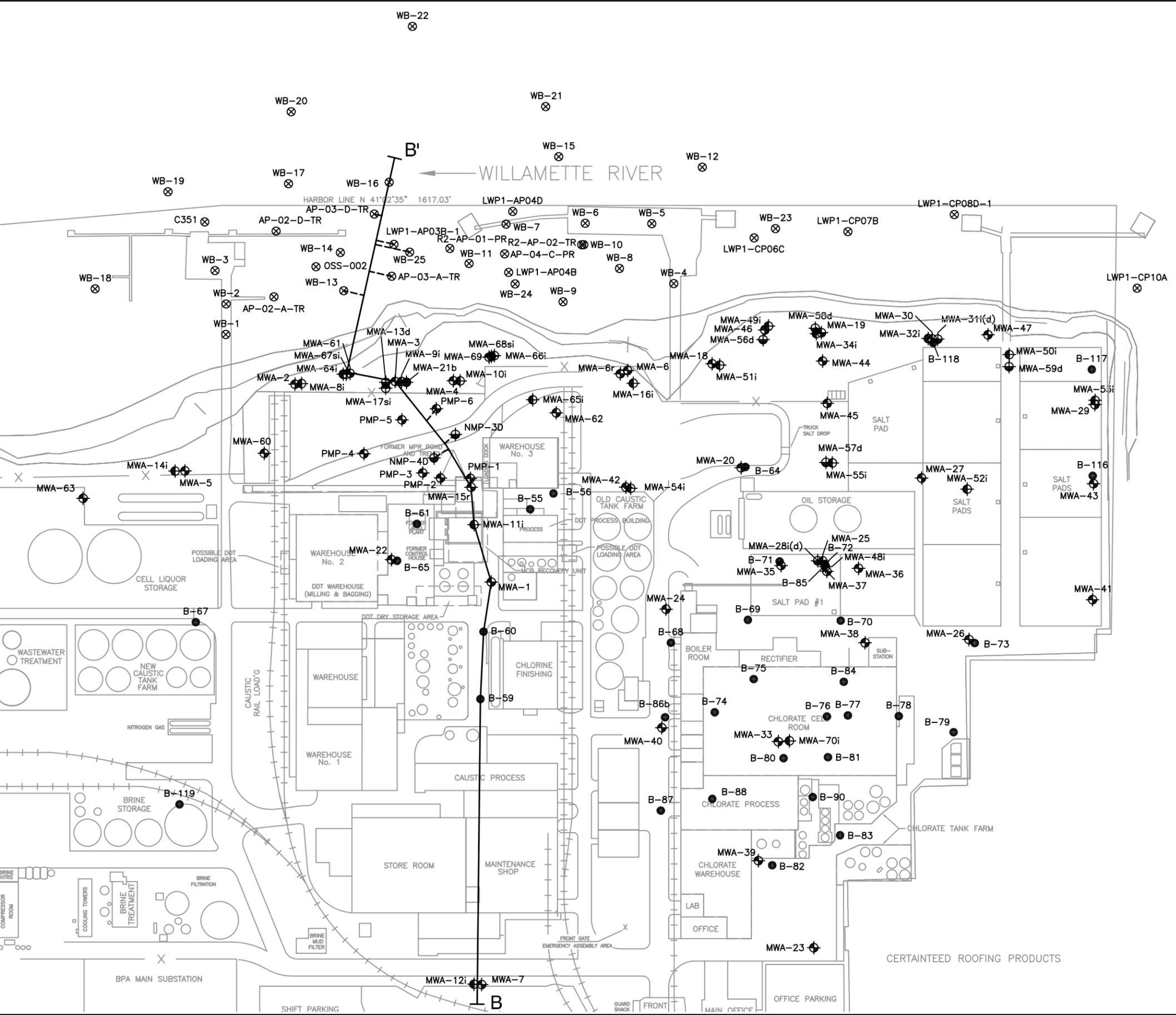
David P. Edwards, P.G.
Partner

Attachment

cc: Tom Gainer, DEQ
Todd Slater, LSS
Larry Patterson
Claudia Powers, Ater Wynne
David Livermore, Integral

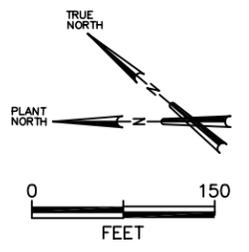
Attachment A
Revised Figures

Project No: 0020423.11
 Date: 01/10/07
 Drawn By: R. Olson
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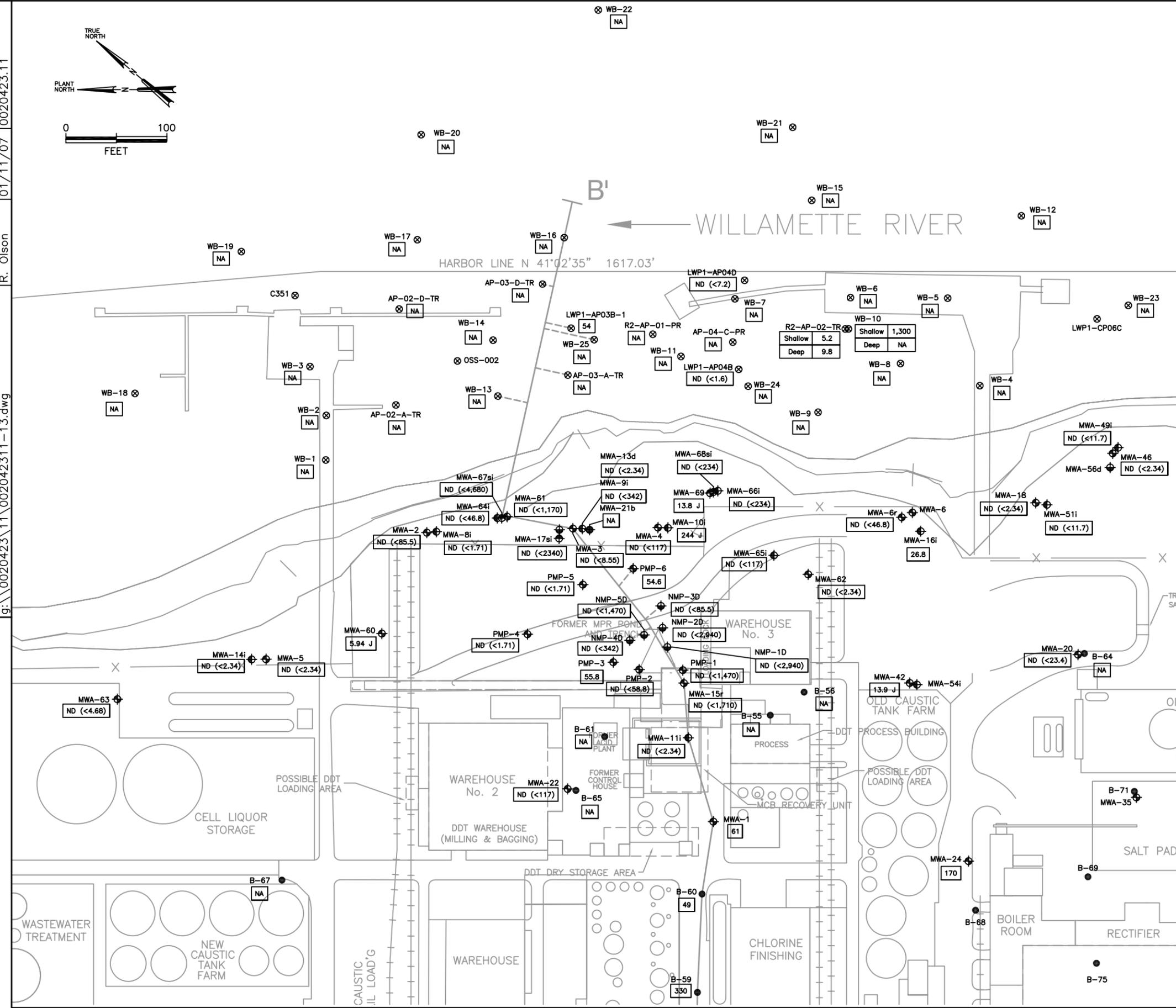
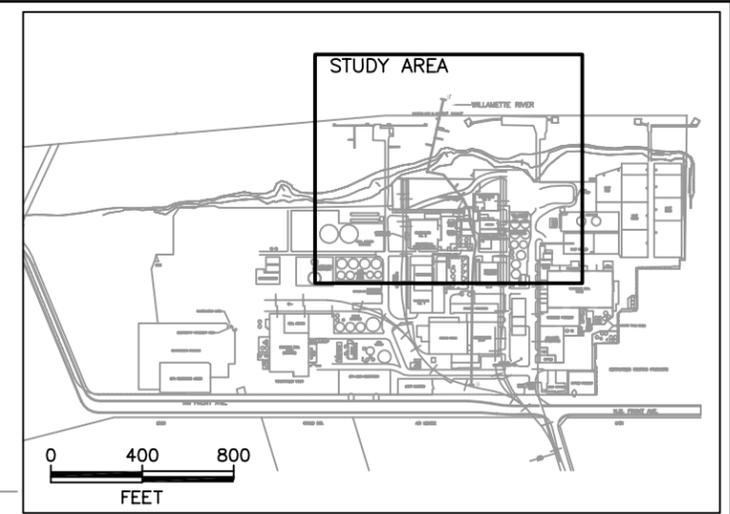
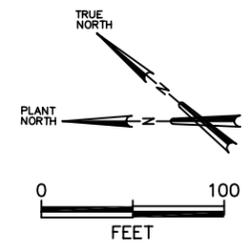
- MWA-47 Monitoring Well, Shallow Zone
- MWA-68si Monitoring Well, Shallow and Intermediate Zone
- MWA-49i Monitoring Well, Intermediate Zone
- MWA-56d Monitoring Well, Deep Zone
- MWA-21b Monitoring Well, Basalt
- B-61 RI Soil Boring
- WB-12 River Sample
- B-B' Cross Section Line



Note:
 Most buildings and structures noted on this diagram have been demolished and/or removed.

Figure 1
 Cross Section Location Map
 Arkema Inc.
 Portland, Oregon
 ERM 01/07

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- MWA-47 Monitoring Well, Shallow Zone
- MWA-68si Monitoring Well, Shallow and Intermediate Zone
- MWA-49i Monitoring Well, Intermediate Zone
- MWA-56d Monitoring Well, Deep Zone
- MWA-21b Monitoring Well, Basalt
- B-61 RI Soil Boring
- WB-12 River Sample

Shallow	45
Deep	ND(<25)

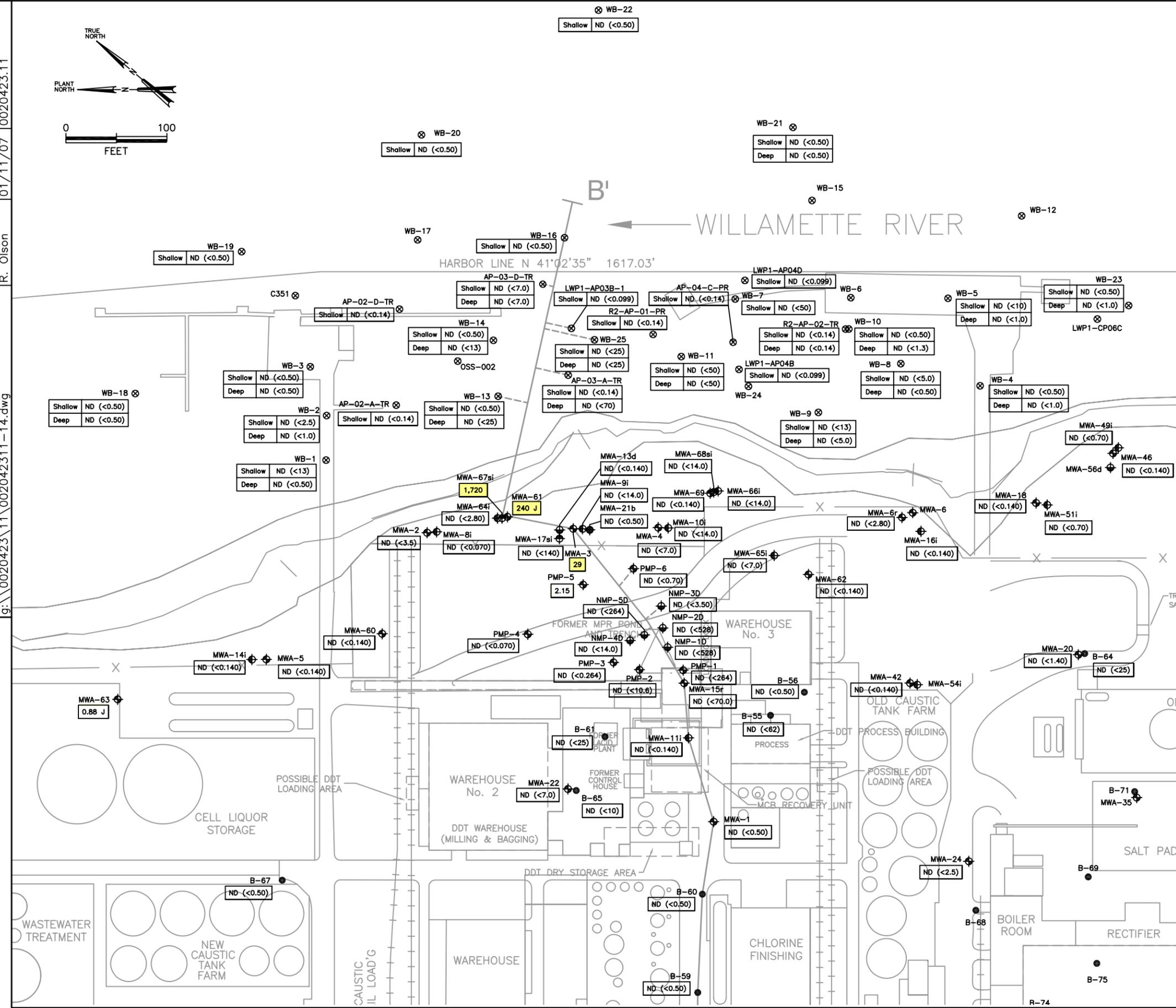
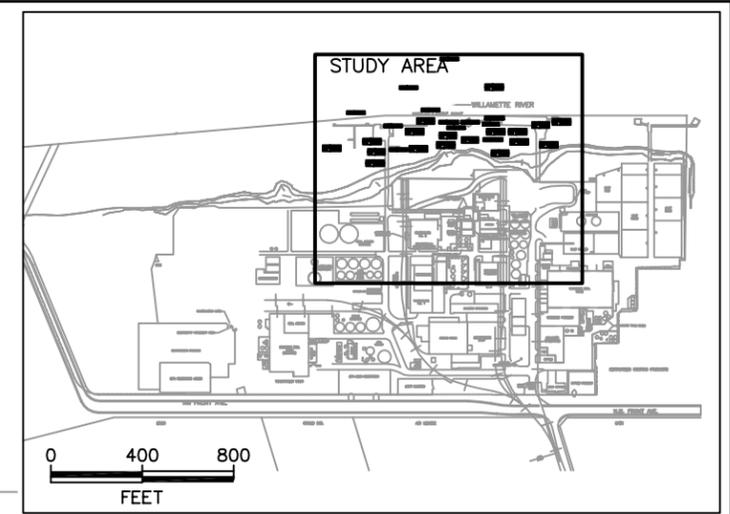
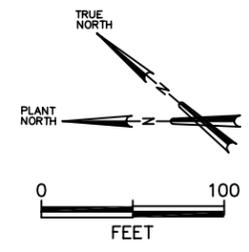
ND (<234) Acetone Concentration (µg/L)
 ND (<11.7) Not Detected (Detection Limit)
 ND (<85.5) Zone
 NA Not Available

Notes:

- 1) Concentrations are the most recent available for each sampling location. Sample dates range from 02/19/1999 to 08/05/06. See Table 1 for specific sample dates.
- 2) All reported concentrations are below the Joint Source Control screening level of 1,500 µg/L (Oak Ridge National Laboratory, Tier II SCV)
- 3) Most buildings and structures noted on this diagram have been demolished and/or removed.

Figure 2
Acetone Concentrations
Arkema Inc.
Portland, Oregon
 ERM 01/07

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- MWA-47 Monitoring Well, Shallow Zone
- MWA-68si Monitoring Well, Shallow and Intermediate Zone
- MWA-49i Monitoring Well, Intermediate Zone
- MWA-56d Monitoring Well, Deep Zone
- MWA-21b Monitoring Well, Basalt
- B-61 RI Soil Boring
- WB-12 River Sample

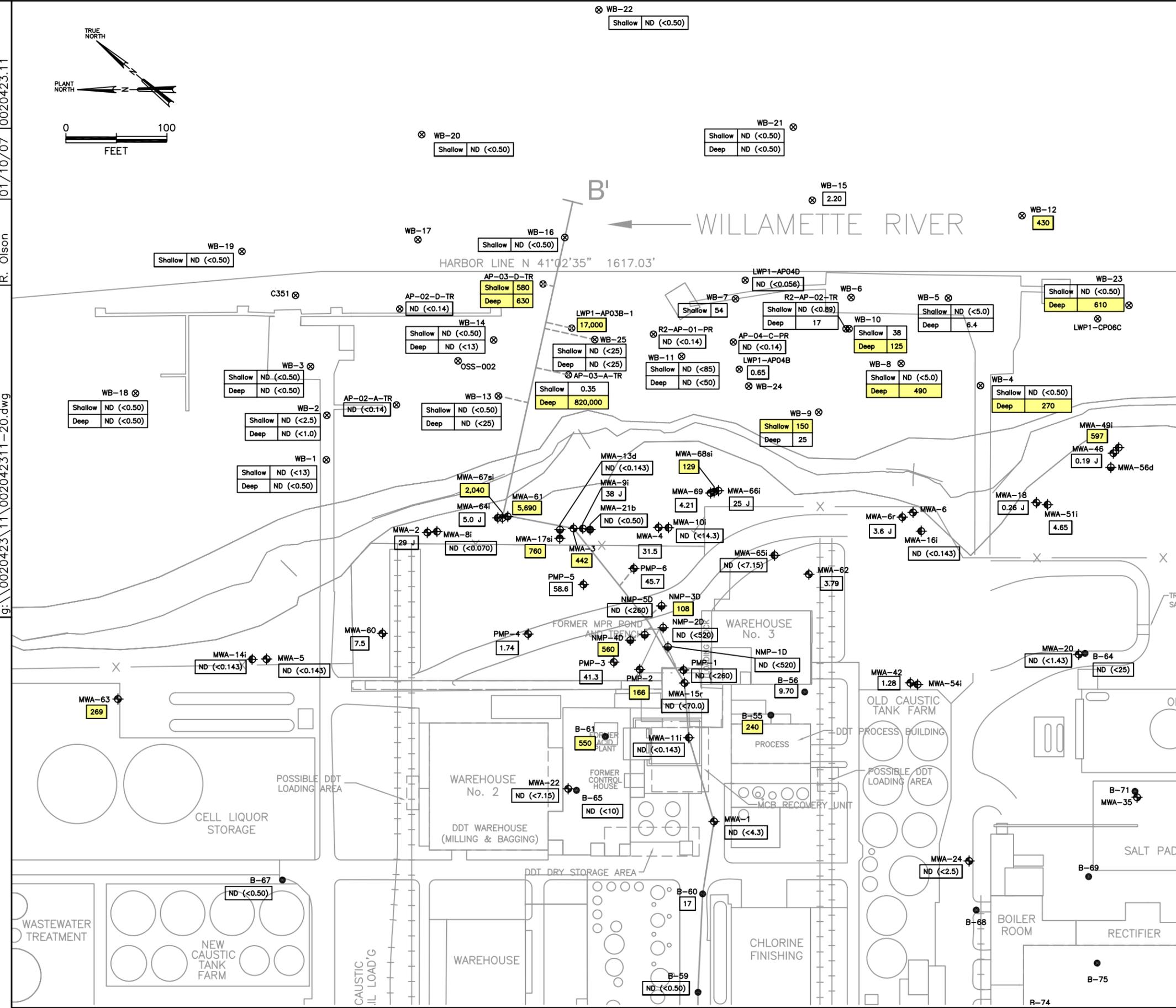
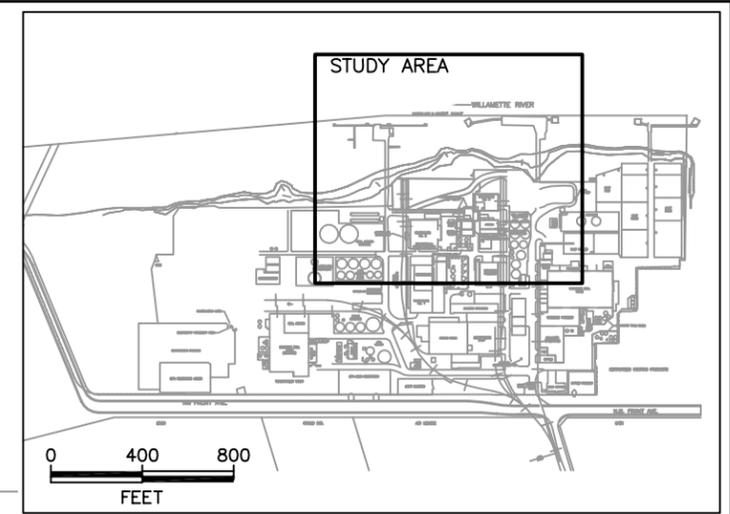
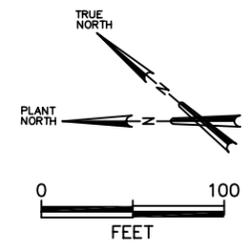
Shallow	45	Carbon Tetrachloride Concentration (µg/L)
Deep	ND (<25)	Not Detected (Detection Limit) Zone

Notes:

- Concentrations are the most recent available for each sampling location. Sample dates range from 02/19/1999 to 08/05/06. See Table 1 for specific sample dates.
- Shading indicates an exceedance of the EPA Maximum Contaminant Level for Drinking Water of 5 µg/L.
- Most buildings and structures noted on this diagram have been demolished and/or removed.

Figure 4
Carbon Tetrachloride Concentrations
 Arkema Inc.
 Portland, Oregon

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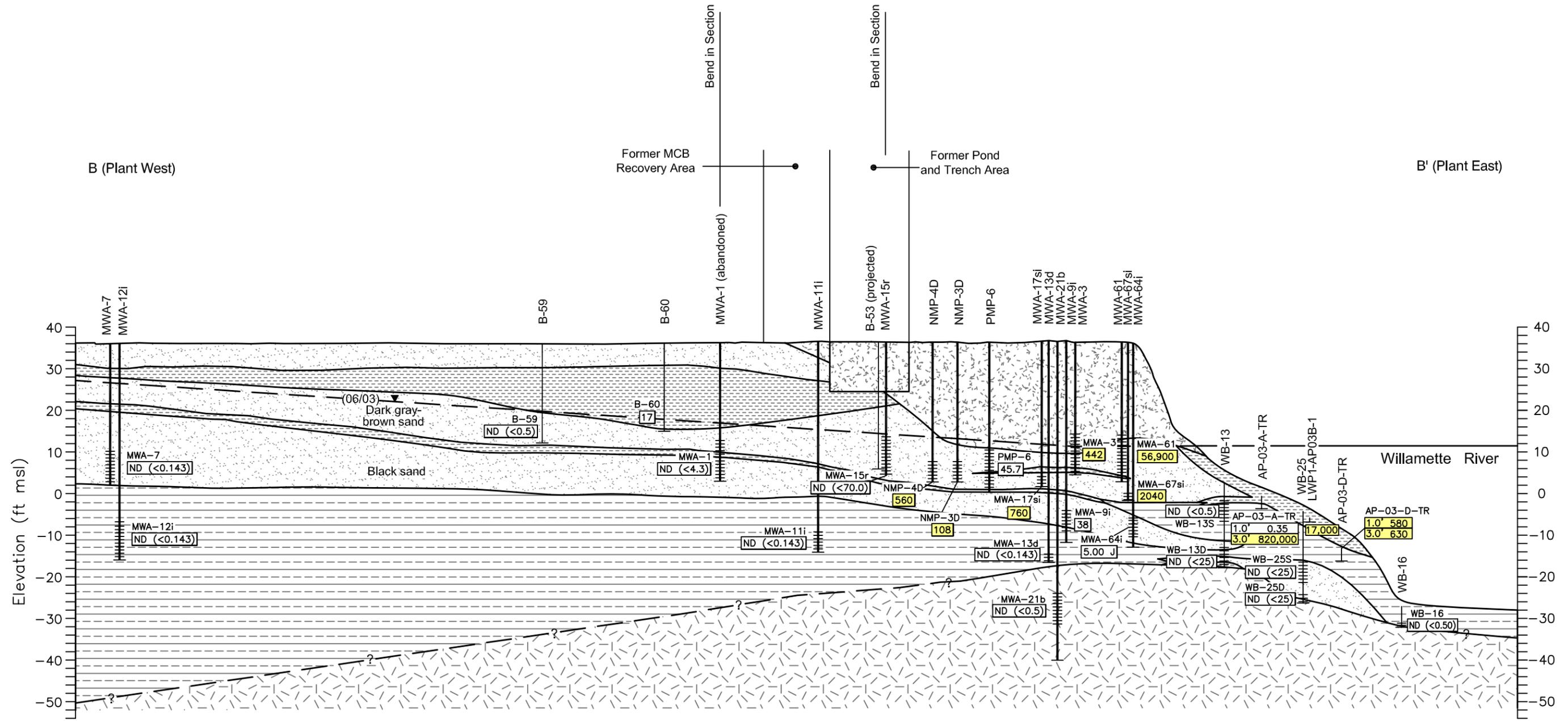
- MWA-47 ⊕ Monitoring Well, Shallow Zone
- MWA-68si ⊕ Monitoring Well, Shallow and Intermediate Zone
- MWA-49i ⊕ Monitoring Well, Intermediate Zone
- MWA-56d ⊕ Monitoring Well, Deep Zone
- MWA-21b ⊕ Monitoring Well, Basalt
- B-61 ● RI Soil Boring
- WB-12 ⊗ River Sample

Shallow	45
Deep	ND(<25)

Chloroform Concentration (µg/L)
 Not Detected (Detection Limit) Zone

Notes:
 1) Concentrations are the most recent available for each sampling location. Sample dates range from 02/19/1999 to 08/05/06. See Table 1 for specific sample dates.
 2) Shading indicates an exceedance of the EPA Maximum Contaminant Level for Drinking Water of 100 µg/L.
 3) MCL value given applies to the concentration of total trihalomethanes (Chloroform, bromodichloromethane, bromoform, and dibromochloromethane)
 4) Most buildings and structures noted on this diagram have been demolished and/or removed.

Figure 6
Chloroform Concentrations
 Arkema Inc.
 Portland, Oregon



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- Fill
- Sand with varying amounts of silt
- Silt with varying amounts of fine sand
- Silt with some clay and fine sand
- Basalt
- B-59 — Soil boring number
- MWA-1 — Well number
- Cased interval
- Screen interval
- Shallow-zone groundwater surface (approximate); June 2003; Based on monitoring well data only
- Inferred soil or geologic contact (queried where uncertain)
- NA — Not Applicable/Reported

- Well ID
- Chloroform Concentration ($\mu\text{g/L}$)
- Sampling Date

Shading indicates an exceedance of the EPA Maximum Contaminant Level for Drinking Water of 100 $\mu\text{g/L}$

MCL value given applies to the concentration of total trihalomethanes (Chloroform, bromodichloromethane, bromoform, and dibromochloromethane)

Note: Concentrations are the most recent available for each sampling location. Sample dates range from 02/19/99 to 08/05/06.

(Vertical Exaggeration = 4X)

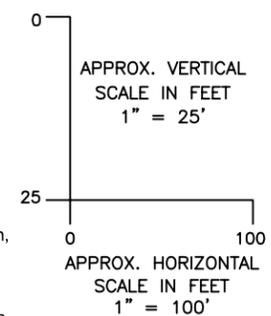
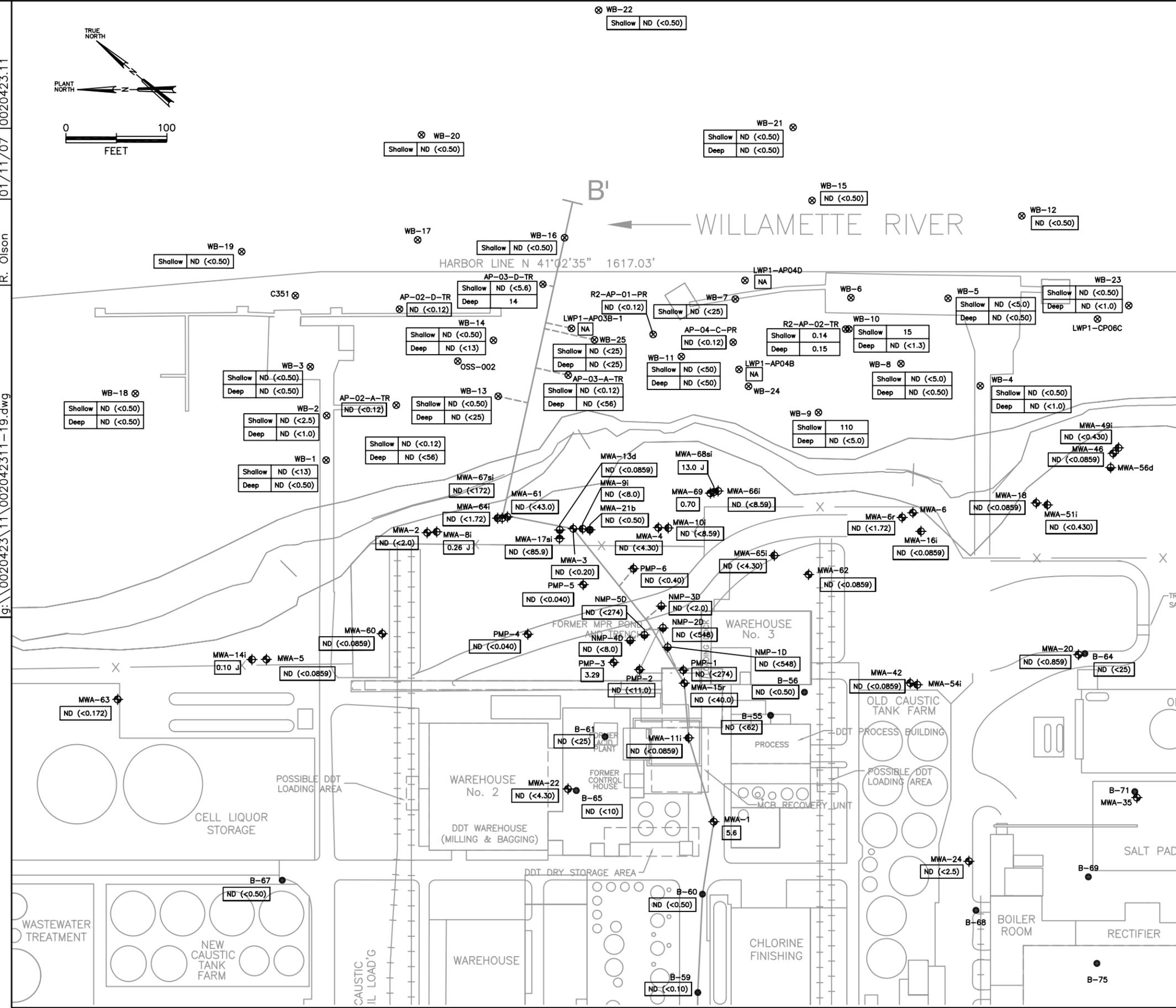
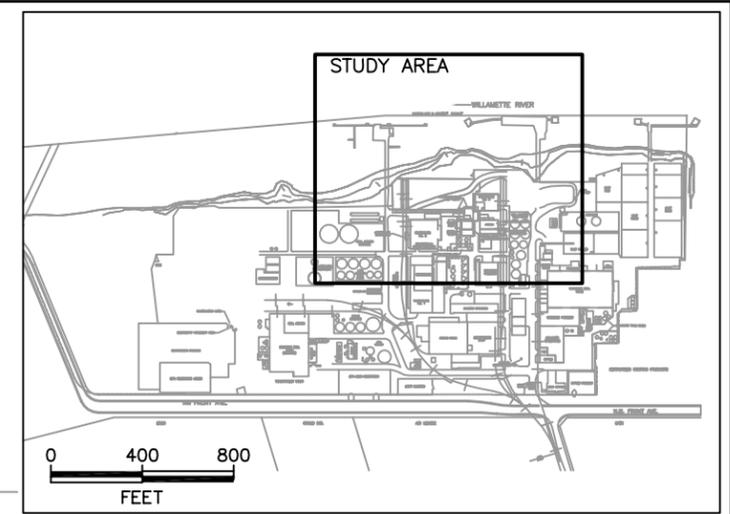
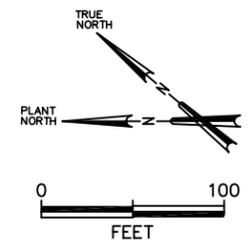


Figure 7
 Cross Section B-B'
 Chloroform Concentrations
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 Portland, Oregon

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- MWA-47 Monitoring Well, Shallow Zone
- MWA-68si Monitoring Well, Shallow and Intermediate Zone
- MWA-49i Monitoring Well, Intermediate Zone
- MWA-56d Monitoring Well, Deep Zone
- MWA-21b Monitoring Well, Basalt
- B-61 RI Soil Boring
- WB-12 River Sample

Shallow	45	1,2-Dichlorobenzene Concentration (µg/L)
Deep	ND (<25)	Not Detected (Detection Limit)
		Zone
	NA	Not Available

Notes:
 1) Concentrations are the most recent available for each sampling location. Sample dates range from 02/19/1999 to 08/05/06. See Table 1 for specific sample dates.
 2) Shading indicates an exceedance of the EPA Maximum Contaminant Level for Drinking Water of 600 µg/L.
 3) Most buildings and structures noted on this diagram have been demolished and/or removed.

Figure 8
1,2-Dichlorobenzene Concentrations
 Arkema Inc.
 Portland, Oregon

