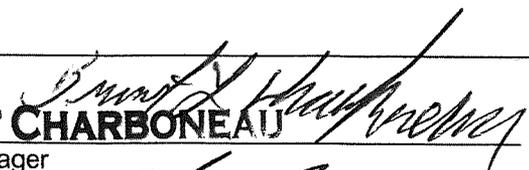
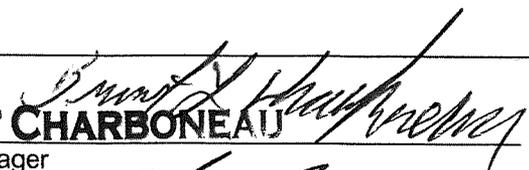
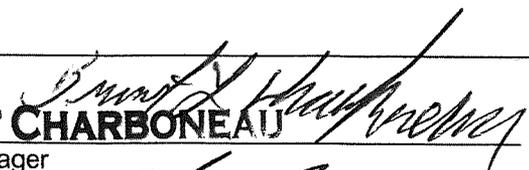


TRI-PARTY AGREEMENT								
Change Notice Number TPA-CN- 522	TPA CHANGE NOTICE FORM	Date: 25 May, 2012						
Document Number, Title, and Revision: <i>100-BC-5 Operable Unit Sampling and Analysis Plan, DOE/RL-2003-38 Rev. 1 (as modified by TPA-CN-240, 12/8/2008 and TPA-CN-293, 10/6/2009)</i>		Date Document Last Issued: 10/6/2009						
Originator: M.J. Hartman		Phone: 376-4385						
<p>Description of Change:</p> <ul style="list-style-type: none"> <li>Replace Table 2, "Groundwater Sampling Matrix for the 100-BC-5 Operable Unit" with Attachment 1.</li> <li>Replace Figure 2 with Attachment 2.</li> <li>Replace Table A.1 with Attachment 3.</li> <li>Append Attachment 4 to Table B.1.</li> </ul>								
<p><u>B.L. Charboneau</u> and <u>L.C. Buelow, EPA</u> agree that the proposed change DOE Lead Regulatory Agency modifies an approved workplan/document and will be processed in accordance with the Tri-Party Agreement Action Plan, Section 9.0, <i>Documentation and Records</i>, and not Chapter 12.0, <i>Changes to the Agreement</i>.</p> <p>Table 2 of the above referenced Sampling and Analysis plan (SAP) (as modified by TPA-CN-293) has been revised to (a) incorporate wells installed since 2009, (b) remove 2 decommissioned wells, (c) add volatile organic analyses to several wells, and (d) adjust sampling frequencies of some wells. Figure 2 (p. 10 of the SAP) has been revised to show the new wells. Table A.1 from TPA-CN-240 has been replaced. The new wells have been added to Table B.1.</p> <p>Deleted material is shown with <u>single line strikethrough</u>.</p>								
<p>Note: Include affected page number(s)</p>								
<p>Justification and Impacts of Change:</p> <ul style="list-style-type: none"> <li>Ten wells were installed in 2009 through 2011 in support of the Remedial Investigation. The new wells need to be incorporated into the ongoing, routine sampling network.</li> <li>Wells 199-B8-7 and 199-B8-8 were decommissioned in 2011.</li> <li>Low levels of chloroform and trichloroethene were detected in several wells in 2010 RI sampling. Volatile organic compounds will be analyzed in selected wells to track trends.</li> <li>Sampling frequencies are being adjusted in some wells to account for changing contaminant trends and ongoing excavation of the 100-C-7 and 100-C-7:1 waste sites.</li> </ul>								
<p>Approvals:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"> <p> <b>BRIANT CHARBONEAU</b> DOE Project Manager</p> </td> <td style="width: 50%; border: none;"> <p><u>5-25-2012</u> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p> </td> </tr> <tr> <td style="border: none;"> <p> EPA Project Manager</p> </td> <td style="border: none;"> <p><u>5-25-2012</u> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p> </td> </tr> <tr> <td style="border: none;"> <p>N/A Ecology Project Manager</p> </td> <td style="border: none;"> <p>_____ <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p> </td> </tr> </table>			<p> <b>BRIANT CHARBONEAU</b> DOE Project Manager</p>	<p><u>5-25-2012</u> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p>	<p> EPA Project Manager</p>	<p><u>5-25-2012</u> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p>	<p>N/A Ecology Project Manager</p>	<p>_____ <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p>
<p> <b>BRIANT CHARBONEAU</b> DOE Project Manager</p>	<p><u>5-25-2012</u> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p>							
<p> EPA Project Manager</p>	<p><u>5-25-2012</u> <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p>							
<p>N/A Ecology Project Manager</p>	<p>_____ <input type="checkbox"/> Approved <input type="checkbox"/> Disapproved Date</p>							

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BRIANT CHARLOTTE

Table 2. Groundwater Sampling Matrix for the 100-BC-5 Operable Unit. [TPA-CN-293]

Well ID	Well Name	WAC Compliant	Contaminants of Concern(a)				Supporting Constituents and Parameters									
			Hexavalent-Cr (unfiltered)	Nitrate(e)	Strontium-90	Tridium	Alkalinity	Anions(b)	Metals (filtered, unfiltered)(c)	Gross Alpha	Gross Beta	Technetium-99	Specific Conductance(d)	Temperature(d)	Turbidity(d)	Water Level(d)
A4550	199-B2-12	C	BO	BO	BO	BO	BO	BO	BO				BO	BO	BO	BO
A4551	199-B2-13	C	BE	BE	BE	BE	BE	BE	BE				BE	BE	BE	BE
A4552	199-B3-1	N	A	BE	A	A	BE	BE	BE				A	A	A	A
A4553	199-B3-46	C	A	BO	A	A	BO	BO	BO				A	A	A	A
A4554	199-B3-47	C	A	BE	A	A	BE	BE	BE				A	A	A	A
A4555	199-B4-1	N	A	BE	BE	A	BE	BE	BE				A	A	A	A
A4557	199-B4-4	N			BE	BE							BE	BE	BE	BE
A5540	199-B4-5	C														A
A4558	199-B4-6	C														A
A5541	199-B4-7	C	BO	BO	BO	BO	BO	BO	BO				BO	BO	BO	BO
A4559	199-B4-8	C	BE	BE	BE	BE	BE	BE	BE				BE	BE	BE	BE
A4561	199-B5-1	N	A	BE	BE	A	BE	BE	BE				A	A	A	A
A4562	199-B5-2	C	A		BO	A							A	A	A	A
A4563	199-B8-6	C	A	BO	BO	A	BO	BO	BO	BO	BO		A	A	A	A
C5671	199-B8-7	C	Q	Q		Q	Q	Q	Q	Q	Q		Q	Q	Q	Q
C5672	199-B8-8	C	M	Q		Q	Q	Q	Q	Q	Q		M	M	M	M
A4565	199-B9-2	C	BE			BE				BE	BE		BE	BE	BE	BE
A4566	199-B9-3	C	BO	BO		BO	BO	BO	BO	BO	BO		BO	BO	BO	BO
A5293	699-63-90	N		BE		BE	BE	BE	BE	BO	BO		BE	BE	BE	BE
A5302	699-65-72	N				BE	BE	BE	BE				BE	BE	BE	BE
A5303	699-65-83	N				BE							BE	BE	BE	BE
A5305	699-66-103					BE							BE	BE	BE	BE
A5313	699-67-86	N				BO							BO	BO	BO	BO
A5315	699-68-105	N		BO		BO	BO	BO	BO				BO	BO	BO	BO
A5322	699-71-77	N		BO		BO	BO	BO	BO			BO	BO	BO	BO	BO
A5323	699-72-73	N		BE		BE	BE	BE	BE			BE	BE	BE	BE	BE
A5325	699-72-92	N		BO		BO	BO	BO	BO				BO	BO	BO	BO
None	Spring 037-1	-	A			A				A	A		A	A	A	
None	Spring 039-2	-	A			A				A	A		A	A	A	

Well ID	Well Name	WAC Compliant	Contaminants of Concern(a)				Supporting Constituents and Parameters								
			Hexavalent Cr (unfiltered)	Nitrate(a)	Strontium-90	Tritium	Alkalinity	Anions(b)	Metals (filtered, unfiltered)(c)	Gross Alpha	Gross Beta	Technetium-99	Specific Conductance(d)	Temperature(d)	Turbidity(d)
<p>Shading indicates change from TPA-CN-182. See Table A.1 for details.</p> <p>(a) Nitrate not identified as groundwater contaminant of concern in PNNL-14287, but was identified as such in DOE/RL-2005-40.</p> <p>(b) Anions—Analytes include but not limited to chloride, nitrate, and sulfate.</p> <p>(c) Metals—Analytes include but not limited to calcium, chromium, potassium, magnesium, and sodium.</p> <p>(d) Field parameter</p> <p>A = To be sampled annually.</p> <p>BE = To be sampled biennially in even-numbered fiscal years (e.g., fiscal year 2008).</p> <p>BO = To be sampled biennially in odd-numbered fiscal years (e.g., fiscal year 2009).</p> <p>C = Well is constructed as a WAC 173-160 resource protection well.</p> <p>M = To be sampled monthly.</p> <p>N = Well construction is not compliant with WAC 173-160 resource protection well requirements.</p> <p>Q = To be sampled quarterly.</p>															

Table 2. Groundwater Sampling Matrix for the 100-BC-5 Operable Unit (3 sheets). [complete revision]

Well	Field Parameters	Alkalinity	Anions <sup>a</sup>	Gross Alpha/Beta	Hexavalent Chromium <sup>b</sup>	Metals <sup>b,c</sup>	Strontium-90	Technetium-99	Tritium	Volatile Organics <sup>d</sup>	Month(s) Scheduled <sup>e</sup>	Screened Zone (top of unconfined unless otherwise noted)
<b>Clustered Wells</b>												
199-B2-12	BO	BO	BO		BO	BO	BO		BO		1	Ringold upper mud
199-B3-47	A	BE	BE		A	BE	A		A		1	
199-B3-51	BO	BO	BO		BO	BO	BO		BO		1	Bottom of unconfined aquifer
199-B2-14	A				A		A		A		1	
199-B2-15	BE				BE		BE		BE		1	Ringold upper mud
199-B4-14	M <sup>g</sup>	A	A	A	M <sup>g</sup>	A			M <sup>g</sup>		All	
199-B5-6	M <sup>g</sup>	A	A	A	M <sup>g</sup>	A			M <sup>g</sup>	A	All	Lower portion unconfined aquifer
<b>Single Wells</b>												
199-B2-13	BE	BE	BE		BE	BE			BE		1	
199-B2-16	S	A	A		S	A	S		S	A	1, 7	Lower portion unconfined aquifer
199-B3-1	A	BE	BE		A	BE	A		A		1	
199-B3-46	A	BO	BO		A	BO	A		A		1	
199-B3-50	A				A		A		A		1	
199-B4-1	A	BE	BE		A	BE	A		A		1	
199-B4-4	BE				BE		BE		BE		1	
199-B4-7	S	A	A		S	A	A		S		1, 7	
199-B4-8	BE	BE	BE		BE	BE	BE		BE		1	
199-B5-1	S	A	A		S	A	A		S		1, 7	
199-B5-2	A				A		A		A		1	
199-B5-5	A				A				A	A	1	Lower portion unconfined aquifer
199-B5-8	BE	BE	BE	BE	BE	BE		BE	BE	BE	1	

Table 2. Groundwater Sampling Matrix for the 100-BC-5 Operable Unit (3 sheets). [complete revision]

Well	Field Parameters	Alkalinity	Anions <sup>a</sup>	Gross Alpha/Beta	Hexavalent Chromium <sup>b</sup>	Metals <sup>b,c</sup>	Strontium-90	Technetium-99	Tritium	Volatile Organics <sup>d</sup>	Month(s) Scheduled <sup>e</sup>	Screened Zone (top of unconfined unless otherwise noted)
199-B8-6	A	BO	BO	BO	A	BO			BO		1	
199-B8-9	Q			A	Q				Q		1, 4, 7, 10	
199-B9-2	BE			BE	BE				BE		1	
199-B9-3	BO	BO	BO	BO	BO	BO			BO		1	
699-63-90	BE	BE	BE	BE		BE			BE		1	
699-65-83	BE								BE		1	
699-67-86	BO								BO		1	
699-68-105	BO	BO	BO			BO			BO		1	
699-71-77	BO	BO	BO			BO		BO	BO		1	
699-72-73	BE	BE	BE			BE		BE	BE		1	
699-72-92	BO	BO	BO			BO			BO		1	
<b>Springs</b>												
037-1	A			A	A				A		10	N/A
039-2	A			A	A				A		10	N/A

Table 2. Groundwater Sampling Matrix for the 100-BC-5 Operable Unit (3 sheets). [complete revision]

Well	Field Parameters	Alkalinity	Anions <sup>a</sup>	Gross Alpha/Beta	Hexavalent Chromium <sup>b</sup>	Metals <sup>b,c</sup>	Strontium-90	Technetium-99	Tritium	Volatile Organics <sup>d</sup>	Month(s) Scheduled <sup>f</sup>	Screened Zone (top of unconfined unless otherwise noted)
<p>A = annual; BO = biennially in odd fiscal year; BE = biennially in even fiscal year; Q = quarterly; S = semiannually</p> <p>N/A = Not applicable</p> <p><sup>a</sup> Anions include but not limited to chloride, nitrate, and sulfate</p> <p><sup>b</sup> Filtered and unfiltered samples</p> <p><sup>c</sup> Metals include but not limited to calcium, chromium, potassium, magnesium, and sodium</p> <p><sup>d</sup> Volatile organic compounds include but not limited to chloroform and trichloroethene</p> <p><sup>f</sup> Sample dates may change based on staff availability, maintenance needs, and other factors. The goal is to conduct the annual sampling event in a single month and avoid high river stage.</p> <p><sup>g</sup> Monthly sampling may be reduced to quarterly if contaminant concentrations stabilize</p>												

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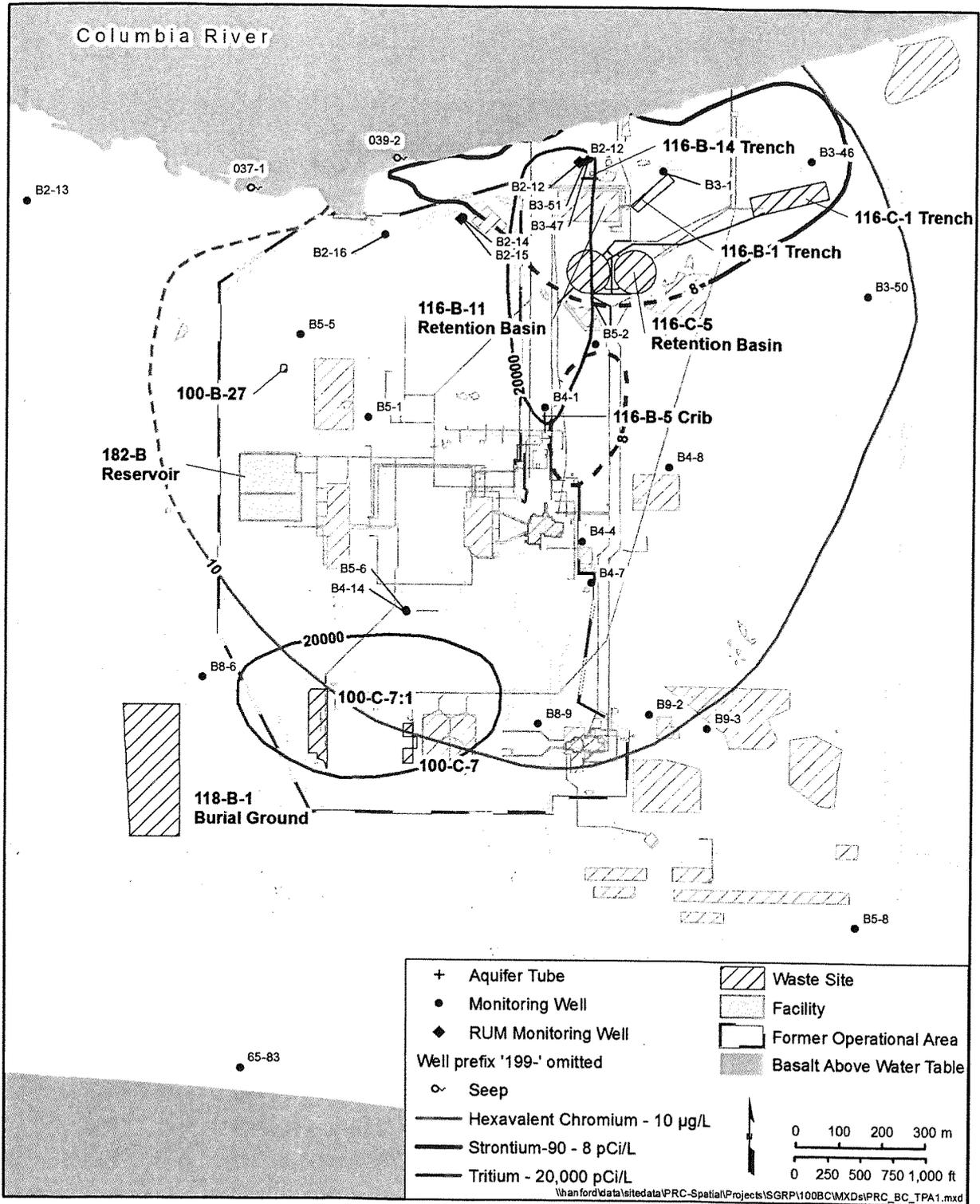


Figure 2. 100-BC-5 Groundwater Monitoring Wells and 2011 Contaminant Plumes

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Table A-1. Changes to 100-B-C-5 Operable Unit Groundwater Monitoring Program and Rationale for Monitoring [TPA-CN-240]

Well	Alkalinity	Anions	Alpha and Beta	Hexavalent Chromium	Metals	Strontium 90	Tritium	Technetium 99	Changes from Previous Monitoring Program (TPA-CN-182)	Rationale
199-B2-12	BO	BO	*	BO	BO	BO	BO	*	Delete alpha and beta(a)	Deep well paired with 199-B3-47
199-B2-13	BE	BE	*	BE	BE	BE	BE	*	Change Cr-6 and field parameters to BE; Delete alpha and beta(a)	Upstream; local background; Cr consistently <20 ug/L since 2004.
199-B3-1	BE	BE	*	A	BE	A	A	*	None.	Monitors 116-B-1 trench. Near river. Sr >DWS. Cr <20 ug/L. NO3 >DWS 1997-1998. Tritium spike 1998
199-B3-46	BO	BO	*	A	BO	A	A	*	None.	116-C-1 trench. Near river. Sr >DWS. Cr <20 ug/L
199-B3-47	BE	BE	*	A	BE	A	A	*	Delete alpha and beta(a)	Monitors 116-B-11 retention basin. Near river. Sr >DWS. Tritium variable and sometimes >DWS. Cr <20 ug/L. NO3 elevated but <DWS.
199-B4-1	BE	BE	*	A	BE	BE	A	*	Change Cr-6, tritium, and field parameters from BE to A. Delete alpha and beta(a)	Monitors 116-B-5 crib. Cr >20 ug/L. Sr >DWS. Tritium variable, sometimes >DWS.
199-B4-4	*	*	*	*	*	BE	BE	*	Delete alpha and beta(a)	Sr >DWS. Tritium <DWS.
199-B4-7	BO	BO	*	BO	BO	BO	BO	*	Delete alpha and beta(a)	Cr sometimes >20 ug/L. Sr >DWS. Tritium <DWS (bounds plume)
199-B4-8	BE	BE	*	BE	BE	BE	BE	*	Change Cr-6 and field parameters to BE. Delete alpha and beta(a)	Cr sometimes >20 ug/L. Sr >DWS. Tritium <DWS (bounds plume)
199-B5-1	BE	BE	*	A	BE	BE	A	*	Delete alpha and beta(a)	Cr and tritium variable, formerly >DWS. Sr >DWS. Tritium <DWS. Only well in west-central 100-B.
199-B5-2	*	*	*	A	*	BO	A	*	Delete alpha and beta(a)	Cr >20 ug/L and increasing; Sr >DWS; tritium variable, sometimes >DWS
199-B8-6	BO	BO	BO	A	BO	BO	A	*	Change Cr-6 from biennial to annual.	Monitors 118-B-1 burial ground. Tritium >DWS. Cr <20 ug/L. Only well near the burial ground.
199-B8-7	Q	Q	Q	Q	Q	*	Q	*	None.	Monitors 100-C-7 waste site. Tritium >DWS, Cr <20 ug/L. Relatively new well; will be decommissioned when waste site remediated.
199-B8-8	Q	Q	Q	M	Q	*	Q	*	Change Cr-6 from quarterly to monthly.	Monitors 100-C-7 waste site. Tritium >DWS. Relatively new well; will be decommissioned when waste site remediated. Cr-6 increase >20 ug/L 2008.
199-B9-2	*	*	BE	BE	*	*	BE	*	Add Cr-6; delete Sr-90.	Monitors waste sites in SE 100-B. Sr >DWS. Tritium <DWS. beta sufficient.
199-B9-3	BO	BO	BO	BO	BO	*	BO	*	Add alpha/beta; delete Sr-90.	Monitors waste sites in SE 100-B. Cr <20 ug/L; Sr >DWS

Well	Alkalinity	Anions	Alpha and Beta	Hexavalent Chromium	Metals	Strontium 90	Tritium	Technetium 99	Changes from Previous Monitoring Program (TPA-CN-182)	Rationale
699-63-90	BE	BE	*	*	BE		BE	*	Delete alpha and beta(a)	undetected; tritium and nitrate low. General chemistry; Between Umtanum Ridge and Gable Butte General chemistry and tritium only.
699-65-72	*	*	*	*	*	*	*	*	Delete well.	SE of 100-B. NO3 low; tritium undetected past 10 years. Other wells monitor inflow of 200. East better.
699-65-83	*	*	*	*	*	*	BE	*	None.	South of 100-B. Not needed to monitor plumes or regional chemistry.
699-66-103	*	*	*	*	*	*	*	*	Delete well.	Was monitored only for tritium (undetected). Not needed. Redundant with well 699-68-105.
699-67-86	*	*	*	*	*	*	BO	*	None.	SW of 100-B. Helps bound tritium plume (low to undetected).
699-68-105	BO	BO	*	*	BO	*	BO		None.	Farthest upgradient well. Background chemistry.
699-71-77	BO	BO	*	*	BO	*	BO	BO	None.	Just east of 100-B. Monitor for influence of 200 Areas plume, general chemistry.
699-72-73	BE	BE	*	*	BE	*	BE	BE	Change from annual biennial.	Monitors 200 Areas plume east of 100-B. Tritium once >DWS. Stable trends.
699-72-92	BO	BO	*	*	BO	*	BO	*	None.	West of 100-B. NO3 once->DWS, source unknown.
Aquifer Tubes	*	*	*	*	*	*	*	*	Defer to aquifer tube SAP.	Eliminate overlap between decennials.
Spring 037-1	*	*	A	A	*	*	A	*	Add hexavalent Cr.	Focus on contaminants of concern or screening parameters.
Spring 039-2	*	*	A	A	*	*	A	*	Add hexavalent Cr.	Focus on contaminants of concern or screening parameters.

(a) Rationale for deleting alpha and beta gross alpha in these wells is at background levels. Gross beta reflects presence of Sr-90 and/or low levels of Tc-99, which are analyzed separately. Retain alpha and beta as indicators in wells near waste sites where groundwater is not as well characterized (southern 100-B/C Area).

A \_\_\_\_\_ = annually  
 BE \_\_\_\_\_ = biennially in even fiscal years (e.g., FY08)  
 BO \_\_\_\_\_ = biennially in odd fiscal years (e.g., FY09)  
 DWS \_\_\_\_\_ = drinking water standard

M \_\_\_\_\_ = monthly  
 Q \_\_\_\_\_ = quarterly  
 SAP \_\_\_\_\_ = sampling and analysis plan  
 \* \_\_\_\_\_ = not analyzed

Table A.1. Changes to 100-BC-5 Operable Unit Groundwater Monitoring Program and Rationale for Monitoring (5 sheets)

Well	TPA-CN-293 Frequency	Frequency Fiscal Year 2012	New Sample Frequency									Monitoring Rationale and Comments
			Field Parameters	Alkalinity	Anions	Gross Alpha/Beta	Hexavalent Chromium	Metals <sup>b,c</sup>	Sr-90	Technetium-99	Tritium	
<b>Clustered Wells</b>												
199-B2-12	BO	BO	BO	BO	BO		BO	BO	BO		BO	Ringold upper mud. COCs near or below detection limits.
199-B3-47	A	Q	A	BE	BE		A	BE	A		A	In FY 2012 temporarily increased frequency to match adjacent, new, deep well 199-B3-51. This well typically has highest chromium concentrations, but they are consistent. Sr-90 and tritium >DWS. Nitrate >DWS 1999.
199-B3-51	None	Q	BO	BO	BO		BO	BO	BO		BO	Monitors base of unconfined aquifer. COCs near or below detection limits. Monitor at same frequency as adjacent Ringold upper mud well.
199-B2-14	None	A	A				A		A		A	Helps define plumes near river: Chromium 20 to 30 µg/L; Sr-90 near or below DWS. Tritium below DWS.
199-B2-15	None	Q	BE				BE		BE		BE	Ringold upper mud. COCs near or below detection limits.
199-B4-14	None	Q/M	M	A	A	A	M	A			M <sup>g</sup>	Downgradient of 100-C-7:1 waste site; sudden chromium increase in February 2012. Increased frequency from quarterly to monthly. Re-evaluate frequency later.

Table A.1. Changes to 100-BC-5 Operable Unit Groundwater Monitoring Program and Rationale for Monitoring (5 sheets)

Well	TPA-CN-293 Frequency	Frequency Fiscal Year 2012	New Sample Frequency									Monitoring Rationale and Comments	
			Field Parameters	Alkalinity	Anions	Gross Alpha/Beta	Hexavalent Chromium	Metals <sup>b,c</sup>	Sr-90	Technetium-99	Tritium		Volatile Organics
199-B5-6	None	Q/ M	M	A	A	A	M	A			M <sup>g</sup>	A	Downgradient of 100-C-7:1 waste site; monitors lower part of unconfined aquifer adjacent to 199-B4-14. Increased frequency to be same as 199-B4-14. Re-evaluate frequency later. TCE detections.
<b>Single Wells</b>													
199-B2-13	BE	BE	BE	BE	BE		BE	BE			BE		Upstream; local background. Delimits chromium plume on west side.
199-B2-16	None	Q	S	A	A		S	A	S		S	A	Lower portion unconfined aquifer. Chromium concentrations 20 to 30 µg/L. Wells upgradient of this one had chromium spikes in 2012 so semiannual is warranted rather than annual. Tritium and Sr-90 <DWS. TCE detections.
199-B3-1	A	A	A	BE	BE		A	BE	A		A		Monitors 116-B-1 trench. Chromium 20 to 30 µg/L and possibly increasing. Sr-90 >DWS. Tritium currently <DWS (spiked 1998). Nitrate >DWS 1997-98.
199-B3-46	A	A	A	BO	BO		A	BO	A		A		Monitors 116-C-1 trench. Sr-90 >DWS. Chromium ~15 µg/L. Tritium <DWS.
199-B3-50	None	A	A				A		A		A		Monitors eastern 100-BC Area. Chromium 10 to 15 µg/L. Sr-90 undetected. Tritium <DWS.
199-B4-1	A	A	A	BE	BE		A	BE	A		A		Monitors 116-B-5 crib. Chromium 30 to 40 µg/L. Sr-90 >DWS. Tritium variable above and below DWS.

Table A.1. Changes to 100-BC-5 Operable Unit Groundwater Monitoring Program and Rationale for Monitoring (5 sheets)

Well	TPA-CN-293 Frequency	Frequency Fiscal Year 2012	New Sample Frequency										Monitoring Rationale and Comments
			Field Parameters	Alkalinity	Anions	Gross Alpha/Beta	Hexavalent Chromium	Metals <sup>b,c</sup>	Sr-90	Technetium-99	Tritium	Volatile Organics	
199-B4-4	BE	BE	BE				BE		BE		BE		Monitors near B Reactor waste sites. Chromium 20 to 30 µg/L. Sr-90 >DWS. Tritium <DWS but increasing 2006-2012. Near other wells.
199-B4-7	BO	BE	S	A	A		S	A	A		S		Monitor farther downgradient from 100-C-7 waste sites; increase frequency to watch for 199-B4-14 chromium spike arrival. Sr-90 and tritium <DWS.
199-B4-8	BE	BE	BE	BE	BE		BE	BE	BE		BE		Chromium 20 to 30 µg/L. Delimits Sr-90 plume on east. Tritium <DWS but increasing 2006-2012.
199-B5-1	A	A	S	A	A		S	A	A		S		Chromium decreased sharply in 2012. Increase frequency to monitor changes and watch for arrival of 199-B4-14 chromium spike. Sr-90 near or below DWS. Tritium <DWS since 2002.
199-B5-2	A	A	A				A		A		A		Chromium 20 to 35 µg/L. Sr-90 >DWS. Tritium variable and often >DWS.
199-B5-5	None	A	A				A				A	A	Lower portion unconfined aquifer. Monitors 100-B-27 waste site. Chromium 30 to 35 µg/L. Sr-90 undetected. Tritium <DWS. TCE detections.
199-B5-8	None	Q	BE	BE	BE	BE	BE	BE		BE	BE	BE	Upgradient, southeast of 100-BC Area. Chromium near 10 µg/L. Sr-90 undetected and tritium <1000 pCi/L. TCE detections.
199-B8-6	None	A	A	BO	BO	BO	A	BO			BO		Monitors 118-B-1 burial ground, southwestern 100-BC Area. Tritium formerly >DWS. Chromium has declined to <10 µg/L. Sr-90 undetected.

Table A.1. Changes to 100-BC-5 Operable Unit Groundwater Monitoring Program and Rationale for Monitoring (5 sheets)

Well	TPA-CN-293 Frequency	Frequency Fiscal Year 2012	New Sample Frequency										Monitoring Rationale and Comments	
			Field Parameters	Alkalinity	Anions	Gross Alpha/Beta	Hexavalent Chromium	Metals <sup>a,c</sup>	Sr-90	Technetium-99	Tritium	Volatile Organics		
199-B8-7	Q	None												Decommissioned
199-B8-8	Q	None												Decommissioned
199-B8-9	None	Q	Q			A	Q					Q		Near C Reactor, east of the 100-C-7 waste sites. Chromium temporarily peaked in summer 2011, possibly related to waste site remediation. Tritium increased to >DWS. Keep quarterly during remediation.
199-B9-2	BE	BE	BE			BE	BE					BE		Monitors southeastern 100-BC Area. Chromium >10 µg/L. Sr-90 near or below detection limits. Tritium well below DWS but increased 2012. Near 199-B9-3.
199-B9-3	BO	BO	BO	BO	BO	BO	BO	BO				BO		Monitors southeastern 100-BC Area. Chromium 10 to 20 µg/L. Sr-90 below detection limits. Tritium well below DWS. Near 199-B9-2.
699-63-90	BE	BE	BE	BE	BE	BE		BE				BE		Between Umtanum Ridge and Gable Butte. COCs below detection limits. Monitor for regional chemistry.
699-65-83	BE	BE	BE									BE		South of 100-BC Area. Chromium <10 µg/L. Sr-90 <detection limits. Tritium near detection limits. Monitor for regional chemistry.
699-67-86	BO	BO	BO									BO		Southwest of 100-BC Area. Chromium <10 µg/L. Sr-90 and tritium below detection limits. Monitor for regional chemistry.

Table A.1. Changes to 100-BC-5 Operable Unit Groundwater Monitoring Program and Rationale for Monitoring (5 sheets)

Well	TPA-CN-293 Frequency	Frequency Fiscal Year 2012	New Sample Frequency										Monitoring Rationale and Comments
			Field Parameters	Alkalinity	Anions	Gross Alpha/Beta	Hexavalent Chromium	Metals <sup>b,c</sup>	Sr-90	Tc-99	Tritium	Volatile Organics	
699-68-105	BO	BO	BO	BO	BO			BO			BO		Upstream of 100-BC Area. Background chemistry.
699-71-77	BO	BO	BO	BO	BO			BO		BO	BO		East of 100-BC Area. Chromium <10 µg/L. Sr-90 <detection limits. Tritium near detection limits.
699-72-73	BE	BE	BE	BE	BE			BE		BE	BE		Monitors 200 Areas plumes coming through Gable Gap. Tritium formerly >DWS but has declined. Detectable Tc-99.
699-72-92	BO	BO	BO	BO	BO			BO			BO		West of 100-BC Area. COCs near or below detection limits. Monitor for regional chemistry.
<b>Riverbank Seeps</b>													
037-1	A	A	A			A	A				A		Monitor natural groundwater discharge.
039-2	A	A	A			A	A				A		Monitor natural groundwater discharge.
A = annually BE = biennially in even-numbered fiscal years BO = biennially in odd-numbered fiscal years COC = contaminant of concern DWS = drinking water standard Q = quarterly S = semiannually													

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Table B.1 (addendum). Construction Information for 100-BC-5 Monitoring Wells.

Well ID	Well	Year Drilled	Casing <sup>(a)</sup>	Screen <sup>(b)</sup>	Unit <sup>(c)</sup>	Open Interval Elevation, m		Water Level Elev., m	Water Level Date	Water Column, m <sup>(d)</sup>
						Top	Bottom			
C7665	199-B2-14	2010	SS	S	TU	121.5	113.9	119.62	4/18/2010	5.7
C7783	199-B2-15	2011	SS	S	CR	86.0	82.9	119.15	11/12/2010	36.3
C7784	199-B2-16	2011	SS	S	LU	99.2	88.5	120.10	8/26/2010	31.6
C7506	199-B3-50	2010	SS	S	TU	121.9	115.8	120.55	4/18/2010	4.7
C7785	199-B3-51	2011	SS	S	LU	91.7	88.6	121.50	2/15/2011	32.9
C7786	199-B4-14	2010	SS	S	TU	123.0	116.9	121.74	7/20/2010	4.8
C7505	199-B5-5	2010	SS	S	LU	99.1	79.3	120.30	4/13/2010	41.0
C7507	199-B5-6	2010	SS	S	LU	94.7	87.1	121.08	4/13/2010	34.0
C8244	199-B5-8	2011	SS	S	TU	123.1	117.0	121.77	3/2/2011	4.7
C7508	199-B8-9	2010	SS	S	TU	123.5	117.4	121.97	8/23/2009	4.5

a) Casing material: SS = stainless steel  
b) Open interval type: S = screen  
c) Hydrogeologic unit monitored: TU = top of unconfined aquifer; CR = confined Ringold (water-bearing zone in Ringold upper mud unit); LU = lower unconfined aquifer (lower portion of Ringold unit E)  
d) Thickness of water column in well (water-level minus bottom of open interval)

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