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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
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March 18, 2011 11-NWP-012

Mr. Mark S. French, Program Manager
Richland Operations Office
United States Department of Energy
P.O. Box 550, MSIN: A3-04
Richland, Washington 99352

Re: Transmittal of the Signed Waste Site Reclassification Form (WSRF) for the 100-H-41 Remaining Sites Verification Package (RSVP), Department of Ecology (Ecology) comments on the RSVP for 100-H-41, and Documentation of Ecology's Comparison of Site Data with Washington Administrative Code (WAC) 173-340 (2007) Requirements

Reference: Letter dated August 30, 2010 from J. A. Hedges, Ecology, to J. Franco, USDOE, "116-DR-8 Seal Pit Crib Waste Site Reclassification Form (WSRF)"

Dear Mr. French:

Enclosed is the signed TPA-MP-14 WSRF (enclosure 1) for the 100-H-41, 100 H Contaminated Area Waste Site, for interim reclassification to "Interim Closed Out." Ecology's approval of this interim reclassification is based on the requirements for waste site reclassification identified in the *Remedial Design Report/Remedial Action Work Plan for the 100-Area,* DOE/RL-96-17, Revision 6, which identifies WAC 173-340 (1996) cleanup levels. Ecology signed the WSRF because the requirements for interim reclassification have been met; however, we do not necessarily agree with the details in the supporting documentation, as all of our comments (enclosure 2) on the RSVP have not been resolved to our satisfaction. Under the Hanford Federal Facility Agreement and Consent Order, we are not required to resolve comments on secondary documents.

In anticipation of the final Record of Decision (ROD) for the 100-H Area, we now evaluate data for consistency with corrective action requirements that will be updated within the final ROD. Therefore, we compared the data in the RSVP for 100-H-41 against WAC 173-340 (2007) requirements (enclosure 3).

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Based on this evaluation, it was determined that there are exceedances of WAC 173-340 (1996) cleanup levels (per DOE/RL-96-22, Revision 6) and WAC 173-340 (2007) Method B cleanup levels (modified for hexavalent chromium) at specific locations where sampling occurred (see enclosures 2 and 3). Therefore, Ecology believes additional investigation of the remediation will be required under the final ROD. As a result, we request a delay of backfill at this waste site, similar to that requested for the 116-DR-8 waste site (reference).

If there are any questions, please contact me at 509-372-7941.

Sincerely,

Nina M. Menard

Nina M. Menard
Environmental Restoration Project Manager
Nuclear Waste Program

mj/aa
Enclosures (3)

cc w/enc:
Dennis Faulk, EPA
Joanne Chance, USDOE
John Neath, USDOE
Megan Proctor, WCH
Stuart Harris, CTUIR
Gabriel Bohnee, NPT
Russell Jim, YN
Susan Leckband, HAB
Ken Niles, ODOE
Administrative Record: 100-H Area
Environmental Portal
Hanford Operating Record General File
USDOE-RL Correspondence Control

Date Submitted: 8/3/10 Originator: M. L. Proctor Phone: 372-9227	**WASTE SITE RECLASSIFICATION FORM** Operable Unit(s): 100-HR-1 Waste Site Code: 100-H-41 Type of Reclassification Action: Closed Out ☐ Interim Closed Out ☒ No Action ☐ RCRA Postclosure ☐ Rejected ☐ Consolidated ☐	Control Number: 2010-003

This form documents agreement among parties listed authorizing classification of the subject unit as Closed Out, Interim Closed Out, No Action, RCRA Postclosure, Rejected, or Consolidated. This form also authorizes backfill of the waste management unit, if appropriate, for Closed Out and Interim Closed Out units. Final removal from the NPL of No Action and Closed Out waste management units will occur at a future date.

Description of current waste site condition:
The 100-H-41, 100-H Contamination Area waste site is located in the 100-HR-1 Operable Unit at Washington State Plane coordinates N 152652.9, E 577883.1. A 35.6-cm (14-in.)-diameter, vertically oriented, concrete pipe was located in a posted radiological Contamination Area. Excavation of the site for confirmatory sampling purposes identified radioactively contaminated mud dauber nests located on the inside of the pipe. Because this contamination was found to be due to the presence of mud dauber nests, the contaminated 100-H-41 pipe and associated soil were removed and disposed at the Environmental Restoration Disposal Facility as part of the 100-H-37, 100-H Mud Dauber Contamination Area remediation activities. The 100-H-37 site consisted of dispersed radiological contamination caused by mud dauber activities, including mud dauber nests similar to those found inside the 100-H-41 vertical pipe. After the pipe and soil were removed due to the mud dauber contamination, a confirmatory soil sample and duplicate soil sample were collected at the base of the 100-H-41 excavation. The sample results do not indicate the presence of any environmental contamination.

Confirmatory sampling and comparison of residual contaminant concentrations against cleanup levels have been performed in accordance with remedial action objectives and goals established by the *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington* (Remaining Sites ROD), U.S. Environmental Protection Agency, Region 10, Seattle, Washington. The selected action involved: (1) evaluating the site using available process information, (2) demonstrating through confirmatory sampling that cleanup goals have been achieved, and (3) proposing the site for reclassification to Interim Closed Out. The 100-H-41 waste site was included in the *Explanation of Significant Differences for the 100 Area Remaining Sites Interim Remedial Action Record of Decision, Hanford Site, Benton County, Washington,* U.S. Environmental Protection Agency, Region 10, Seattle, Washington as a candidate site for confirmatory sampling.

Basis for reclassification:
Evaluation of confirmatory sampling data for the 100-H-41 waste site demonstrates that this site meets the remedial action objectives specified in the Remaining Sites ROD. This site will support future unrestricted land uses that can be represented (or bounded) by a rural-residential scenario. Sampling results also showed that this site will support unrestricted future use of shallow zone soil (i.e., surface to 4.6 m [15 ft]) and is protective of groundwater and the Columbia River. Site contamination does not extend into the deep zone; therefore, institutional controls to prevent uncontrolled drilling or excavation into the deep zone are not required. In accordance with this evaluation, the confirmatory sampling results support a reclassification of this site to Interim Closed Out. The basis for reclassification is described in detail in the *Remaining Sites Verification Package for the 100-H-41, 100-H Contaminated Area Waste Site* (attached).

Regulator Comments:
Approval of this WSRF documents regulator agreement that 100-H-41 waste site qualifies for "Interim Closed Out" under this Interim Action ROD. In addition, Ecology has evaluated the data for this site against WAC 173-340 (2007) clean-up levels for direct contact, groundwater protection, and river protection. This evaluation is documented in the letter transmitting Ecology's conditional approval of the site's interim reclassification to "Interim Closed Out."

Waste Site Controls:
Engineered Controls: Yes ☐ No ☒ Institutional Controls: Yes ☐ No ☒ O&M requirements: Yes ☐ No ☒
If any of the Waste Site Controls are checked Yes specify control requirements including reference to the Record of Decision, TSD Closure Letter, or other relevant documents.

M. S. French DOE Federal Project Director (printed)	Signature	2/9/11 Date
N. Menard Ecology Project Manager (printed)	Signature	3/15/11 Date
NA EPA Project Manager (printed)	Signature	Date

Enclosure 2

Ecology Document Review

Remaining Site Verification Package for the 100-H-41, 100-H Contaminated Area Waste Site

Reviewers: Noe'l Smith-Jackson, Beth Rochette, Mandy Jones
Date: September 16, 2010
Washington Closure Hanford (WCH) Response: September 28, 2010
Ecology (ECY) Response: November 16, 2010
WCH Response Date: December 2, 2010

General Comments:

1. It appears that the asphalt material that may be contributing to the PAH contamination will be removed with the RTD of 100-H-28:2, 100-H-28:5, and 100-H-28:7 (Ecology has requested RTD of this site). Please remove the following sentence, "Concentrations of PAH are associated with cross-contamination from asphalt material present at the site and do not require further evaluation." Remove the above sentence throughout the WSRF and the document and replace it with text that describes that all of the asphalt material will be removed with upcoming RTDs and the base of these excavations will be sampled for PAHs (and other associated COCs), to confirm that the remediation has removed the associated contamination.

   WCH Response: According to WAC 173-303-071(3)(e), asphalt is excluded as a dangerous waste material. See February 26, 2004 UMM discussing eliminating PAHs as COCs for sites where the PAHs are associated with asphalt material. Visual observations during excavation and confirmatory sample results verify the PAH detections to be from asphalt and not 100-H-41 waste site contamination. Asphalt does not require removal under CERCLA. The suggested text "that all of the asphalt material will be removed" will not be included in the document.

   Ecology Response: The February 26, 2004 UMM agreement with EPA was specific to one particular waste site in the 100 B/C area and therefore not applicable to all waste sites throughout Hanford. Ecology disagrees with the text as written and we will include all sample data in our evaluation letter that is filed in the administrative record.

   WCH Response: Noted

2. Please add the above mentioned text to the design for 100-H-28:2. On 11/2/2009 via e-mail, Ecology stated, "Approval of the designs for 100-H-28:2 and 100-H-28:3 will follow resolution of issues regarding the disposition of wells located in the excavation layback. Ecology must be consulted regarding the disposition of these wells and the path forward for the pipelines in these locations." Once issues of well disposition have been addressed we will document the need to remove the asphalt material and sample the base of the excavation for all of the necessary COCs, within the design for 100-H-28:2.

   WCH Response: See response to general comment #1.

Ecology Response: Please provide us a status of the designs for 100-H-28:2 and 100-H-28:3, as stated above it was agreed on 11/2/2009 that Ecology must be consulted regarding the disposition of these wells and the path forward for the pipelines in these locations.

WCH Response: The disposition of the wells and associated segments of adjacent piping has not been determined.

3. This waste site should be documented as Interim Closed Out on the WSRF and within the text of the document, as the concrete structure that was removed under 100-H-37 was considered part of the 100-H-41 waste site (see WIDS and SIS Reports). Additionally, update the WIDS summary report for 100-H-41 to clearly document that the concrete pipe and associated soil were removed and disposed at the ERDF as part of the 100-H-37 remediation activities.

   WCH Response: Accept

   Ecology Response: Please review the entire document and make the necessary changes. It appears that the check box has been moved from No Action to Interim closed, but the text of the WSRF and the document still read No Action in many places.

   WCH Response: Corrections have been made throughout document and WSRF to change to "Interim Closed Out."

4. Please provide the electronic version of the WSRF to Ecology for addition of the Regulator Comments.

   WCH Response: Accept

   Ecology Response: Accept, received

Specific Comments:

1. **Waste Site Reclassification Form, Description of Current Waste Site Condition**: The form states that because the contamination was found to be due to the presence of mud dauber nests, the contaminated pipe and associated soil were removed and disposed at the ERDF as part of the 100-H-37 remediation activities. Please explain the correlation between the remediation of the 100-H-37 waste site and the cleanup of this 100-H-41 waste site, within the WSRF.

   WCH Response: Accept

   Ecology Response: Accept

2. **Page ES-1, 5th paragraph, 3rd sentence**: Please change this sentence to read, "The results of the confirmatory sampling are used to make reclassification decisions for the 100-H-41 waste site..."

   WCH Response: Accept

   Ecology Response: Accept

3. **Page ES-2, Table ES-1. Summary of Remedial Action Goals for the 100-H-41 Waste Site, footnotes "a" and "f" and various places throughout the RSVP**: Both footnotes state that the PAH contamination is due to cross-contamination in the sample from asphalt material. Please provide information detailing how it has been confirmed that all of the PAH contamination is attributable to the asphalt and not the actual site soil.

   WCH Response: As documented in the sampler's field logbook, a cement and asphalt pad was observed protecting an underlying 30-in pipeline. This pipeline is most likely the 30-in reinforced concrete pipeline identified as 128-H-28:2. Additionally, a comparison of the PAH results for the confirmatory soil samples against the results of a known asphalt sample (see February 26, 2004 UMM) show a good correlation.

   Ecology Response: Comment closed. As stated previously, the 2004 UMM agreement was specific to a waste site in the 100 B/C Area and Ecology will make note of our concerns in our evaluation letter that is sent to the administrative record.

   WCH Response: Noted

4. **Page ES-3, last sentence of page, and page 1, last sentence of Statement of Protectiveness**: The text states "Concentrations of PAH are associated with cross-contamination from asphalt material present at the site and do not require further evaluation." Please delete this statement. If asphalt debris is contaminating the soil, the contaminated soil should be removed.

   WCH Response: See response to general comment #1. No change will be made.

   Ecology Response: Comment closed. We will document the PAH exceedances in our evaluation letter that is sent to the administrative record.

   WCH Response: Noted

5. **Page 4, Geophysical Investigation, 4th sentence**: Please provide details on the status of this pipeline. Are there plans to remediate the pipeline? This document needs to state the association of this pipeline (at 4.3 ft depth) and 100-H-41. Additionally, if there is an association of the pipeline at 4.3 ft depth and any other pipelines in this area please document here.

WCH Response: The geophysical survey suspected a pipeline to be present at a depth of 4.3 ft. Using geophysical techniques, this depth was an estimate. During confirmatory sampling, two pipelines (100-H-35 and 100-H-28:2) were located and one of these may be the pipeline identified by the geophysical survey. Field observations during confirmatory sampling noted that neither of these pipelines were connected or associated with 100-H-41. Confirmatory sampling of the 100-H-35 pipeline is planned for this fall. A new figure showing the locations of all these pipelines will be added to the RSVP.

Ecology Response: Accept

6. **Page 5, Figure 4**: Please indicate the boundaries of the 100-H-37 site on this figure or include another figure showing the relationship between 100-H-37 and 100-H-41.

   WCH Response: Accept. A new figure will be included showing the relationship of 100-H-37 and 100-H-41.

   Ecology Response: Accept

7. **Page 6**: Please include the map that was provided by Wendy Thompson on 9/7/10. It will help clearly define the locations and potential interactions of all existing pipelines in the area of 100-H-41.

   WCH Response: Accept

   Ecology Response: Accept

8. **Page 9, Contaminants of Potential Concern**: Add gross alpha and gross beta to this text to be consistent with Table 1.

   WCH Response: Accept

   Ecology Response: Accept

9. **Page 9, Confirmatory Sample Design, 2nd paragraph, 7th sentence**: Please clearly identify within the text which pipeline is the 20 inch pipeline and which is the 30 inch pipeline (i.e., A 20 inch pipeline was encountered this 20 inch pipeline is 100-H-35)

   WCH Response: Accept

   Ecology Response: Accept

10. **Page 9, Confirmatory Sample Design, 2nd paragraph, last sentence**: Please identify 100-H-35 and 100-H-28 on Figure 1. Additionally, please identify the specific sub-site of 100-H-28.

    WCH Response: A new figure will be included to show these pipelines and will be referenced here instead of Figure 1.

Ecology Response: Accept

11. **Page 12, Table 3. Comparison of Maximum Values to Action Levels for the 100-H-41 Test Pit Confirmation Samples**: Replace "Carbozole" with "Carbazole". Also, footnote "f" has been applied to carbazole. However, this constituent is not analyzed per the PAH method 8310. The constituent has also been categorized with semivolatiles instead of PAH's in attached calculation brief 0100-H-CA-V0135.

    WCH Response: Accept. Clarification will be added to footnote f that in addition to PAHs, carbazole is also found in asphalt.

    Ecology Response: Accept

12. **Page 13, Confirmatory Sample Data Evaluation**: The text indicates that the PAH detections in the soils were due to the presence of asphalt material. This may be true. However, there are PAHs in the soil, and in some cases they exceed levels of concern. The contaminated soil should be removed, and samples should be taken to show that the contamination has been removed. The asphaltic material is now part of the soil and therefore, is part of the site.

    WCH Response: See comment #1. The contamination is due to pieces of asphalt in the sample media. The soil does not require remediation due to asphalt being incorporated into the sample media.

    Ecology Response: Comment closed. We will document the PAH exceedances in our evaluation letter that is sent to the administrative record.

    WCH Response: Noted

13. **Page 13, Confirmatory Sample Data Evaluation, and p. A-6, Table 1**: The risk calculation brief shows that the direct contact cancer risk from benzo(a)pyrene is 7.1E-06, exceeding the individual risk goal of 1E-06. Please modify the text in the second paragraph of the Confirmatory Sample Data Evaluation section as follows: "All individual carcinogenic risks were less than 1×10^{-6}, with the exception of benzo(a)pyrene. As noted, this PAH constituent is associated with asphaltic material. ~~and therefore is not a site contaminant.~~ The asphaltic material is part of the site, and the exceedance of the risk goal is justification for additional cleanup.

    WCH Response: See comment #1. No change will be made.

    Ecology Response: Comment closed. We will document the PAH exceedances in our evaluation letter that is sent to the administrative record.

    WCH Response: Noted

14. **Page 14, Confirmatory Sample Data Evaluation, 2nd paragraph**: On 9/14/2010 agreement was reached with DOE on application of the 3 part test and how it would be documented in CVPs and RSVPs. Please update this document accordingly. Make the necessary changes to the text and the Appendices.

WCH Response: Accept. A paragraph discussing application of the 3 part test to the focused sampling will be included. No change is needed to the calculation brief in Appendix A since this calculation is not a 95% UCL calculation brief.

Ecology Response: Accept

15. **Page 14, Summary for No Action**: Please change this section to read that this site is Interim Closed Out. See General Comment #3 for justification.

WCH Response: Accept

Ecology Response: It does not appear that this has been revised in the document; please update this section as appropriate.

WCH Response: The document has been updated as noted in response to general comment #3.

16. **Page A-6, Table 1**: The cumulative excess cancer risk does not include the risk associated with arsenic, which exceeds the site background and represents a direct contact as well as a soil to ground water risk of greater than 1E-05. The site risk goal of 1E-05 is exceeded as a result of both arsenic and PAH contamination.

WCH Response: The RDR/RAWP uses the Washington State background value of 20 mg/kg as the cleanup level. The maximum arsenic confirmatory sample result was 8.02 mg/kg, less than the cleanup criteria, and therefore not included in the cancer risk calculation. The final action RI/FS includes a task to determine the future cleanup level for arsenic.

Ecology Response: Ecology will make note of this in our evaluation letter that is sent to the administrative record.

WCH Response: Noted

17. **Page A-12, Attachment 1**: The arsenic concentrations for both of the soil samples exceed WAC 173-340 (2007) cleanup levels for direct contact, protection of groundwater and protection of surface water. They exceed a cancer risk of 1E-05 (note that the criteria for a single contaminant is 1E-06) and yield hazard quotients (based on WAC 173-340, 2007) greater than 1 for several target organs. Further cleanup for arsenic may be warranted.

WCH Response: See comment #16.

Ecology Response: Ecology will make note of this in our evaluation letter that is sent to the administrative record.

WCH Response: Noted

18. **Page A-12, Attachment 1**: Both of the samples exceed the WAC 173-340 Table 749-3 value for soil for protection of plants for boron by a factor of two or more. Ecology will make note of this for our records.

WCH Response: Noted

Ecology Response: Ecology will make note of this in our evaluation letter that is sent to the administrative record.

WCH Response: Noted

19. **Page A-13, Attachment 1**: The following contaminants exceed WAC 173-340 (2007) levels of concern:
    - benzo(a)anthracene – cancer risk greater than 1E-06 for protection of groundwater; exceeds soil default cleanup level for protection of groundwater and surface water
    - benzo(a)pyrene - cancer risk greater than 1E-06 for protection of groundwater, and direct contact; exceeds soil default cleanup level for protection of groundwater, surface water, and direct contact
    - benzo(b)fluoranthene - exceeds soil default cleanup level for protection of surface water
    - benzo(k)fluoranthene - exceeds soil default cleanup level for protection of surface water
    - Sum of PAHs - cancer risk greater than 1E-05 for protection of groundwater, and direct contact

WCH Response: Noted

Ecology Response: Ecology will make note of this in our evaluation letter that is sent to the administrative record.

WCH Response: Noted

20. **Page C-5, fourth paragraph**: Replace "benzo(B)fluoranthene with "benzo(b)fluoranthene".

WCH Response: Accept

Ecology Response: Accept

Enclosure 3

The Department of Ecology's Comparison of Supporting Data for the 100-H-41 with Washington Administrative Code (WAC) 173-340 (2007) Requirements

Overall summary: Washington Closure Hanford (WCH) and the United States Department of Energy (USDOE) made a determination that the Polycyclic Aromatic Hydrocarbons (PAH) and carbazole concentrations at this waste site are due to cross-contamination in the sample from asphaltic material. Ecology requested that additional remediation occur at this site in order to remove the soil that exceeds the cleanup levels. Based on 1996 cleanup levels, multiple contaminants exceed the Remedial Action Goals in the test pit. Additionally, the RESidual RADioactivity Model (RESRAD) has not been used on this sample data set. Many of these contaminants also exceed WAC 173-340 (2007) clean up levels. Additional evaluation of contaminants exceeding 1996 Clean up levels, 2007 Clean up levels and ecological risk screening values is necessary for final action.

Summary of Exceedances for the Test Pits (Yes = concentration exceeds cleanup/screening level)

Contaminant	WAC 173-340-740 (1996) Groundwater Protection	WAC 173-340-730 & -740 (1996) River Protection	RESRAD[a] (Kd, ml/g)	WAC 173-340, Table 749-3 Ecological Protection	WAC 173-340-730 & 740(7)(d or f) (2007)[b]	WAC 173-340-740(7)(e) Human Health (2007)[b]
Arsenic	No	No	--	**Yes**	**Yes* (dc, gw, sw)**	**Fail**
Boron	No	No	--	**Yes**	No	Pass
Benzo(a) anthracene	**Yes**	**Yes**	**Not performed**	No	**Yes (gw, sw)**	**Fail**
Benzo(a) pyrene	**Yes**	**Yes**	**Not performed**	No	**Yes (dc, gw, sw)**	**Fail**
Benzo(b) fluoranthene	**Yes**	**Yes**	**Not performed**	No	**Yes (sw)**	**Fail**
Benzo(k) fluoranthene	**Yes**	**Yes**	**Not performed**	No	**Yes (sw)**	**Fail**
Carbazole	**Yes**	No	**Not performed**	No	**Yes (gw)**	**Fail**
Chrysene	**Yes**	**Yes**	**Not performed**	No	No	Pass
Dibenz[a,h] anthracene	**Yes**	**Yes**	**Not performed**	No	No	Pass
Indeno(1,2,3 -cd) pyrene	**Yes**	**Yes**	**Not performed**	No	**Yes (sw)**	**Fail**

Note: This table does not include contaminants with soil concentrations below background or the practical quantitation limit (PQL). When soil concentrations are less than background or the PQL, cleanup levels default to background or the PQL. Ecology considers non-detected metals at half of their PQL.

a. WCH and USDOE decided not to include this data in the evaluation of this site therefore, RESRAD was not run.

b. The specific clean up level exceeded is denoted in parentheses (direct contact = dc, groundwater protection = gw, and surface water protection = sw)

*Final cleanup levels are currently being evaluated for arsenic in the 100 Area.

Outstanding Issues:

- State eco-risk screening levels exceeded for arsenic, boron, and vanadium (<background).

- Environmental Protection Agency (EPA) eco-risk screening levels exceeded for manganese (<background), vanadium (<background) and zinc (<background).

- Ecology disagrees with the following statement found in the Remaining Sites Verification Package: "Concentrations of PAH are associated with cross-contamination from asphaltic material present at the site and do not require further evaluation." Ecology requested that additional remediation occur at this location to remove the PAH contaminated soil.

- Arsenic represents a direct contact as well as a soil to groundwater risk of greater than 1E-05. The site risk goal of 1E-05 is exceeded as a result of both arsenic and PAH contamination.

- The arsenic concentrations for both of the soil samples exceed WAC 173-340 (2007) cleanup levels for direct contact, protection of groundwater and protection of surface water. They exceed a cancer risk of 1E-05 (note that the criteria for a single contaminant is 1E-06) and yield hazard quotients (based on WAC 173-340, 2007) greater than 1 for several target organs. Further cleanup for arsenic may be warranted.

- Both of the samples exceed the WAC 173-340 Table 749-3 value for soil for protection of plants for boron by a factor of two or more.

- The following are also areas for concern:
    - Benzo(a)anthracene – cancer risk greater than 1E-06 for protection of groundwater;
    - Benzo(a)pyrene – cancer risk greater than 1E-06 for protection of groundwater, and direct contact;
    - Sum of PAHs – cancer risk greater than 1E-05 for protection of groundwater, and direct contact.