File No. EA2020-129

CITY OF RICHLAND
Determination of Non-Significance

Description of Proposal: Construction of a new approximately 38,500 s.f. Washington Army National Guard Readiness Center building with associated improvements and detached storage buildings. The facility will house training classrooms, unit administration storage and supply space, restrooms, an assembly hall and kitchen.

Proponent: Knutzen Engineering on behalf of Washington Army National Guard
Attn: Paul Knutzen, PE
5401 Ridgeline Dr. #160
Kennewick, WA 99338

Location of Proposal: The project site is located at the intersection of 1st Street and Polar Way upon Assessor's Parcel No. 121084000006005, located within Section 21, Township 10 North, Range 28 East, W.M., Benton County, Washington.

Lead Agency: City of Richland

The lead agency for this proposal has determined that it does not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request.

( ) There is no comment for the DNS.

(**X**) This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal for fourteen days from the date of issuance.

( ) This DNS is issued after using the optional DNS process in WAC 197-11-355. There is no further comment period on the DNS.

Responsible Official: Mike Stevens
Position/Title: Planning Manager
Address: 625 Swift Blvd., MS #35, Richland, WA 99352
Date: November 3, 2020

Signature_____

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable:

   Tri-Cities Readiness Center

2. Name of applicant:

Knutzen Engineering

3. Address and phone number of applicant and contact person:

Paul Knutzen, 5401 Ridgeline Dr. #160, Kennewick, WA 99338, 509-222-0959

4. Date checklist prepared:

October 10th, 2020

5. Agency requesting checklist:

City of Richland

6. Proposed timing or schedule (including phasing, if applicable):

Start: 01/19/2020, End: 11/18/2021

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain

Yes, the 39.9-acre parcel will be subdivided to allow for the 6.4-acre project site to be its own parcel.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

A biological report, archaeological study, Geotechnical report and Pesticide and Metals contamination survey have been completed. A hydrology report will also be prepared. NEPA documentation and concurrence memo from the National Guard Bureau. Pre-Construction Site Assessment for Environmental Condition of Property required by National Guard Bureau.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None known of.

10. List any government approvals or permits that will be needed for your proposal, if known.

Building permit; Grading and Utility permit; Construction Stormwater General Permit (DOE).

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

This project proposes a new WAARNG Readiness Center building and all associated improvements including detached storage buildings. The building proposed is an approximate 38,500 sf. The facility will be located on 6.4 acres of a 39.9-acre parcel bought by the WAARNG from the City of Richland. The 6.4-acre site will be platted as its own parcel. The facility will house training classrooms, unit administration storage and supply space, restrooms, an Assembly Hall, and a kitchen.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The project is located in Richland Washington with Benton County parcel number 121084000006005. Abbreviated legal description as follows: THAT PORTION OF THE SOUTHEAST QUARTER OF SECTION 21 AND THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 10 NORTH, RANGE 28 EAST W.M.

B. Environmental Elements [HELP]

1. *Earth* [help]

a. General description of the site:

(circle one): Flat, rolling, hilly, steep slopes, mountainous, other gently sloping

b. What is the steepest slope on the site (approximate percent slope)?

The steepest slope on site is approximately 5%.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The soil is classified as sand (SP-SM) with silt and gravel per the geotechnical report completed October of 2016.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

No.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The project site will be graded to allow for a level building foundation and proper drainage on the site. There will be approximately 15,400 CY of cut/fill which will balance on-site. Approximately 6.3 acres will be affected by the grading proposed for this project.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Erosion could occur on this site but will be minimized through implementation of BMP's during construction, including silt fencing, construction entrance, ground cover, waddles, site watering for dust control, catch basin inserts and protection. All stormwater run off will be contained and managed on site.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 3.6 acres will be impervious area or approximately 9% of the property.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Standard erosion control methods will be used, such as catch basin protection (witches hats), silt fencing, and stabilized construction entrances. Dust during construction will be controlled by the use of a water truck as necessary.

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

During construction, minor amounts of dust and exhaust from equipment activity may occur. The completed project will not affect air quality.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

None known.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Dust control measures will be implemented in accordance with recommendations by the Department of Ecology and the Benton County Clean Air Authority. Measures include but are not limited to watering, lowering speed, limit of construction vehicles, and reducing the amount of dust-generating activities on windy days.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

No water bodies in the immediate vicinity. The Columbia River is 2.4 miles east and the Yakima River is approximately 1.4 miles south west of the property.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

No.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

N/A

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No, city water will be available at the site.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

N/A

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The new impervious area on site will generate stormwater runoff. The stormwater system consists of surface infiltration.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Waste materials could not enter ground waters as it will be discharged on the surface and filtered through the soil.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

No.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

Runoff generated from pervious surfaces will either infiltrate into underlying soils or flow to on-site collection systems. Stormwater generated from impervious surfaces will be collected and treated in the site swales.

4. Plants [help]

a. Check the types of vegetation found on the site:

____deciduous tree: alder, maple, aspen, other
____evergreen tree: fir, cedar, pine, other
___shrubs
_X_grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Cheatgrass which covers 90% of the site will be removed for grading and site improvements. Big sagebrush may also be removed in areas of soil disturbance.

c. List threatened and endangered species known to be on or near the site.

None of the 27 rare plants known to occur within the vicinity of the project area have a suitable habitab on this site per the biological study performed by PBS Engineering in June of 2017. The Washington Department of Fish and Wildlife (WDFW) was contacted and it was confirmed that no sensitive plant species are mapped on this project site. It is unlikely that any of the priority plant species will be affected by this development.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Native plants and trees will be planted in interior landscaped areas and around the perimeter of the site improvements. Site will be landscaped in compliance with City of Richland Code.

e. List all noxious weeds and invasive species known to be on or near the site.

Burning brush is listed on both the Washington State and Benton County Class B Noxious Weed lists. Containment of these weeds will be a primary goal to prevent the spread to un-infested areas per the above mentioned biological report.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: **hawk**, heron, eagle, songbirds, other:
mammals: deer, bear, elk, beaver, other:
fish: bass, salmon, trout, herring, shellfish, other groundsquirrel

b. List any threatened and endangered species known to be on or near the site.

The Washington State Department of Fish and Wildlife Priority Habitat Species Maps identify the Ferruginous Hawk and burrowing owls as having potential occurrence on the project site.

c. Is the site part of a migration route? If so, explain.

Yes, the Columbia Basin is part of a migration route for a number of fowl.

d. Proposed measures to preserve or enhance wildlife, if any:

None at this time as it is unlikely that any of these species would be affected by the proposed development.

e. List any invasive animal species known to be on or near the site.

None known.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electrical wil be used for lighting and all apliances. Natural gas will be used for heating the building.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No.

b. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

The proposed structures will meet current building codes and energy efficient standards. Energy efficient light bulbs will be used.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

No.

1) Describe any known or possible contamination at the site from present or past uses.

None known. A soil analysis was performed by PBS Engineering to assess potential presence of pesticides to historical agricultural use. No detectable levels of pesticides and herbicides were found in the soil samples.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

Existing natural gas lines are present in the right of way to the north of the property but this will not affect project development.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Diesel fuel will likely be used/stored on-site for construction vehicles. No hazardous chemicals will be stored on the completed project.

4) Describe special emergency services that might be required.

The site will use typical emergency services provided through the City of Richland.

5) Proposed measures to reduce or control environmental health hazards, if any:

None at this time.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

The noise level in the area is not perceived to have any adverse effect on the project. Noise is mainly generated by vehicle traffic on surrounding streets.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Short term: Construction noises.
Long term: Automobile noise from traffic associated with the site.

3) Proposed measures to reduce or control noise impacts, if any:

Noise impacts from construction activities and ongoing operations are expected to be minimal without significant effects on the surrounding area. All operations will be in a manner with City of Richalnd code and Washinton state Maximum Environmental Noise Levels (Chapter 173-60-040 WAC).

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

Currently the proposed property is vacant land and zoned Medium Industrial I-M. Properties to the west are zoned General Business C-3 and are mostly vacant currently. The proposal is not expected to affect the nearby or adjacent properties' land use.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

Yes, the property was historically operated as irrigated farmland. The land however has laid fallow during the past few years. The land has been purchased by the State of Washington Military Department and the approximately 40 acre property will no longer be used as farmland.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

No.

c. Describe any structures on the site.

None.

d. Will any structures be demolished? If so, what?

No.

e. What is the current zoning classification of the site?

Medium Industrial I-M

f. What is the current comprehensive plan designation of the site?

Industrial

g. If applicable, what is the current shoreline master program designation of the site?

N/A

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

Approximately 150 soldiers will use the readiness center on their monthly drill weekends and an estimated 5 active Guard Reserve (AGR) soldiers as a permanent duty location.

j. Approximately how many people would the completed project displace?

None.

j. Proposed measures to avoid or reduce displacement impacts, if any:

None.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

The project will be permitted through the local jurisdictions in accordance with all applicable zoning ordinances.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

None.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

N/A

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

N/A

c. Proposed measures to reduce or control housing impacts, if any:

None needed.

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Approximately 32'. Building materials will be in conformance with City of Richland Aesthetic and Structural Requirements. The primary exterior building materials are architectural split face concrete block and prefinished metal panels.

b. What views in the immediate vicinity would be altered or obstructed?

No views are expected to be obstructed.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Landscaping, setbacks, building department façade requirements.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Parking and building lighting would be proposed for late evening and night time.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

No.

c. What existing off-site sources of light or glare may affect your proposal?

None.

d. Proposed measures to reduce or control light and glare impacts, if any:

All outdoor lighting will be in conformance with the City of Richland code requirements. Outdoor lighting will be shielded per City of Richland Muicipal Code.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

The Babe Ruth Sporting Complex is approximately 2,000 ft to the west of the project site.

b. Would the proposed project displace any existing recreational uses? If so, describe.

No.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

None needed.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

None per the Archaeological Assessment prepared by Northwest Anthropology LLC in March of 2017.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

No.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

An archaeological/cultural assessment was conducted by Northwest Anthropology LLC in March of 2017. Formal consults with affected tribes were also conducted by WAARNG in letters documented as attachments to the MFR.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

An outline of procedures has been prepared in case of inadvertent discovery of potential cultural materials and human skeletal remains by the State of Washington Military Department. This includes step by step actions that must be taken.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

The site will be directly accessed by 1st St just east of Kingsgate Way.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The site is not currently served by public transit. The nearest transit stop is located approximately 1.6 miles south east at Stevens and Stevens Center.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

155 parking stalls will be added for this project. The project will not eliminate any parking spaces.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

Yes, sidewalk will be installed within the right of way along the 1st St frontage.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

276 Vehicular trips on a typical week day assuming 155 soldiers are at the training center. Peak AM volumes would occur between 7-9 AM and peak PM volumes would occur between 4-6 PM. The 9th edition ITE Trip Generation manual was used with use code 501 Military Base.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

No.

h. Proposed measures to reduce or control transportation impacts, if any:

None at this time.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

Yes, the site will utilize fire and police protection. The permanent duty soldiers will utilize health care and schools.

b. Proposed measures to reduce or control direct impacts on public services, if any.

The completed project will provide additional tax revenue for the City and will pay impact fees for development.

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

e. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electricity- City of Richland Energy Services
Natural Gas- Cascade Natural Gas
Sewer- City of Richland
Water- City of Richland
Telephone- Ziply Fiber
Internet- Charter Communications

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: Paul Knutzen

Name of signee Paul Knutzen

Position and Agency/Organization President/Knutzen Engineering

Date Submitted: 10/29/2020

ESA LISTED SALMONIDS CHECKLIST

This worksheet was designed to help project proponents and government agencies identify when a project needs further analysis regarding adverse effects on ESA (Endangered Species Act) listed salmonids. Salmonids are salmon, trout and chars, e.g. bull trout. For our purposes, "ESA listed salmonids" is defined as fish species listed as endangered, threatened or being considered for listing.

If ESA listed species are present or ever were present in the watershed where your project will be located, your project has the potential for affecting them, and you need to comply with the ESA. The questions in this section will help determine if the ESA listings will impact your project.

The Fish Program Manager at the appropriate Department of Fish and Wildlife (DFW) regional office can provide information for the following two questions

1. Are ESA listed salmonids currently present in the watershed in which your project will be located?
   Yes_X_ No___
   Please describe.

2. Has there ever been an ESA listed salmonid stock present in this watershed? Yes_X_ No___ Uncertain___
   Please describe.

If you answered "yes" to either of the above questions, you should complete the remainder of this checklist.

PROJECT SPECIFICS: The questions in this section are specific to the project and vicinity.

1. Name of watershed: __Upper Mid-Columbia_____

2. Name of nearest waterbody: __Yakima River_____

3. What is the distance from this project to the nearest body of water? 7,000 Feet
   Often a buffer between the project and a stream can reduce the chance of a negative impact to fish.

4. What is the current land use between the project and the potentially affected water body (*parking lots, farmland, etc)?*

   Single family residences and commercial properties.

5. Is the project above a:
   - natural permanent barrier (waterfall) Yes___ NoX__
   - natural temporary barrier (beaver pond) Yes___ No_X_
   - man-made barrier (culvert, dam) Yes___ No_X_
   - other (explain):

6. If yes, are there any resident salmonid populations above the blockage? Yes___ No_X_ Don't know___

7. What percent of the project will be impervious surface (including pavement & roof area)?

Approximately 9% of the 40 acre site.

FISH MIGRATION: The following questions will help determine if this project could interfere with migration of adult and juvenile fish.
Both increases and decreases in water flows can affect fish migration.

1. Does the project require the withdrawal of:
   i. Surface water? Yes___ No_X__
      Amount _____
      Name of surface water body _____

   ii. Ground water? Yes___ No_X_
      Amount _____
      From where _____
      Depth of well _____

2. Will any water be rerouted? Yes___ No_X_
   If yes, will this require a channel change?

3. Will there be retention or detention ponds? Yes_X_ No___
   If yes, will this be an infiltration pond or a surface discharge to either a municipal storm water system or a surface water body?

   If to a surface water discharge, please give the name of the waterbody.

   The runoff generated on-site will be routed to an infiltration pond on-site.

4. Will this project require the building of new roads?
   Yes___ No_X_ *Increased road mileage may affect the timing of water reaching a stream and may impact fish habitat.*

5. Are culverts proposed as part of this project? Yes___ No_X_

6. Will topography changes affect the duration/direction of runoff flows? Yes___ No_X_ If yes, describe the changes.

7. Will the project involve any reduction of the floodway or floodplain by filling or other partial blockage of flows? Yes ___ No _X_
   If yes, how will the loss of flood storage be mitigated by your project?

WATER QUALITY: The following questions will help determine if this project could adversely impact water quality. Such impacts can cause problems for listed species.
Water quality can be made worse by runoff from impervious surfaces, altering water temperature, discharging contaminants, etc.

1. Do you know of any problems with water quality in any of the streams within this watershed? Yes___ No_X__
   If yes, describe.

2. Will your project either reduce or increase shade along or over a waterbody? Yes___ No_X_
   R*emoval of shading vegetation or the building of structures such as docks or floats often result in a change in shade.*

3. Will the project increase nutrient loading or have the potential to increase nutrient loading or contaminants (fertilizers, other waste discharges, or runoff) to the waterbody? Yes___ No_X_

4. Will turbidity be increased because of construction of the project or during operation of the project? Yes___ No_X_
   In-water or near water work will often increase turbidity.

5. Will your project require long term maintenance, i.e. bridge cleaning, highway salting, chemical sprays for vegetation management, clearing of parking lots?
   Yes___ No _X_ If yes, please describe.

VEGETATION: The following questions are designed to determine if the project will affect riparian vegetation, thereby, adversely impacting salmon.

1. Will the project involve the removal of any vegetation from the stream banks? Yes___ No_X_

   If yes, please describe the existing conditions, and the amount and type of vegetation to be removed.

2. If any vegetation is removed, do you plan to re-plant?
   Yes___ No_X_ If yes, what types of plants will you use?

GENERAL NOTES

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE INTERNATIONAL BUILDING CODE (IBC), THE CURRENT EDITION OF WSDOT STANDARD SPECIFICATION FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION M41-10, THE CITY STANDARDS AND SPECIFICATIONS, EASTERN WASHINGTON STORMWATER MANUAL, AND LOCAL RULES AND STANDARDS OF GOVERNING AGENCIES HAVING JURISDICTION.
2. PRIOR TO DIGGING VERIFY LOCATION AND DEPTH OF UTILITIES AND ANY OTHER UNDERGROUND INTERFERENCE. CALL TWO BUSINESS DAYS BEFORE YOU DIG AT 811.
3. STATEMENT OF ERRORS, AMBIGUITIES AND OMISSIONS: ANY ERRORS, AMBIGUITIES, AND OMISSION IN DRAWINGS AND/OR SPECIFICATIONS SHALL BE REPORTED TO KNUTZEN ENGINEERING FOR CORRECTION BEFORE ANY PART OF THE WORK IS STARTED. UNLESS EXPRESSLY STIPULATED NO ADDITIONAL ALLOWANCE WILL BE MADE IN THE CONTRACTOR AND/OR MANUFACTURE'S FAVOR BY VIRTUE OF ERRORS, AMBIGUITIES, AND/OR OMISSIONS WHICH SHOULD HAVE BEEN DISCOVERED DURING THE PREPARATION OF BID ESTIMATE AND DIRECTED TO THE ATTENTION OF KNUTZEN ENGINEERING IN A TIMELY MANNER. KNUTZEN ENGINEERING ACCEPTS NO RESPONSIBILITY FOR WORK DONE BY THE CONTRACTOR OR SUBCONTRACTORS CONTRARY TO THE PLANS OR SPECIFICATIONS. SUBSTITUTION OR CHANGES WILL NOT BE ACCEPTED UNLESS APPROVED IN WRITING. THE SUBCONTRACTOR SHALL REVIEW ALL SECTIONS OF SPECIFICATIONS AND ALL SHEETS OF THE PLANS FOR ANY INFORMATION OR DETAILS PERTAINING TO THEIR SPECIFIC TRADE.
4. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF SITE CONDITIONS, INSTALLATION STANDARDS AND CONSTRUCTION CONDITIONS. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS PRIOR TO SHOP FABRICATION AND/OR FIELD ERECTION. DISCREPANCIES BETWEEN SITE CONDITIONS AND THE CONSTRUCTION DRAWINGS SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER. WORK DONE WITHOUT THE ENGINEERS APPROVAL IS THE RESPONSIBILITY OF THE CONTRACTOR. LOCATIONS OF EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE ONLY. CONTRACTOR IS FULLY RESPONSIBLE FOR ANY AND ALL DAMAGE WHICH MIGHT OCCUR TO EXISTING UTILITIES.
5. CONTRACTOR IS TO PROVIDE A METHOD OF CONSTRUCTION OF OFF-SITE WORK THAT WILL ALLOW MINIMAL DISTURBANCE TO TRAFFIC FLOWS ON PUBLIC AND PRIVATE WAYS.
6. ALL SPECIAL INSPECTION AND TESTING SHALL BE PERFORMED BY AN INDEPENDENT INSPECTION AND TESTING AGENCY HIRED BY THE OWNER. CONTRACTOR TO COORDINATE WITH INSPECTION AND TESTING AGENCY FOR REQUIRED CONSTRUCTION INSPECTIONS AND MATERIAL TESTING.
7. CONTRACTOR SHALL PROTECT EXISTING PROPERTY CORNERS. IF CORNERS ARE DISTURBED THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIRING A PROFESSIONAL LAND SURVEYOR TO RE-ESTABLISH THE PROPERTY CORNER(S).
8. THE CONTRACTOR SHALL REFERENCE RECOMMENDATIONS OF THE GEO-TECHNICAL ENGINEERS SOILS REPORT BY PBS DATED OCTOBER 18, 2016. PROJECT NUMBER 64395.000.
9. CONTRACTOR SHALL REPAIR OR REPLACE ANY DAMAGED CURBING OR SIDEWALK WITH IN THE RIGHT OF WAY PER CITY SPECIFICATIONS.
10. ALL ACCESSIBLE ACCESS PATHS, RAMPS, PARKING, AND SIGNAGE SHALL BE TO CURRENT ACCESSIBLE CODES.
11. CONTRACTOR TO CONTRACT WITH A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF WASHINGTON TO PROVIDE CONSTRUCTION STAKING SERVICES. IN ACCORDANCE WITH CITY REQUIREMENTS, CONTRACTED SURVEYOR SHALL PROVIDE SURVEYED ASBUILTS AS WELL AS LEGAL DESCRIPTIONS REQUIRED TO RECORD NEW EASEMENTS OR VACATED OLD EASEMENTS (WHERE APPLICABLE) UPON COMPLETION OF PROJECT, 4 WEEKS PRIOR TO GOAL FOR OBTAINING CERTIFICATE OF OCCUPANCY.
12. COSTS FOR GENERAL CONSTRUCTION ITEMS WHICH ARE NOT SHOWN ON THESE DRAWINGS, BUT ARE NECESSARY AND NORMAL FOR COMPLETION OF THIS PROJECT, SHALL BE CONSIDERED INCIDENTAL AND INCLUDED IN THE CONTRACTORS BID FOR THIS PROJECT.

EARTHWORK

1. ALL STRUCTURAL FILL OR BACKFILL SHALL BE COMPACTED TO 95% OF MAXIMUM DENSITY IN ACCORDANCE WITH ASTM D1557. ALL STRUCTURAL FILL AND BACKFILL SHALL BE PLACED IN MAXIMUM 8" LIFTS. MOISTURE CONDITIONED TO WITHIN 2% OF OPTIMUM MOISTURE CONTENT.
2. REMOVE ALL DEBRIS FROM THE AREA TO BE BACKFILLED PRIOR TO BACKFILLING.
3. SATISFACTORY NATIVE SOILS SHALL BE FREE OF ROCK OR GRAVELS LARGER THAN 3" IN ANY DIMENSION, DEBRIS, WASTE OR FROZEN MATERIAL, NATIVE VEGETATION, OR OTHER DELETERIOUS MATTER.
4. PLACE LOAD BEARING BACKFILL IN LAYERS NOT MORE THAN 8" THICK, LOOSE MEASUREMENT. SPREAD AND COMPACT EACH LAYER UNIFORMLY TO THE REQUIRED DENSITY.
5. THE CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE IN KIND ANY UTILITIES AND OR IRRIGATION PIPING DISTURBED AND OR DAMAGED DURING THE WORK.
6. ALL AREAS TO RECEIVE STRUCTURAL IMPROVEMENTS, PARKING IMPROVEMENTS, AND ROADWAY IMPROVEMENTS SHALL BE STRIPPED OF ALL VEGETATION, ORGANIC MATERIAL, DEMOLITION DEBRIS, THE SOIL SHALL BE SCARIFIED TO A DEPTH OF 12 INCHES AND COMPACTED TO 92% MDD IN ACCORDANCE WITH ASTM D1557.
7. ALL EXPOSED CUT SLOPES SHALL BE STABILIZED WITH HYDROMULCH TO PREVENT EROSION.
8. STORM PONDS/SWALES SIDEWALLS SHALL BE COMPACTED TO 85% MDD PER ASTM D1557. THE POND BOTTOM SHALL BE SCARIFIED TO A DEPTH OF 18 INCHES WITH A RIPPER UPON COMPLETION OF THE PONDS/SWALES PUSH OUT.

SITE UTILITIES

1. A PRE-CONSTRUCTION CONFERENCE SHALL BE SCHEDULED WITH THE CONTRACTOR, ENGINEER, ARCHITECT, CITY PERSONNEL, AND ANY AFFECTED UTILITIES PRIOR TO START OF UTILITY WORK.

SPECIAL INSPECTION

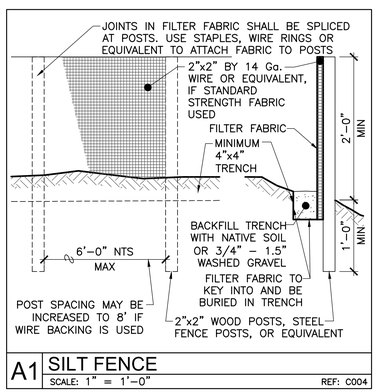
1. PER IBC 1705.6, PRIOR TO PLACEMENT OF PREPARED FILL, THE SPECIAL INSPECTOR SHALL DETERMINE THAT THE SITE HAS BEEN PREPARED IN ACCORDANCE WITH THE APPROVED SOILS REPORT.
2. PER IBC 1705.6, WHERE FILL EXCEEDS 12" IN DEPTH, THE SPECIAL INSPECTOR SHALL HAVE CONTINUOUS INSPECTION OF FILL PLACEMENT AND COMPACTION.
3. TESTING AGENCY WILL TEST COMPACTION OF SOILS IN PLACE ACCORDING TO ASTM D 1557, ASTM D 2167, ASTM D 2937, ASTM D 6938, AS APPLICABLE. TESTS WILL BE PERFORMED AT THE FOLLOWING LOCATIONS AND FREQUENCIES:
   A. FOUNDATION, PAVING, AND ADJACENT: AT SUBGRADE AND AT EACH COMPACTED FILL AND BACKFILL LAYER, AT LEAST 1 TEST FOR EVERY 5,000 SQ. FT. OR LESS OF PAVED AREA OR BUILDING SLAB, BUT IN NO CASE FEWER THAN 1 TEST PER DAY.
   B. TRENCH BACKFILL: AT EACH COMPACTED INITIAL AND FINAL BACKFILL LAYER, AT LEAST 1 TEST FOR EACH 150 FEET OR LESS OF TRENCH LENGTH, BUT NO LESS THAN 1 TEST PER DAY.
4. COMPACTION TESTING IS REQUIRED AT THE ABOVE SCHEDULE UNLESS GREATER TESTING IS RECOMMENDED BY STRUCTURAL DRAWINGS. LESS TESTING WOULD BE ACCEPTABLE IF APPROVED IN WRITING BY GEOTECHNICAL ENGINEER, SPECIAL INSPECTOR, FOUNDATION ENGINEER, AND KNUTZEN ENGINEERING.

EROSION CONTROL

1. PROVIDE TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES TO PREVENT SOIL EROSION AND DISCHARGE OF SOIL BEARING WATER RUNOFF OR AIRBORNE DUST TO ADJACENT PROPERTIES, WALKWAYS, AND DESIGNATED STORMWATER SWALES ACCORDING TO REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
2. ESTABLISH CONSTRUCTION ACCESS.
   A. CONSTRUCTION VEHICLE ACCESS AND EXIT SHALL BE LIMITED TO ONLY NECESSARY LOCATIONS. ACCESS POINTS SHALL BE STABILIZED WITH QUARRY SPALL OR CRUSHED ROCK TO MINIMIZE THE TRACKING OF SEDIMENT ONTO PUBLIC ROADS, MINIMUM 100 FEET LONG.
   B. WHEEL WASH OR TIRE BATHS SHOULD BE LOCATED ON-SITE, IF NEEDED TO PREVENT EXCESSIVE TRACKING OF SEDIMENT ON ROADS.
   C. PUBLIC ROADS SHALL BE CLEANED THOROUGHLY AT THE END OF EACH DAY. SEDIMENT SHALL BE REMOVED FROM ROADS BY SHOVELING OR PICKUP SWEEPING AND SHALL BE TRANSPORTED TO A CONTROLLED SEDIMENT DISPOSAL AREA. STREET WASHING WILL BE ALLOWED ONLY AFTER SEDIMENT IS REMOVED IN THIS MANNER.
   D. STREET WASH WASTEWATER SHALL BE CONTROLLED BY PUMPING BACK ON-SITE, OR OTHERWISE BE PREVENTED FROM DISCHARGING INTO SYSTEMS TRIBUTARY TO STATE SURFACE WATERS.
   E. A SEPARATION GEOTEXTILE SHALL BE PLACED UNDER THE SPALLS TO PREVENT FINE SEDIMENT FROM PUMPING UP INTO THE ROCK PAD. THE GEOTEXTILE SHALL MEET THE FOLLOWING STANDARDS:
      I. GRAB TENSILE STRENGTH (ASTM D4632) 200 PSI/MINUTE.
      II. GRAB TENSILE ELONGATION (ASTM D4632) 30% MAXIMUM.
      III. MULLEN BURST STRENGTH (ASTM D3786-80A) 400 PSI/MINUTE.
      IV. AOS (ASTM D4751) 20 TO 45 (US STANDARD SIEVE SIZE).
   F. CONSIDER EARLY INSTALLATION OF THE FIRST LIFT OF ASPHALT IN AREAS THAT WILL BE PAVED; THIS CAN BE USED AS A STABILIZED ENTRANCE. ALSO CONSIDER THE INSTALLATION OF EXCESS CONCRETE AS A STABILIZED ENTRANCE. DURING LARGE CONCRETE POURS, EXCESS CONCRETE IS OFTEN AVAILABLE FOR THIS PURPOSE.
   G. WHENEVER POSSIBLE, THE ENTRANCE SHALL BE CONSTRUCTED ON A FIRM, COMPACTED SUBGRADE. THIS CAN SUBSTANTIALLY INCREASE THE EFFECTIVENESS OF THE PAD AND REDUCE THE NEED FOR MAINTENANCE.
   H. QUARRY SPALLS SHALL BE ADDED IF THE PAD IS NO LONGER IN ACCORDANCE WITH THE SPECIFICATIONS.
   I. IF THE ENTRANCE IS NOT PREVENTING SEDIMENT FROM BEING TRACKED ONTO PAVEMENT, THEN ALTERNATIVE MEASURES TO KEEP THE STREETS FREE OF SEDIMENT SHALL BE USED. THIS MAY INCLUDE STREET SWEEPING, AN INCREASE IN THE DIMENSIONS OF THE ENTRANCE, OR THE INSTALLATION OF A WHEEL WASH.
   J. ANY QUARRY SPALLS THAT ARE LOOSENED FROM THE PAD, WHICH END UP ON THE ROADWAY, SHALL BE REMOVED IMMEDIATELY.
   K. UNTIL PROJECT COMPLETION AND SITE STABILIZATION, ALL CONSTRUCTION ACCESSES INTENDED AS PERMANENT ACCESS FOR MAINTENANCE SHALL BE PERMANENTLY STABILIZED.
3. CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY SILT FENCING TO PREVENT ANY WATER RUNOFF FROM ANY DISTURBED AREAS. AT A MINIMUM, SILT FENCE WILL BE ALONG THE DOWN SLOPE PROPERTY LINES. THE SILT FENCES SHALL BE CONSTRUCTED IN THE AREAS OF CLEARING, GRADING, OR DRAINAGE PRIOR TO STARTING THOSE ACTIVITIES. THE SILT FENCE SHALL PREVENT SOIL CARRIED BY RUNOFF WATER FROM GOING BENEATH, THROUGH, OR OVER THE TOP OF THE SILT FENCE, BUT SHALL ALLOW THE WATER TO PASS THROUGH THE FENCE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR DEVELOPING AND MAINTAINING A DUST CONTROL PLAN. DUST CONTROL SHALL BE IN ACCORDANCE WITH ALL LOCAL ORDINANCES. ALL DUST CONTROL MEASURES SHALL BE DONE WITH A PERSON OPERATED WATERING DEVICE (E.G. WATER TRUCK, WATER WAGON, ETC.) NO UNATTENDED WATERING ALLOWED. NO IRRIGATION LINES OR OTHER IRRIGATION/SPRINKLER TYPE WATERING DEVICES ALLOWED.
5. CONTRACTOR SHALL PROTECT EXISTING STORMWATER INLETS WITH INLET PROTECTION.
6. INSPECT, REPAIR, AND MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES DURING CONSTRUCTION UNTIL PERMANENT VEGETATION HAS BEEN ESTABLISHED.
7. REMOVE EROSION AND SEDIMENTATION CONTROLS ONCE THEY ARE NO LONGER NEEDED AND RESTORE AND STABILIZE AREAS DISTURBED DURING REMOVAL.

STORMWATER PREVENTION POLLUTION PLAN

1. CONTRACTOR SHALL BE RESPONSIBLE FOR PREPARING AND IMPLEMENTING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH STORMWATER MANAGEMENT MANUAL FOR EASTERN WASHINGTON (SWMMEW).
2. WHENEVER INSPECTION AND OR MONITORING REVEALS THAT THE BMP'S IDENTIFIED IN THE CONSTRUCTION SWPPP ARE INADEQUATE, DUE TO THE ACTUAL DISCHARGE OF OUR POTENTIAL TO DISCHARGE A SIGNIFICANT AMOUNT OF ANY POLLUTANT, THE SWPPP SHALL BE MODIFIED, AS APPROPRIATE AND IN A TIMELY MANNER.
3. THE ENGINEER HAS OBTAINED A PERMIT FROM ECOLOGY FOR GENERAL CONSTRUCTION STORM WATER. UPON COMMENCEMENT OF PROJECT, THE CONTRACTOR SHALL TRANSFER THE PERMIT INTO THEIR NAME AND BE RESPONSIBLE FOR THE PERMIT AND ALL PERMITTING REQUIREMENTS.



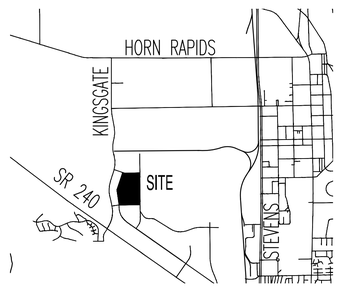
A1 SILT FENCE
SCALE: 1" = 1'-0" REF: C004

REFERENCE SOURCES

1. EASTERN WASHINGTON STORMWATER MANUAL CAN BE FOUND AT: (https://fortress.wa.gov/ecy/publications/documents/1810044.pdf).
2. THE CITY OF RICHLAND STANDARD SPECIFICATIONS AND DRAWINGS CAN BE FOUND AT: (https://www.ci.richland.wa.us/departments/public-works/engineering-and-private-development/standard-details).
3. THE CITY OF RICHLAND MUNICIPAL CODE CAN BE FOUND AT: (https://www.codepublishing.com/WA/Richland/).

VICINITY MAP

NORTH



LEGEND AND ABBREVIATIONS

NEW	EXISTING	
		ACCESSIBLE PARKING MARKER
AVR	(E)AVR	AIR VAC RELIEF
AD	(E)AD	AREA DRAIN
GUY	(E)GUY	GUY WIRE
BOA	(E)BOA	BLOW OFF ASSEMBLY
BO	(E)BO	BOLLARD
		CAP
CB	(E)CB	CATCH BASIN ROUND/SQUARE
CB		CATCH BASIN SOLID
CO	(E)CO	CLEAN OUT
		CONTINUOUS DEFLECTIVE SEPARATION UNIT
DS	(E)DS	DOWN SPOUT
DW	(E)DW	DRY WELL
EM	(E)EM	ELECTRICAL METER
EV	(E)EV	ELECTRICAL VAULT
GM	(E)GM	GAS METER
FDC	(E)FDC	FIRE DEPARTMENT CONNECTION
FH	(E)FH	FIRE HYDRANT
FP	(E)FP	FLAG POLE
IV	(E)IV	IRRIGATION VALVE
LP	(E)LP	LIGHT POLE
SD SS MH	(E)SD (E)SS (E)MH	MANHOLE
		PAVEMENT ARROWS
PIV	(E)PIV	POST INDICATOR VALVE
PP	(E)PP	POWER POLE
		REDUCER
		SHRUB
		SLOPE DIRECTION/PIPE SLOPE
SB	(E)SB	STORM BUBBLER
SIGN	(E)SIGN	STREET SIGN
SL	(E)SL	STREET LIGHT
TP	(E)TP	TELEPHONE PEDESTAL
		THRUST BLOCK
XFMR	(E)XFMR	TRANSFORMER
		TREE
U G P J	U G P J	UTILITY BOX
VAN		VAN PAVEMENT MARKING
WV	(E)WV	WATER VALVE
WM/IM	(E)WM/IM	WATER/IRRIGATION METER
WP YH	MON YH	WORK/MONUMENT POINT YARD HYDRANT

NEW ASPHALT	EXISTING ASPHALT
NEW HEAVY ASPHALT	EXISTING CONCRETE
NEW HEAVY CONCRETE	EXISTING GRAVEL
NEW CONCRETE	EXISTING LAWN
NEW GRAVEL	EXISTING LANDSCAPE
NEW LAWN	EXISTING UNDEVELOPED
NEW LANDSCAPE	REMOVE LANDSCAPE
NEW PLAY ASPHALT	REMOVE ASPHALT
NEW NATIVE	REMOVE CONCRETE
NEW TRUNCATED DOMES	REMOVE GRAVEL
NEW RIP RAP	REMOVE LAWN
	REMOVE UNDEVELOPED

ABAND	ABANDONED	PDP	PERFORATED DRAIN PIPE
BOT	BOTTOM	PE	POLYETHYLENE
BW	BOTTOM OF WALL ELEVATION	PS	PRESSURE SEWER
COM	COMMUNICATIONS	ROW	RIGHT-OF-WAY
(E)	EXISTING	R	RADIUS
FO	FIBER OPTICS LINE	RWL	RAIN WATER LEADER
FF	FINISH FLOOR	SS	SANITARY SEWER
FG	FINISH GRADE	SLV	PIPE SLEEVE
FR	FIRE RISER	XXX.XX	SPOT ELEVATION
FW	FIRE WATER	SD	STORM DRAIN
GL	GUTTER LINE	T	TELEPHONE
IE	INVERT ELEVATION	TV	TELEVISION
IR	IRRIGATION	TA	TOP OF ASPHALT ELEVATION
LS	LANDSCAPE	TC	TOP OF CONCRETE ELEVATION
MON	MONUMENT	TG	TOP OF GRAVEL ELEVATION
NG	NATURAL GAS	TW	TOP OF WALL ELEVATION
NIC	NOT IN CONTRACT	TYP	TYPICAL
NTS	NOT TO SCALE	W	WATER
OHP	OVERHEAD POWER		
P	POWER		

	SAWCUT LINE
	NEW EASEMENT LINE
	PROPERTY LINE
100	EXISTING CONTOUR
100	NEW CONTOUR
	EXISTING FENCE
	NEW FENCE
	REMOVE FENCE
	REMOVE SURFACE FEATURE
	REMOVE UNDERGROUND UTILITY
	ABANDONED UNDERGROUND UTILITY
	EXISTING UNDERGROUND UTILITY
	NEW UNDERGROUND UTILITY
	RAIL ROAD TRACKS

DRAWING INDEX

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PAUL T. KNUTZEN STATE OF WASHINGTON 44510 REGISTERED PROFESSIONAL ENGINEER
10/23/20

TRI-CITIES READINESS CENTER
WASHINGTON
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20-02662

Revisions

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www.knutzenengineering.com

MASS GRADING

GENERAL NOTES AND LEGEND

Project # 20020

C0.00

Date:OCTOBER 23, 2020

TOPOGRAPHICAL SURVEY

PORTIONS OF THE SE1/4 OF SECTION 21 &
THE NE1/4 OF SECTION 28,
TOWNSHIP 10 NORTH, RANGE 28 EAST, WILLAMETTE MERIDIAN,
CITY OF RICHLAND, BENTON COUNTY, WASHINGTON

CURVE TABLE					
CURVE	LENGTH	RADIUS	DELTA	CHORD BEARING	CHORD
C1	346.07 (346.10)	800.00 (800.07)	24°47'08"	S78°07'18"E	343.38 (343.41)
C2	363.38 (363.41)	840.00 (840.08)	24°47'08"	S78°07'18"E	360.58 (360.58)
C3	78.54 (78.55)	50.00 (50.00)	89°59'41"	N45°31'02"W	70.71 (70.72)
C4	84.73 (84.74)	1766.29 (1766.45)	2°44'54"	S88°36'13"W	84.72 (84.73)

UTILITY CONTACT INFO:

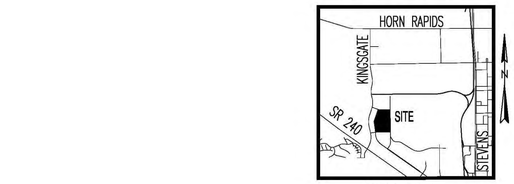
CITY OF RICHLAND: PUBLIC SERVICES (WATER/SEWER)
JASON RUTHERFORD
(509) 942-7741
EMAIL: JREATHAFORD@CI.RICHLAND.WA.US

CITY OF RICHLAND: ELECTRICAL SERVICES
KELLY D. HILL, PE
CHIEF ELECTRICAL ENGINEER
CITY OF RICHLAND
(509) 942-7416
EMAIL: KHILL@CI.RICHLAND.WA.US

FRONTIER COMMUNICATIONS: TELE/COMM
4916 W CLEARWATER AVE,
KENNEWICK, WA 99336
(509) 736-3700

*GAS WAS NOT LOCATED AND/OR MARKED BY UNDERGROUND UTILITIES.
CASCADE NATURAL GAS:
78113 W GRANDRIDGE BLVD.
KENNEWICK, WA 99336
(888) 522-1130

SITE SURVEY PROVIDED
FOR INFORMATION ONLY



VICINITY MAP
NTS

DESCRIPTION-LOT 1 ROS 4852

THAT PORTION OF THE SOUTHEAST QUARTER OF SECTION 21 AND THE NORTHEAST QUARTER OF SECTION 28, TOWNSHIP 10 NORTH, RANGE 28 EAST, WILLAMETTE MERIDIAN, BENTON COUNTY, WASHINGTON, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE SOUTHEAST CORNER OF SAID SECTION 21; THENCE SOUTH 89°22'08" WEST ALONG THE SOUTH LINE THEREOF 2535.21 FEET TO THE EAST LINE OF TRACT 2 AS DEPICTED ON THAT RECORD OF SURVEY RECORDED IN VOLUME 1 OF SURVEYS, PAGE 2515, RECORDS OF SAID COUNTY AND STATE AND THE TRUE POINT OF BEGINNING;

THENCE NORTH 00°32'00" WEST ALONG THE EAST LINE THEREOF 1156.30 FEET; THENCE CONTINUING ALONG SAID EAST LINE NORTH 22°28'15" EAST 241.34 FEET TO THE SOUTH RIGHT-OF-WAY MARGIN OF A PUBLIC ROAD KNOWN AS FIRST STREET, DEDICATED BY CITY OF RICHLAND ORDINANCE 07-15, RECORDED UNDER AUDITOR'S FILE NUMBER 2015-008673, RECORDS OF SAID COUNTY AND STATE; THENCE SOUTH 65°43'44" EAST ALONG SAID SOUTH RIGHT-OF-WAY MARGIN 9.96 FEET; THENCE ALONG A CURVE TO THE LEFT THROUGH A CENTRAL ANGLE OF 24°47'08" HAVING A RADIUS OF 840.08 FEET AND AN ARC LENGTH OF 363.41 FEET; THENCE NORTH 89°29'08" EAST 899.90 FEET; THENCE ALONG A CURVE TO THE RIGHT THROUGH A CENTRAL ANGLE OF 89°59'41" HAVING A RADIUS OF 50.00 FEET AND AN ARC LENGTH OF 78.54 FEET TO A POINT ON THE WEST RIGHT-OF-WAY MARGIN OF A PUBLIC ROAD KNOWN AS POLAR WAY AS DEDICATED BY SAID CITY OF RICHLAND ORDINANCE 07-15; THENCE SOUTH 00°31'11" EAST ALONG SAID WEST RIGHT-OF-WAY MARGIN 1157.03 FEET; THENCE LEAVING SAID WEST RIGHT-OF-WAY MARGIN AND PARALLEL TO THE SOUTH LINE OF SAID SECTION 21 SOUTH 89°22'08" WEST 1079.00 FEET; THENCE SOUTH 00°02'46" EAST 108.09 FEET; THENCE SOUTH 89°58'40" WEST 240.50 FEET; THENCE ALONG A CURVE TO THE LEFT THROUGH A CENTRAL ANGLE OF 02°44'54" HAVING A RADIUS OF 1766.45 FEET AND AN ARC LENGTH OF 84.73 FEET TO SAID EAST LINE OF SAID TRACT 2; THENCE NORTH 00°32'00" WEST ALONG THE EAST LINE THEREOF 19.63 FEET TO THE TRUE POINT OF BEGINNING.

CONTAINS 39.93 ACRES.

SURVEYOR'S NOTES

1. DATE OF SURVEY/MONUMENTS VISITED: MAY 2019
2. BASIS OF BEARING: NAD83(11) WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE.
3. UNITS OF MEASURE: SURVEY FEET GRID DISTANCES. MULTIPLY GRID DISTANCES BY A COMBINED SCALE FACTOR OF 1.000089616 TO ACHIEVE GROUND DISTANCES. LEGAL DESCRIPTION, REFERENCE SURVEY AND SQUARE FOOTAGE ARE GROUND DISTANCES. MULTIPLY GROUND DISTANCES BY A COMBINED SCALE FACTOR OF 0.999910392 TO ACHIEVE SURVEYED GRID DISTANCES.
4. (XXX.XX') GROUND DISTANCE.
5. EQUIPMENT/PROCEDURES: TOPCON GR3 GNSS, RTK METHOD. LINEAR CLOSURES MEET OR EXCEED STANDARDS CONTAINED IN WAC 332-130-090.
6. ⊕ FOUND MONUMENT AS NOTED
7. ● FOUND 5/8" REBAR & CAP "PERMIT SURVEY PLS 45774", UNLESS OTHERWISE NOTED.
8. O CALCULATED POINT, NOT FOUND OR SET
9. PRIMARY CONTROL POINT: POINT 1031 AND 1080 CITY OF RICHLAND SURVEY CONTROL NETWORK.
10. CONTOUR INTERVAL: 1 FOOT.
11. UNDERGROUND UTILITIES SHOWN PER LOCATE MARKINGS, CITY GIS DATA AND BY CONNECTING VISIBLE STRUCTURES.

MONUMENT NOTES

[1] FOUND 2.5" BRASS CAP IN MONUMENT CASE
[2] FOUND RAILROAD SPIKE
[3] FOUND 2.5" BRASS CAP IN MONUMENT CASE "45774"

LEGEND

- J-BOX
- STREET LIGHT
- SIGN
- FIRE HYDRANT
- WATER VALVE
- STUB
- SANITARY SEWER MANHOLE
- UP — UNDERGROUND POWER
- W — WATER
- S — SEWER

SURVEYOR'S CERTIFICATION

I, ASHLEY D. GARZA, A PROFESSIONAL LAND SURVEYOR REGISTERED IN THE STATE OF WASHINGTON, HEREBY CERTIFY TO THE BEST OF MY KNOWLEDGE, INFORMATION AND BELIEF, THAT THIS MAP IS THE RESULT OF AN ACTUAL FIELD SURVEY CONDUCTED BY ME OR UNDER MY DIRECTION AND THAT ALL INFORMATION SHOWN HEREON IS TRUE AND ACCURATELY SHOWN.

GRAPHIC SCALE
0 50' 100' 200'
1 INCH = 100' FT.
NOT TO SCALE

NO.	DATE	DESCRIPTION
0	05/28/19	ORIGINAL SUBMITTAL
1	05/30/19	UPDATED UTILITY CONTACT INFO

PERMIT SURVEYING INC
2245 Robertson Drive
Richland, Washington 99354
OFFICE 509-375-4123
FAX 509-371-0999

ALSC ARCHITECTS, PS
203 N. WASHINGTON, SUITE 400
SPOKANE, WASHINGTON

PROJECT NO.	19049
DRAWN BY:	ADG
CHECKED BY:	CCA
SCALE:	1" = 100'
REVISION	0
SHEET	1 OF 1
	SV1

SURVEY
SCALE: NOT TO SCALE

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10/23/20

TRI-CITIES READINESS CENTER
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KENNEWICK, WA 99338
1-509-222-0959
www.knutzenengineering.com

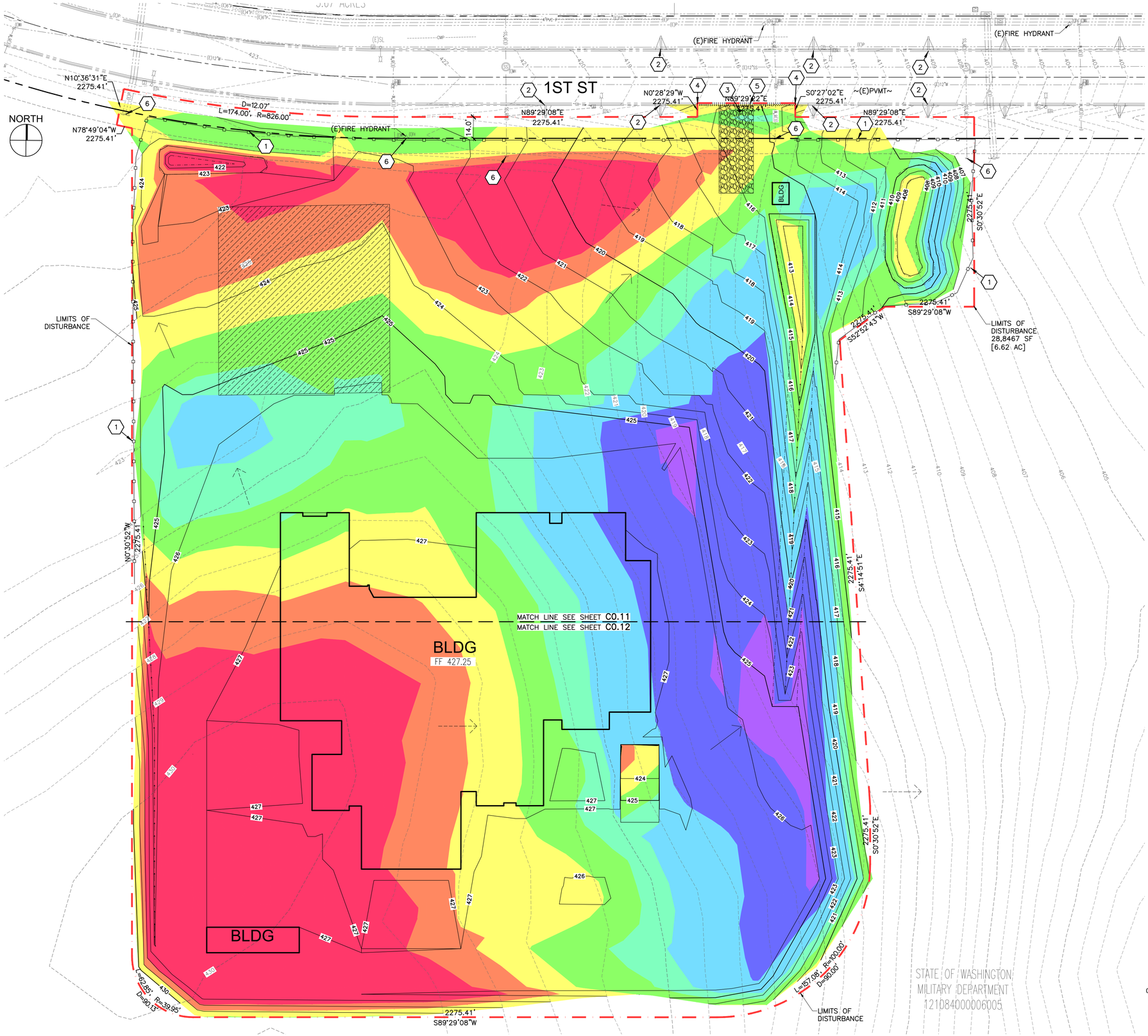
MASS GRADING

SURVEY

Project # 20020

C0.02

Date:OCTOBER 23, 2020



EROSION CONTROL AND DEMOLITION PLAN
SCALE: 1" = 30'-0"

KEY NOTES

1. SILT FENCING SHALL BE INSTALLED AT LOCATIONS SHOWN AND AS NEEDED AT ANY LOCATIONS OF SITE WHERE SURFACE RUNOFF MAY ERODE SOILS AWAY FROM SITE, CONTRACTOR SHALL INSTALL ADDITIONAL SILT FENCING AS NECESSARY, REFER TO DETAIL A1/C0.00
2. EXISTING CURB INLET TO BE PROTECTED FROM SEDIMENTS
3. CONSTRUCTION ACCESS, SEE GENERAL NOTES ON SHEET C0.00
4. SAWCUT CONCRETE CURBING AS NECESSARY FOR NEW CONSTRUCTION AT NEAREST EXPANSION/CONTROL JOINT AS INDICATED, PROVIDE NEAT CUT EDGE
5. REMOVE CONCRETE CURBING AND DISPOSE OF PROPERLY
6. PROTECT UTILITY IN PLACE

CUT / FILL INTENSITY

Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	−5.000	−2.001	
2	−2.000	−1.001	
3	−1.000	−0.001	
4	0.000	1.000	
5	1.001	2.000	
6	2.001	4.000	
7	4.001	6.000	
8	6.001	8.000	

NOTES:

1. THE GRADING SHOWN IS TO FINISH SURFACE OF MATERIALS AND NOT SUBGRADE.
2. CUT/FILL NUMBERS USED:
   GRUB −3500 CY
   IMPORT OF MATERIALS +8535 CY
   SHRINKAGE −800 CY
   FINISH GRADE CUT +8138 CY
   FINISH GRADE FILL −12867 CY
   TOTAL CUT +16673 CY
   TOTAL FILL −17167 CY
   NET −494 CY

LEGEND

- EXISTING STORMWATER FLOW PATH
- NEW STORMWATER FLOW PATH
- CONTRACTOR LAYDOWN AND STORAGE AREA
- LIMITS OF CONSTRUCTION LINE
- SILT FENCE
- CONSTRUCTION VEHICLE ACCESS POINTS TO PUBLIC ROADS
- CONSTRUCTION ACCESS EROSION CONTROL

NOTES

1. SEE SHEET C0.00 FOR GENERAL NOTES AND LEGEND.
2. MOST SUITABLE LOCATION FOR CONSTRUCTION ENTRANCE TO BE DETERMINED BY GENERAL CONTRACTOR. CONSTRUCTION ENTRANCE SHOWN ON DRAWING IS A SUGGESTED LOCATION ONLY.
3. FINAL CONSTRUCTION LAY-DOWN AREA AND STOCKPILE AREA LOCATION AND SIZE TO BE DETERMINED BY THE GENERAL CONTRACTOR WITH APPROVAL OF OWNER.
4. CUT & FILL SLOPES SHOULD BE CONSTRUCTED WITH INCLINATION NO STEEPER THEN 2H:1V AND MUST BE PROTECTED FROM WIND AND EROSION.
5. PLACE TOPSOIL, COMPACT, AND PROVIDE TEMPORARY SOIL STABILIZATION. PERMANENT LANDSCAPING CAN BE INSTALLED ONCE LIKELIHOOD OF SEDIMENTATION DURING CONSTRUCTION IS REDUCED, UPSTREAM AREAS ARE FULLY STABILIZED, AND IRRIGATION SYSTEM IS OPERATIONAL.
6. EROSION, SEDIMENT, AND AIR QUALITY CONTROL SHALL COMPLY WITH THE COUNTY AND CITY AIR QUALITY CONTROL ORDINANCES, AND THE NOTES AND DETAILS ON THESE PLANS.
7. PROVIDE INLET PROTECTION ON ALL STORM DRAIN INLETS SURROUNDING SITE, INSPECT FABRIC REGULARLY AND REPLACE AS NECESSARY IF FOUND TO BE RIPPED OR TORN.
8. ANYTIME AN OPEN TRENCH AND DEMOLITION AREAS ARE PRESENT DURING NON WORK HOURS THE CONTRACTOR SHALL HAVE PORTABLE 6.0' CHAIN LINK CONSTRUCTION FENCE IN PLACE AROUND THE WORK AREA.
9. NOT ALL UNDERGROUND UTILITIES ON THESE DRAWINGS MAY BE SHOWN. FIELD LOCATE AND VERIFY ALL UNDERGROUND UTILITIES. COORDINATE ALL RELOCATION WORK WITH THE APPROPRIATE UTILITY COMPANY AND/OR OWNER PRIOR TO ANY EXCAVATION WORK.
10. FIELD VERIFY ALL MEASUREMENTS AND INVERTS PRIOR TO START OF WORK.
11. ACP AND CONCRETE CUT LINES ARE BASED ON NEW SURFACE FEATURES TO BE INSTALLED. CUT LINES DO NOT ACCOUNT FOR GRADING, TRENCHING, GRADE TRANSITIONS, OR OVERLAY WORK. ADJUST ACTUAL CUT AS NECESSARY FOR RELATED NEW WORK.
12. REMOVE ALL EXISTING IRRIGATION SYSTEM COMPONENTS WITHIN NEW CONSTRUCTION AREAS THAT WILL INTERFERE WITH NEW WORK. CUT, CAP, AND SEAL WATERTIGHT EXISTING PIPING TO REMAIN.
13. ALL UTILITY MAINS MUST REMAIN OPERATIONAL DURING CONSTRUCTION. COORDINATE WITH THE CITY TO SCHEDULE SERVICE OUTAGES AS NEEDED.
14. CONTRACTOR TO REMOVE ANY ABANDONED UTILITY LINES AS NEEDED FOR NEW CONSTRUCTION AND PROPOSED GRADES.

0' 15' 30' 60' 90'
1" = 30'

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PAUL T. KNUTZEN
STATE OF WASHINGTON
44510
REGISTERED
PROFESSIONAL ENGINEER
10/23/20

TRI-CITIES READINESS CENTER
WASHINGTON

Revisions

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MASS GRADING

EROSION CONTROL AND DEMOLITION PLAN

Project # 20020

C0.10

Date: OCTOBER 23, 2020

NORTH

KEY NOTES

1. MEET AND MATCH EXISTING ELEVATION
2. RAISE EXISTING LID TO NEW GRADE ELEVATIONS
3. MAXIMUM 4:1 SLOPE IN LAWN/LS AREAS
4. PREPARE PADS AT PROPOSED BUILDINGS PER GEOTECHNICAL REPORTS RECOMMENDATIONS
5. DO NOT COMPACT SOILS IN SWALE AREAS BEYOND 85% OF MDD PER ASTM D1557

1ST ST

(E)FIRE HYDRANT

BLDG

BLDG

BLDG

MATCH LINE SEE SHEET C0.11
MATCH LINE SEE SHEET C0.12

MATERIAL LEGEND

- COMPACTED DIRT
- SWALE IMPORT SOIL
- LANDSCAPE/NATIVE
- 5" HEAVY ASPHALT OVER 10" BASE
- 3" ASPHALT OVER 9" BASE
- 8" HEAVY CONCRETE OVER 6" BASE
- 4" CONCRETE OVER 4" BASE
- 6" SLAB OVER 6" BASE (REFER TO STRUCTURAL)
- 4" SLAB OVER 6" BASE (REFER TO STRUCTURAL)

NOTES:

1. GRADES SHOWN AT CONCRETE, HEAVY CONCRETE, HEAVY ASPHALT, ASPHALT AND DIRT PATH ARE TO TOP OF MATERIAL, FOR MASS GRADING PORPOISES SUBTRACT MATERIALS.
2. GRADES SHOWN TO FINISH FLOOR, REFER TO STRUCTURAL FOR DIFFERING SLAB DEPTH LOCATIONS, LOCATION SHOWN HERE ARE APPROXIMATE.

NOTES

1. SEE DRAWING C0.00 FOR GENERAL NOTES AND LEGEND.
2. CONTOURS ARE TO THE TOP OF SIDEWALK, CURB, OR PAVEMENT FINISHED SURFACE UNLESS NOTED OTHERWISE.
3. FIELD VERIFY ALL MEASUREMENTS AND INVERTS PRIOR TO START OF WORK. IMMEDIATELY NOTIFY ARCHITECT OF DISCREPANCIES BEFORE WORK COMMENCES.
4. DO NOT EXCEED MAXIMUM SLOPE OF 2:1 IN ALL AREAS OF SITE.
5. FIELD VERIFY ALL MEASUREMENTS AND INVERTS PRIOR TO START OF WORK. IMMEDIATELY NOTIFY ARCHITECT OF DISCREPANCIES BEFORE WORK COMMENCES.
6. ALL SITE ELECTRICAL WORK MAY NOT BE SHOWN ON THE CIVIL SITE DRAWINGS, SITE ELECTRICAL IS SHOWN FOR REFERENCE PURPOSES ONLY. REFER TO ELECTRICAL PLANS IN THIS CONSTRUCTION PACKAGE FOR ELECTRICAL DEMOLITION, RELOCATION, AND NEW INSTALLATION.

0' 10' 20' 40' 60'
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PARTIAL MASS GRADING PLAN
SCALE: 1" = 20'-0"

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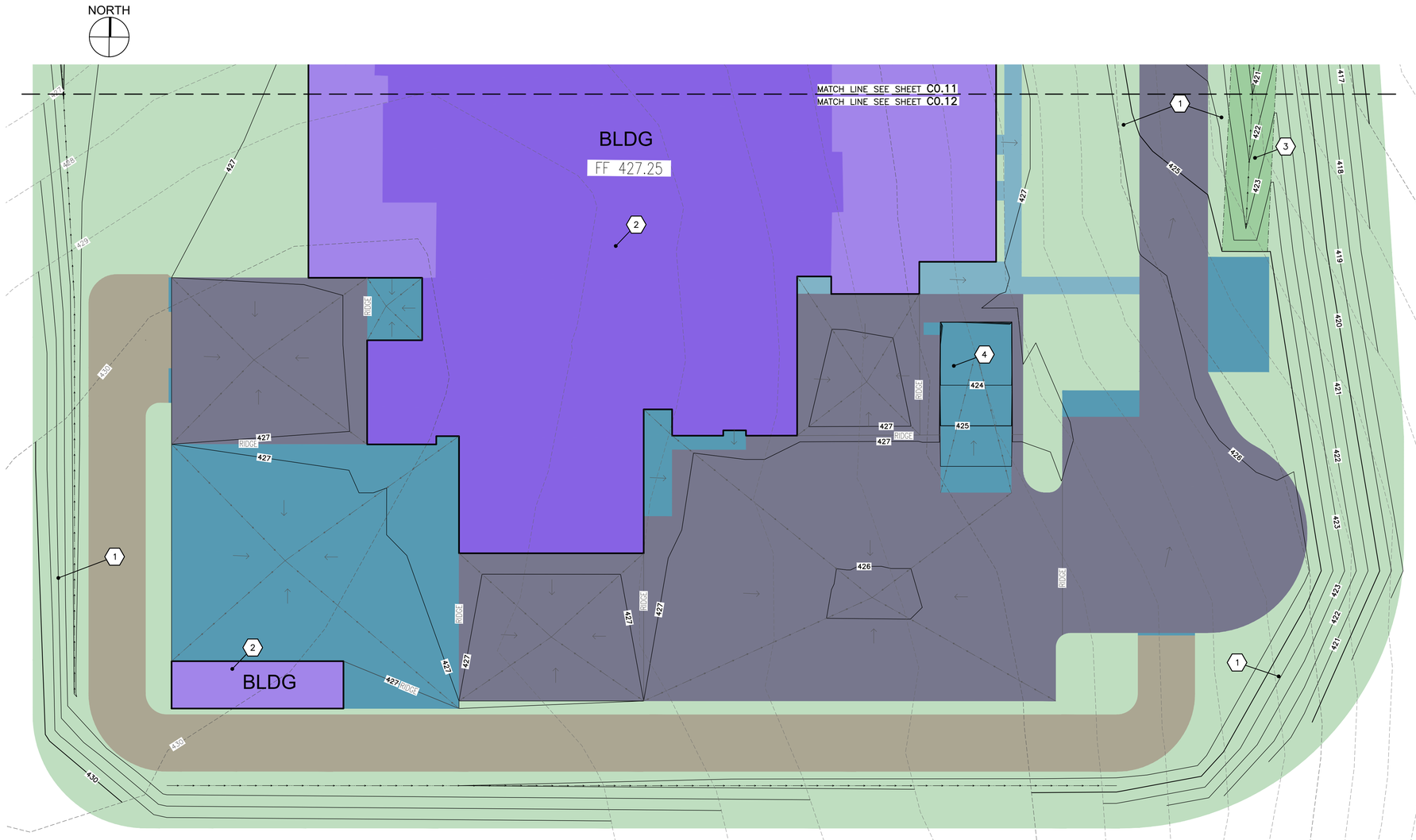
Date: OCTOBER 23, 2020



KEY NOTES

1. MAXIMUM 4:1 SLOPE IN LAWN/LS AREAS
2. PREPARE PADS AT PROPOSED BUILDINGS PER GEOTECHNICAL REPORTS RECOMMENDATIONS
3. DO NOT COMPACT SOILS IN SWALE AREAS BEYOND 85% OF MDD PER ASTM D1557
4. LOADING DOCK AREA

MATERIAL LEGEND

- COMPACTED DIRT
- SWALE IMPORT SOIL
- LANDSCAPE/NATIVE
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MASS GRADING

PARTIAL MASS GRADING PLAN

Project # 20020

C0.12

Date: OCTOBER 23, 2020

Archaeological Assessment of the 40-Acre Parcel Being Considered for the Proposed Army National Guard Readiness Center, Richland, Benton County, Washington

Prepared for:

Army National Guard
Environmental Programs,
Camp Murray, WA

Prepared by:

James Knobbs, RPA and Darby C. Stapp, PhD, RPA
Northwest Anthropology LLC
P.O. Box 1721
Richland, WA 99352
March 31, 2017

NORTHWEST ANTHROPOLOGY

Contents

Executive Summary

Northwest Anthropology LLC conducted an archaeological assessment of a 40-acre parcel in Richland, Washington, which is being considered by the Army National Guard for a readiness center. Historical research and field investigations were conducted to assess the probability that significant cultural resources are located on the property. No evidence of human occupation was found. The surface survey located no significant historic resources and no pre-contact evidence. The subsurface investigation, while minimal, produced no artifacts. The results indicate that it is unlikely any significant archaeological resources are located on the parcel.

Additional research was conducted to identify any other cultural resource-related issues that might arise should the project move forward. Native American cemeteries are not typically found in locations such as this and therefore the probability that one is located here is remote. While single burials can be found almost anywhere, we believe it unlikely that one is located on the parcel. Consideration was also given to the potential that there is a Native American traditional cultural property or property of religious and cultural significance associated with the parcel; while that determination can only be made through consultation with area tribes, preliminary indications are that the probability is low.

If the land is purchased and planning for construction of the facility begins, the Army National Guard will consult with the Washington Department of Archaeology and Historic Preservation and area Tribes as part of its compliance with the National Environmental Policy Act and National Historic Preservation Act. This assessment will assist the parties in determining whether additional cultural resource investigation is needed.

Archaeological Assessment of the 40-Acre Parcel Being Considered for the Proposed Army National Guard Readiness Center Project, Richland, Benton County, Washington

Introduction

This archaeological assessment was prepared by Northwest Anthropology LLC, under contract to PBS Engineering and Environmental, to advise the Army National Guard on potential archaeological and other cultural issues associated with purchasing a 40-acre parcel located in Richland, Washington. The assessment incorporated historical research, previous cultural work in the immediate area, and survey of the parcel. In addition, a small number of shovel test pits were excavated to gain some subsurface information about the areas where buildings and parking lot are being considered. If the National Guard proceeds with the purchase of the parcel and construction of the facility, this assessment will provide the basic information needed to begin cultural resources-related consultations associated with National Environmental Policy Act (NEPA) and National Historic Preservation Act compliance.

Location

The 40-acre parcel is located on City of Richland land, between the Columbia and Yakima rivers, in northwest Richland, Benton County, Washington (Figure 1). The parcel is located in the SW quarter of the SE quarter of Township 10 N, Range 28 E, Section 21, Willamette Meridian (Richland 7.5' USGS quadrangle, 1992). Specifically, the parcel is located in a rapidly expanding industrial section, just off Highway 240 and Kingsgate Way, between Logan Road to the south, 1st Avenue to the north, and Polar Way to the east; it is bordered by an RV park on the south, and several private parcels of land on the west (Figure 2). The parcel has been plowed and planted in wheat and corn for decades; the parcel has laid fallow during the past few years (Figure 3).

Previous Cultural Resources Investigations

The Department of Archaeology and Historic Preservation (DAHP) Washington Information System for Architectural and Archaeological Records Data WISAARD was used to identify the previous investigations and sites recorded within one mile of the 40-arcre parcel. Two sites associated with the Richland Irrigation Canal (45-BN-1172), eight early twentieth century refuse scatters, and one pre-contact ground stone tool fragment have been recorded during the eleven cultural resources investigations conducted. (Appendix A). Two of the investigations conducted focused on new roads located adjacent to the parcel (Arthur 2009 a, b). Both surveys were conducted when visibility of the plowed fields was high; neither investigation conducted any subsurface sampling. The results of both investigations were negative, and no additional work was recommended.

Large areas to the north have been surveyed over the years, the Hanford Land Conveyance being a recent example (Morton, Civay, and Payne 2012). Early twentieth century farming sites have been the dominant resource encountered, along with a few pre-contact lithic scatters and numerous isolated lithic finds.

Figure 1. Map showing the project location, in northwest Richland, Washington, Benton County. The parcel is located in Section 21, 10 N, 28E. Orange arrow points to parcel.

Figure 2. Google Earth oblique view showing the 40-acre parcel (outlined in red) location for the proposed readiness center. Note the Horn Rapids RV Resort in the foreground, and the agricultural and industrial development to the north.

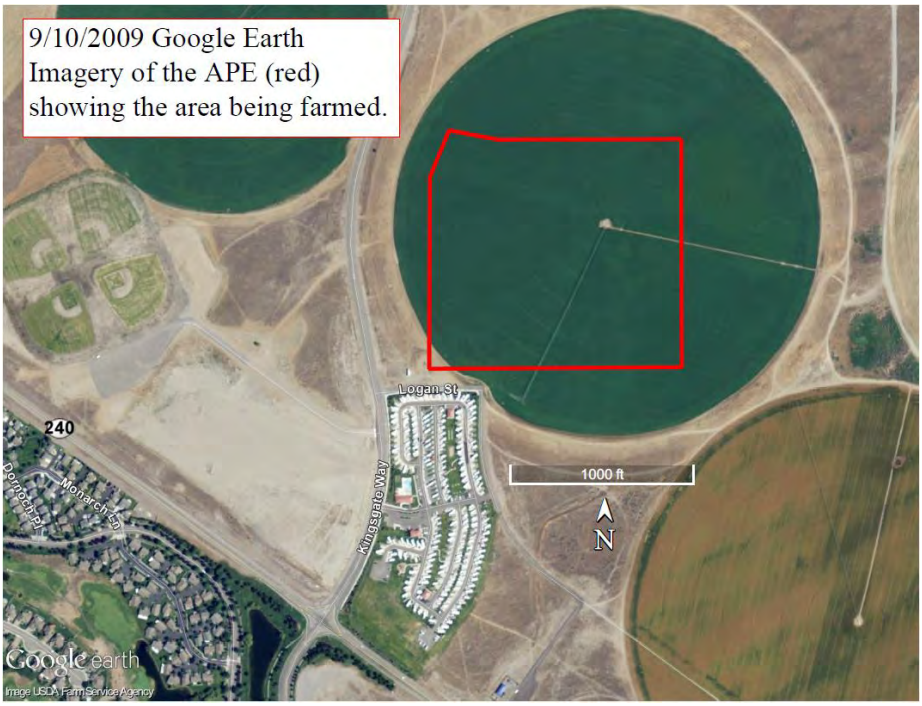

Figure 3. 2009 aerial photograph showing that the 40-acre parcel (red outline) was located within an irrigated crop circle. (Google Earth image)

Environmental Description

The 40-acre parcel lies within the semi-arid shrub-steppe Pasco Basin of the Columbia Plateau region (Duncan 2007). Average annual precipitation is less than 7 inches annually. Winds are from the west, southwest. Average temperatures range from 31 degrees F in January to 76 degrees F in July.

Weather between the post-glacial climate, 13,000 to 9,000 years before present (B.P.), to c.a. 2,500 B.P., underwent a series of fluctuations from cooler and moister to warm and dry and back to cool and wet again. After 9,000 B.P. and following the post-glacial climate, the environment warmed and became drier until ca. 4,400 to 2,500 B.P. when it became cool and wet again. From 2,500 B.P. to the present, climate conditions are thought to reflect those occurring today (Chatters 1998).

Geology

The overall surface geology of the property area includes ridges formed from stabilized sand dunes that consist of medium to fine grained aeolian sediments (Reidel and Chamness 2007). The underlying geology is associated with Miocene basalt flows, glacial flood activities, and Mio-Pliocene fluvial/lacustrine sedimentary deposits). One sedimentary deposit, unconsolidated aeolian dune sand and loess was identified within the parcel using the Washington State Department of Natural Resources Washington State Geologic Information Portal electronic database. This surface geological formation is identified as Quaternary dune sand (Qds) which characterizes Holocene dune sand, in stabilized dunes.

The Hanford formation (13,000-3.4 million years ago) underlies the Qds formation in the property area, and is made up of Pleistocene-age cataclysmic flood deposits from floodwaters including Glacial Lake Missoula, pluvial Lake Bonneville, and ice-margin lakes (Fecht et al. 2004). Unconsolidated Holocene-age, aeolian and alluvial sediments overlay the Hanford formation. These deposits consist of aeolian silts, fine-grained sands and gravels that cover most of the Hanford Site and associated areas such as the 40-acre parcel (Reidel 2004). Sand dunes have been formed from these sediments as a result of prevailing winds and sparse vegetation in the area.

Soils

The west to east trending stabilized sand dune that comprises the 40-acre parcel are the product of the strong westerly winds that dominate the landscape in this area (Duncan 2007). These landforms constrain the movement of people on foot: it is much easier to follow the contours and walk along the ridges or troughs of the dunes than to walk across them. The soils comprising these dunes, while very fruitful for many of the botanical resources valued by Native Americans, was recognized as relatively poor quality for agricultural purposes without irrigation (Kocher 1919).

The soils of the area are primarily Quincy sand (QuD). This type of soil is of relatively poor quality for agriculture, not well adapted to dry farming, being a medium to fine sand with good drainage and low amounts of organic matter, and prone to deflation through wind action (Kocher 1919). Additionally there is a smaller area of Burbank (BdB) sandy loam. Burbank

sandy loam contains very little (<1%) organic matter as well, and like the other soil type present in the property area, is excessively drained, making it poor for dry farming (NRCS 2014).

Hydrology

There is no surface water on the 40-acre parcel. Groundwater is at a depth of approximately 116 m (Hartman et al. 2007). A feeder canal from the Richland Irrigation canal constructed along the eastern end of the parcel in the early twentieth century, and later irrigation circle during recent decades may have altered the hydrologic character of the parcel.

Ecology

While the greater Hanford area supports a biologically diverse shrub-steppe plant community that has been relatively protected from disturbance (Duncan 2007), all of the 40-acre parcel has been disturbed by modern agricultural efforts. Prior to farming, the stabilized sand dunes provided good habitat for a wide variety of plants and animal species. Sackschewsky *et al*. 1992 provides a thorough description of plants species found in habitats that existed prior to development.

No plant species of rare, threatened or endangered status have been documented in the parcel area. Invasives such as *Bromus tectorum* (cheatgrass), *Salsola tragus* (tumbleweed), *Lactuca serriola* (prickly lettuce), *Erodium cicutarium* (restem filaree), *Sisymbrium altissimum* (tumblemustard), and *Centaurea* spp. (knapweeds) now dominate the landscape, with only a handful of native *Ericameria nauseosus* (Gray rabbitbrush) observed.

Animal species that would have been common prior to development include coyote (*Canis latrans*), mule deer (*Odocoileus heminonus*), long-billed curlew (*Numenisu americanus*), pygmy short-horned lizard (*Phrynosoma douglasii*), sagebrush lizard (*Sceloporus graciosus*), eastern racer snake (*Coluber constrictor*), night snake (*Hypsiglena torgquata*), and western rattlesnake (*Crotalus viridis*) (Sackschewsky *et al*. 1992).

Cultural Context

The parcel has not been previously investigated for cultural resources, however, a substantial amount of work has been accomplished to the north and east. The cultural resources in this area can be assigned to one of three cultural landscapes—the Native American Cultural Landscape, the Early Settlers and Farming Landscape, and the Manhattan Project and Cold War Era Cultural Landscape.

The Native American Cultural Landscape includes a rich record of archaeological sites associated with pre-contact and ethnographic use of the site. Native Americans have lived in and around the present-day Hanford Site for thousands of years. More than 8,000 years of pre-contact human activity have left extensive archaeological deposits along the Columbia River and, to a lesser degree, the off-river interior (Table 1). Sacred and ceremonial areas such as mountains and rivers where food and medicinal plants are gathered are dispersed across the landscape. Native American descendants of the area's original inhabitants continue to use this landscape to access traditional resources and places. These descendants include members of the Wanapum, Yakama

Nation, Nez Perce Tribe, Confederated Tribes of the Umatilla Indian Reservation, and the Confederated Tribes of the Colville Reservation.

The first non Native American outsiders came to the region as explorers, ca. 1800. The Corps of Discovery, also known as the Lewis and Clark Expedition passed through to the south in 1805-06. By 1810, a fur trade post was established approximately 20 miles to the south at the mouth of the Walla Walla River (Stern 1993). Missionaries were in the region by the 1830s, the best known being the Whitman Mission in the Walla Walla valley. As the western migration of settlers began in the 1940s. In 1855, the U.S. Government established treaties with local tribes.

The project area was surveyed by the General Land Office in 1865, paving the way for organized settlement. Homesteaders and ranchers began moving into the lower Yakima Valley and Hanford plains in the 1870s. The project area became part of Yakima County in 1865. Settlement in the Richland area did not take off until the Newlands Act was passed in 1902 providing funds for the irrigation canals. The area became part of Benton County in 1905. The Richland canal was built in 1906, a segment of which is located close to the project area (Kubik 1994).

Richland was organized in the early 1900s to service the many irrigated farms that sprung up as the Richland Irrigation Canal and other irrigation systems began operation. The early settlers' history at the Hanford Site came to an abrupt end in 1943, when the federal government condemned the land for the war effort. Farming residents were given only 30 days to vacate the land on which many had lived for decades.

Scattered remains of the North Richland farms have been located in the vicinity, characterized by farm sites, irrigation features, and small isolated trash piles. Early Benton County maps (Metzker 1934, 1943) show the Richland Irrigation Canal (45BN1125; Prendergast-Kennedy 2004) to the east of the 40-acre parcel, and no farm properties on the parcel. To the south of the parcel, approximately 1 mile, the remains of farmsteads in undeveloped portions of the 1100 Area were located, documented, and determined to be not eligible for listing in the National Register (Hale 1998; Cadoret 1999).

The project area was condemned in 1943, along with the Richland, Hanford, and White Bluffs communities. In all, 640 square miles was condemned for the Hanford Engineering Works, a part of the Manhattan Project, which constructed facilities to produce plutonium for the Manhattan Project (DOE 1996). The Manhattan Project and Cold War Era Landscape rapidly transformed the Hanford Site from an isolated agricultural region to a military industrial complex dedicated to the production of plutonium, which was later used in the first atomic bombs (DOE 1996). The U.S. Department of Energy (DOE) identified a National Register-eligible Hanford Site Manhattan Project and Cold War Era Historic District that serves to organize and delineate the evaluation and mitigation of Hanford's plutonium-production built environment. While the lands where the 40-acre parcel were located were condemned and obtained by the U.S. Government for the Hanford Engineer works, there is no documentation that any related activities occurred at this location.

In 1958, the condemned lands in Richland and surrounding area were released from the federal government to the local population. The subject parcel was assigned to the City of Richland, which has continued to own it to the present.

Table 1. Pre-Contact Cultural Sequence at the Hanford Site [a] (Morton, Civay, and Payne 2014)

Period/Phase	Years (BP)	Subsistence	Architecture	Site Types
Windust Phase	1100-8000	Large/small game, fish. Tool production: Windust, Clovis, Folsom, Scottsbluff type-projectile points, other stemmed and lanceolate projectile points, cobble tools.	Open habitation, rock shelters, caves	Open habitation, rock shelters, caves, lithic material reduction and isolated lithic tool sites.
Cascade/Vantage Phase	8000-4500	Continued large and small mammal hunting; seed, fish, and mussel foraging. Tool production: Cascade and stemmed projectile points, microblades, hammerstones, core tools, scrapers, ovate knives.	Open habitation, rock shelters, caves	Temporary camps, lithic material scatters, quarry sites, food and other resource processing sites.
Frenchman Springs Period	4500-2500	Continued small mammal hunting and increased seed, fish, mussel, root foraging; Tool production with wider tool variety: contracting stemmed, corner notch, and stemmed projectile points, knives, scrappers, gravers, ground stone and cobble tools such as mortars, pestles.	House dwellings, semi-subterranean	Lithic material scatters, quarry sites, food/other resource processing sites, seasonal camp sites, habitation sites.
Cayuse Phase I	2500-1200	Increased reliance on fish, mussels, and other riverine-based resources, roots. Tool production: corner- and basal-notched projectile points, continued wide variety of tools such as ground stone, net sinkers, cobble tools, drills, scrapers, lanceolate and pentagonal knives.	Pithouses including wall benches	Spiritual/ideological sites, lithic material scatters, quarry sites, food/resource processing sites, seasonal camp sites, habitation sites.

Table 1. Pre-Contact Cultural Sequence at the Hanford Site (continued)				
Cayuse Phase II	1200-900	Same as above	Pithouses no longer with wall benches	Same as above
Cayuse Phase III	900-250	Same as above with increased mobility from horse introduction. Tool production: corner-(decreased), stemmed, side-notched projectile points, pressure flake tools, trade goods.	Pit longhouses/villages	Same as above with increased large habitation (villages) sites and seasonal camp sites.
[a]This table was synthesized from various regional studies Benson et al 1989; Galm et al 1981; Green 1975; Morgan et al 2001; Nelson 1969; Rice 1980; Sharpe and Marceau 2001; Swanson 1962; Thoms et al 1983a; Walker 1998.				

This review of the cultural contexts and the results of cultural resource surveys conducted in the immediate area indicate that pre-contact archaeological remains are possible but unlikely to be found within the parcel, that significant farming features are unlikely to be found within the parcel, and that significant Manhattan Project/Cold War features are unlikely to be found.

Research Design

The following research design was developed based upon the archaeological settlement models for the area, the historic land use models, and the geomorphological context. The research design identifies the research questions presented from the background research and aids in the development of the data sources and methods that will be used. Research questions fall into two categories: Native American land use from arrival to the present and nineteenth and twentieth century land use associated with farming and Hanford-era plutonium production.

Native American Land Use

Our understanding of Native American land use in this region through all time periods indicate that primary habitations and associated cemeteries would be located adjacent to major waterways, such as the Columbia and Yakima Rivers. Secondary habitations would occur near areas used for gathering/hunting resources, which would be located many miles from the primary habitations. Because this area is about 2.5 miles from the Columbia where major settlements were located, this area could have been frequented on a regular basis to provide daily resources for the populations. The project area is over a mile away from the Yakima River, and farther from areas where major sites on the Yakima River are located, but a similar principle applies. People may have travelled through the area using trails, for example to get to and from the fishing camp at Horn Rapids, located at the horn of the Yakima River approximately 6 miles away. Given these assumptions, and the fact that there is no water source in or near the parcel, we would anticipate no evidence of major habitation sites or lithic scatters, but would expect isolated lithic artifacts associated with hunting or possible plant gathering.

Nineteenth and Twentieth Century Land Use

The parcel is located in an area that became agricultural in the early twentieth century. Adjacent to a major irrigation canal, we would think it likely that evidence of farming activities could be found. However, period maps indicate no farms were located there. No evidence of any roads is shown on maps. Therefore, if Euroamerican evidence is found, we would expect it to be associated with early ranching activities, or hunting before and after Hanford. There is no documentation of Hanford-era authorized use of the area. Because the parcel is several miles from the closest Hanford facilities, and there is no road to the parcel, therefore, no Hanford-era material is anticipated.

Methods for Identifying Resources

To determine the probability that significant resources are located on the 40-acre parcel being considered for purchase, the following activities were conducted:

- preliminary details concerning the proposed locations of facilities to be constructed was obtained.

- the Washington State Department of Archaeology and Historic Preservation (DAHP) predictive model was consulted.
- DAHP's Washington Information System for Architectural and Archaeological Records Data (WISAARD) was consulted to identify previous investigations and known archaeological sites.
- Historic maps and aerial photography were examined for evidence of past land use and ownership.
- Knowledge of traditional cultural interest was obtained from the Confederated Tribes of the Umatilla Indian Reservation and the Wanapum Band.
- An archaeological pedestrian survey was designed using a 10-meter survey interval. This is a standard transect width for projects of this nature.
- A shovel test pit strategy was developed to gain insight to the subsurface; neither of the other cultural reviews in this area involved any subsurface testing. Forty shovel test pits were planned for excavation at locations selected by the field supervisor to obtain subsurface information from various microenvironments.

Results of Investigations

Information Concerning Proposed Facilities

The details concerning the proposed readiness facility have not been developed. However, preliminary thoughts on where the parking lot and main building location could be located were obtained from the Army National Guard (Vo 2016). The building location would be located on the high ground to the west, and the parking lot on the low flat to the east (Figure 4).

DAHP Predictive Model

The Washington State Department of Archaeology and Historic Preservation (DAHP) cultural predictive model rates the project area as "Moderate Risk."

DAHP WISAARD Results

The WISAARD identified nine archaeological sites were identified, all historic, mostly dating to early dacades of the 20th century. One isolated artifact was identified; a ground stone item of Native American origin. The results from the WISAARD search are provided in Appendix A.

Historic Maps and Records Analysis

The following historic maps were located and reviewed for evidence of historic land use:

- The General Land Office map from 1865 for Township 10 N, Range 28 E, Section 21, Willamette Meridian shows nothing in the 40-acre parcel area, but does show a trail running along the Yakima Rive to the west (Figure 4).
- The 1917 USGS Pasco Quadrangle showed no activity in the parcel.
- 1934 and 1943 Benton County Metzker maps indicated no development on the parcel, which was owned by Benton County (Figure 5).

- The 1943 Hanford Real Estate Map showed that the parcel was part of lands owned by Benton County, identified as J-633, which was purchased by the U.S. Government for Hanford.

Figure 4. Segment of the 1865 General Land Office map showing location of 40-acres parcel.

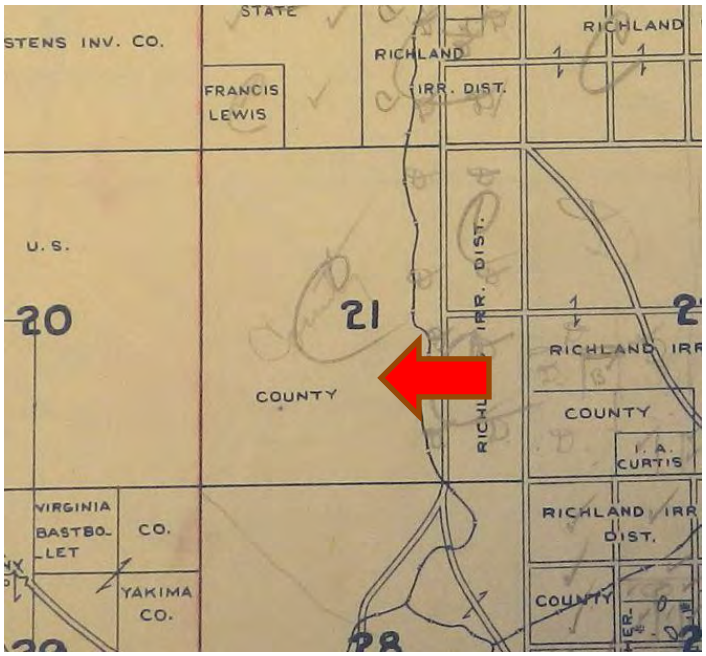

Figure 5. Segment of the 1943 Benton County map showing location of 40-acre parcel.

Knowledge of Tribal Traditional Resources

The Confederated Tribes of the Umatilla Indian Tribes (CTUIR) was contacted about possible traditional uses of the 40-acre parcel. The response indicated that there was a Historic Property of Religious or Cultural Significance within one mile, but potential impacts would need to wait until more specifics were available (Shea 2016).

Northwest Anthropology LLC (NWA) has been working with the Wanapum of Priest Rapids for several years to identify traditional cultural places (TCP). Although we did not talk to Wanapum specifically about this parcel, we know there is nothing in the documentary record to suggest any Wanapum TCP at this location. Because the native habitat was altered when the area was farmed, traditional plant resources no longer exist on the parcel. There is a good viewscape of Rattlesnake Mountain (*Laalik*) to the west (Figure 6). When consultation with tribes occurs as the project moves forward, there could be concern about impacts to this viewscape.

Figure 6. View of 40-acre parcel, looking northwest at the snow-shrouded, sacred Rattlesnake Mountain.

Archaeological Survey Results

Following DAHP guidelines on locations classified as Moderate Risk, a ten-meter pedestrian survey was conducted. NWA staff members Amanda Cervantes, Tyus Squeochs, and field supervisor James Knobbs assembled at the corner of 1st Street and Polar Way in Richland, WA at 9:30 am on February 22, 2017. The weather was dry and clear. Representatives from the City of Richland Public Works, in response to an 811 utility inquiry, advised NWA to operate at least 40 feet from any extant road in the survey and shovel testing areas. Three NWA staff spread out along the northern edge of the property 40 feet south of 1st Street spaced 10 meters apart, and starting from 40 feet plus 5 meters west from Polar Way. NWA staff surveyed in north-south transects using a Silva model 420 magnetic compass set with declination of 14º, 53' E to maintain direction. Survey transects are shown in Figure 7.

Each surveyor scanned the ground approximately 5 meters on either side of their path. Surveyors walked as straight as the ground cover would allow while maintaining a 10 meter spacing. Knobbs, the center surveyor on each set of transects, was charged with maintaining direction. Towards the center of the site, there appeared to be some sort of electromagnetic interference, as the compass showed wide variance with the actual cardinal directions (as determined by map).

Ground visibility is very poor (Figure 8). Approximately 95% of the area is heavily covered with invasive species of plants, primarily cheat grass (*Bromus tectorum*), and Russian thistle (*Salsola tragus*). There are many "blowouts" where no plants are presently growing, which were found to be areas where geotechnical exploration occurred in the recent past.

The entire property was surveyed in this method, with the results presented below.

Only two cultural features were observed during the survey: the pivot platform from the modern crop circle (Figure 9), and a small cairn of modern debris and natural rock in the northwest quarter of the property (Figure 10). Surveyors found a lot of modern garbage scattered across the property, most likely blown in from the Horn Rapids RV resort on the southwest border and the nearby high traffic on Kingsgate Way.

Figure 7. Map of the 40-acre parcel (outlined in red) showing survey transects. The green line is James Knobbs (JK) survey path on 30 meter centers (one surveyor on either side).

Figure 8. Common density of cheatgrass encountered on the survey property. Swiss Army knife used for scale.

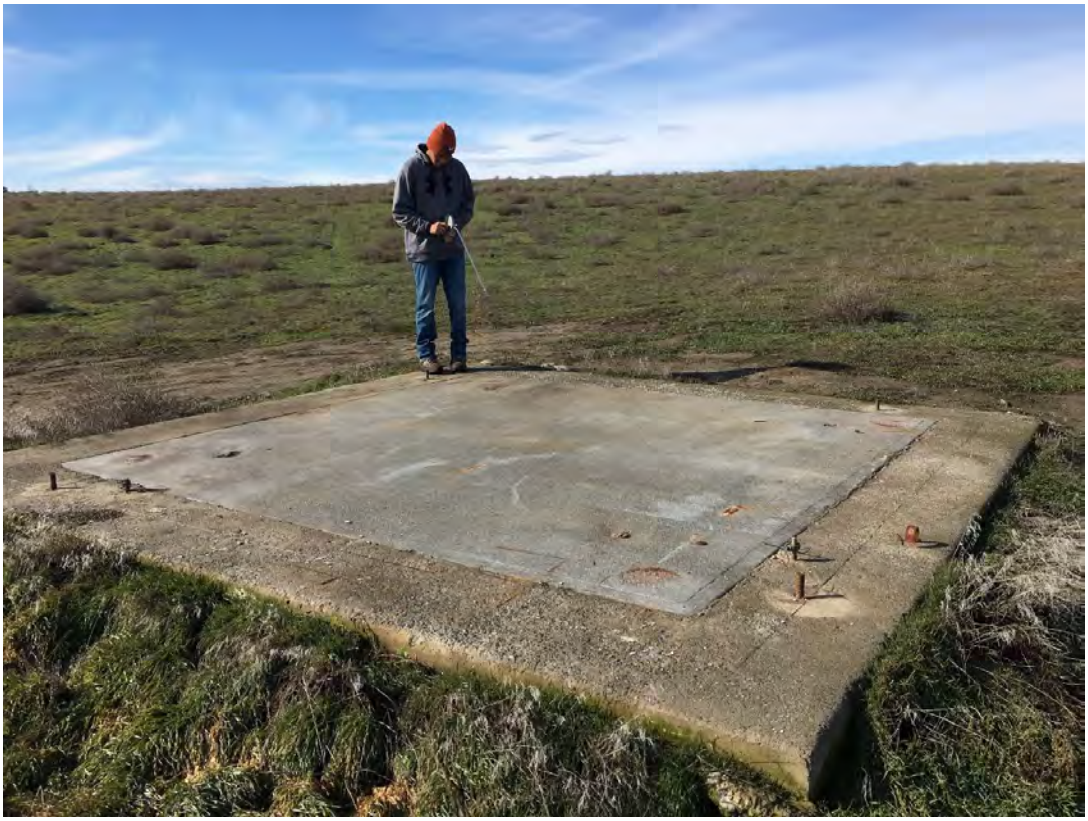

Figure 9. Concrete pivot foundation in the 40-acre parcel property.

Figure 10. Cairn made up of modern debris (concrete, slate, brick and asphalt), and native rocks (basalt, and calcium carbonate crusted cobbles). NWA staff member Tyus Squeochs for scale.

Subsurface Results

NWA placed 40 shovel test probes in order to assess the subsurface conditions in the project area below the plow-zone. The shovel tests were spaced based on the judgement of NWA field supervisor James Knobbs with the intent to sample a variety of microenvironments. The micro-landforms included small rises, saddles, gullies, and slopes, the micro-biomes included high and low density *Salsola tragus* areas, high and low density *Bromus tectorum* areas, and sandy blowout areas, which turned out to be areas where geotechnical drilling had recently occurred.

The procedures and standards used in the shovel testing are listed below:

1. Sample locations for the two areas slated for construction are shown in Figure 11.
2. Using a Trimble Outdoors mapping app on an iPhone 6s, the UTM coordinates of the sample location were recorded in the app, on a shovel test form, and on a photo-documentation board.
3. A 1/4" shaker screen was set up on a tarp to capture sediment and staffed by an NWA employee in close proximity to the sample location.

4. Using a round nosed shovel, an NWA staff member would dig an approximately 35 cm diameter hole in arbitrary 10 cm levels, either putting the sediment directly into the shaker screen, a bucket, or a 1/8" hand screen (Figure 12).

5. The sediment was sifted through the 1/4 or 1/8 inch mesh screen, with cultural material being pursued both visually and tactilely.

6. Upon termination of the hole, either by depth of 1 meter or more, or obstruction, the hole was photo-documented (Figure 13), documented on the STP form, measured for changes in stratigraphy, soil conditions and color, and examined for cultural material in the side-walls.

7. The hole was then back-filled with the sediment remaining on the tarp, a new STP location was selected, and the process was repeated.

Figure 11. Topographic map showing the location of the 40-acre-parcel and the shovel test pits excavated. The possible location of the readiness center area is outlined in black on the left; the parking lot area outlined in black on the right. Note the relatively steep slope in between the two areas.

Figure 12. NWA Crew beginning STP 21 in an area that turned out to be the location of a recent geotechnical exploration test.

Figure 13. STP 21 photo-documentation: photo on left showing the documentation recorded on the photo-documentation board, photo on the right showing the basic stratigraphy of the STP. Note the bentonite fragments in the bottom of the STP.

Of the 40 shovel tests completed, only two contained cultural material. The first, STP 17, was terminated at 90 cm after encountering an unidentified concrete structure whose size and nature could not be determined in the context of a shovel test, though it appeared to be a modern drain pipe. This was located very near the modern cairn, but association could not be established.

The other positive shovel test (STP 21) encountered wet clay fragments below 50 cm, which were interpreted to be Bentonite clay, a common filler used to plug geotechnical drilling holes. All other STPs were negative for cultural materials, the results are tabulated in Tables 2 and 3.

Three types of soil horizons were observed in the shovel tests, and these were coded A, B, and C. The A soil horizon was typically measured from the surface down to between 15 and 40 cm. The A horizon is characterized as root laden, medium brown fine to medium sand, typically with < 1% small rounded to sub-angular gravels. The color of this horizon was measured using a Munsell chart as 2.5Y5/2, but all samples were damp, so color may change as the area dries out. A typical soil column is illustrated in Figure 14.

The B soil horizon was typically measured from the surface down to between 15 and 40 cm. The A horizon is characterized as sterile, grayish medium sand, typically with < 1% small rounded to sub-angular gravels. The color of this horizon was measured using a Munsell chart as 10YR6/4, but all samples were damp, so color may change as the area dries out.

The C soil horizon was only observed in STP 40 below a depth of 72 cm. The C horizon is characterized as sterile, brownish medium-fine sand, with < 1% small rounded to sub-angular gravels. The color of this horizon was measured using a Munsell chart as 10YR4/4, but all samples were damp, so color may change as the area dries out. This was the only STP that showed evidence of vertebrate life, in the form of a small rodent femur.

Table 2. Shovel Test Locations Selected for Sampling, Cultural Material Occurrence, and Rationale for Selection

STP #[a]	11T Easting (meters)[b]	Northing (meters)[b]	P or N[c]	Depth (cm)[d]	Soil Change[e]	Test Rationale (landform/surface veg)
1	0321883	5133301	N	100	40	Gully/cheatgrass
2	0321957	5133320	N	100	16, 53	Gully/sandy
3	0321991	5133361	N	100	38	Saddle/cheatgrass
4	0321962	5133400	N	100	32	Rise/cheatgrass
5	0321940	5133398	N	100	34	Gully/cheatgrass
6	0321921	5133395	N	100	30	Slope/ cheatgrass
7	0321922	5133388	N	100	25	Rise/cheatgrass
8	0321908	5133353	N	100	35	Saddle, sparse veg
9	0321896	5133297	N	100	27	Rise/cheatgrass
10	0321898	5133315	N	100	28	Rise/tumbleweed
11	0321899	5133338	N	100	30	Slope/cheatgrass
12	0321932	5133430	N	100	30	Saddle/cheatgrass

13	0321965	5133434	N	100	22	Bench/sparse veg
14	0321904	5133453	N	100	28	Slope/tumbleweed
15	0321911	5133502	N	100	28	Saddle/tumbleweed
16	0321999	5133451	N	100	34	Gully/sparse veg
17	0321977	5133519	P	90	31	Rise/tumbleweed/cairn
18	0322028	5133470	N	110	26	Rise/tumbleweed
19	0322031	5133320	N	110	13, 42	Slope/sandy
20	0322058	5133412	N	110	36	Slope/cheatgrass
21	0322063	5133468	P	110	10, 40	Slope/sandy
22	0322033	5133533	N	100	27	Slope/cheatgrass
23	0322017	5133550	N	100	24	Rise/cheatgrass
24	0322012	5133607	N	100	34	Gully/cheatgrass
25	0321920	5133601	N	100	36	Gully/cheatgrass
26	0321938	5133539	N	100	34	Slope/tumbleweed
27	0321944	5133501	N	100	30	Slope/tumbleweed
28	0321945	5133460	N	100	32	Bench/tumbleweed
29	0322237	5133588	N	100	23	Slope/tumbleweed
30	0322179	5133433	N	106	26	Bench/cheatgrass
31	0322216	5133293	N	100	35	Bench/sparse veg
32	0322251	5133363	N	100	30	Gully/sparse veg
33	0322152	5133578	N	100	35	Slope/tumbleweed
34	0322159	5133534	N	102	22	Slope/cheatgrass
35	0322188	5133511	N	111	26	Gully/sandy
36	0322240	5133440	N	106	29	Bench/cheatgrass
37	0322186	5133368	N	100	32	Slope/cheatgrass
38	0322195	5133288	N	109	36	Slope/sparse veg
39	0322204	5133348	N	102	45	Bench/cheatgrass
40	0322257	5133539	N	108	23, 72	Gully/sparse veg

[a]STP = shovel test pit number; [b]UTM locations; [c] P = positive for cultural material; N = negative for cultural material; [d] depth where change occurs from A to B or A to B to C in cm.

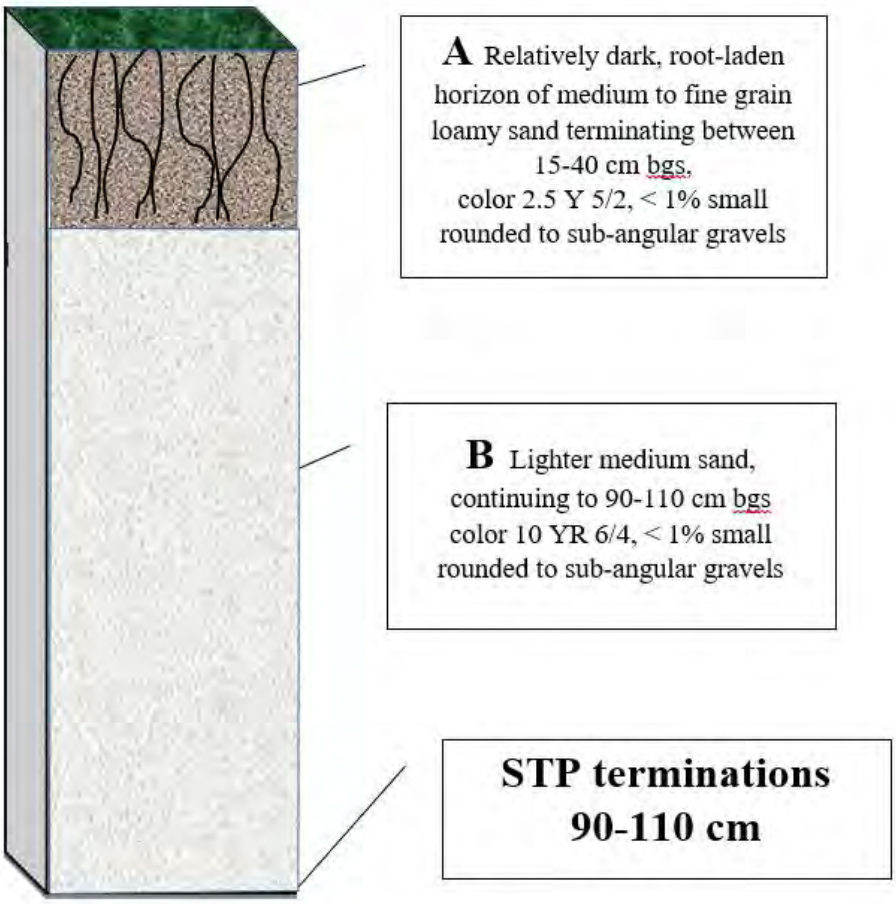

Figure 14. Typical soil column observed in shovel testing at 40-acre parcel.

Assessment

Based upon the forgoing analyses, our assessment is that there is a low probability that significant archaeological resources are located on the parcel. In the event resources are discovered, assuming proper consultations are completed prior to construction, resolution should be straightforward. The location does not fit models for major village locations or major cemetery locations, two scenarios that could result in complex mitigation.

As the land purchase and plans for construction move forward, the Army National Guard will begin National Environmental Policy Act and National Historic Preservation Act consultations with the Washington Department of Archaeology and Historic Preservation and area Tribes. This report will assist in providing information concerning the known cultural resources and the potential for unknown resources to be discovered. The parties may believe that addition investigation is needed or that there should be monitoring during construction. It is the recommendation of NWA LLC that the potential to encounter National Register-eligible archaeological resources within the 40-acre parcel is remote.

Table 3. Cultural Resources observed during pedestrian survey and shovel testing.

STP or Photo #	Length	Width	Height	Description
IMG_4106 (Figure 9)	4m	4m	15cm	Pivot foundation. Appears modern, 1954 aerial photo shows no pivot farming in the area. Most of the development of pivot irrigation occurred after 1970 (Muckleston, Highsmith 1978), leading NWA to infer that this pivot does not meet federal standards for historic properties.
IMG_4107 (Figure 10)	2.5m	2.5m	.5m	Cairn made up of modern debris (concrete, slate, brick and asphalt), and native rocks (basalt, and calcium carbonate crusted cobbles). NWA interprets the cairn to be modern based on the inclusion of clearly modern debris in the form of some concrete curbing, and slate as well as carbonate crusted cobbles that most likely came from off-site.
STP 17	Unknown			Unknown concrete structure, probably a modern drain pipe. NWA was not able to make a definitive determination due to the depth of the concrete and limitations of shovel excavation. Observed at 90 cm bgs at the termination of the STP.
STP 21	Unknown			Clay, most likely bentonite fill from a recent geotechnical investigation of the area. Observed from 50 cm bgs to the termination of the STP.

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Appendix A

Results of WISAARD Search

Archaeology

Comments	Date Recorded	Smithsonian Number	Listing Status	Archaeology ID	Field Temporarty Number(s)	Resource ID	Site Type Name	Site Name
HISTORIC REFUSE SCATTER, 1935-1945, 90 X 20M	11/24/1998 12:00:00 AM	BN01110	Potentially Eligible	1320	BN01110	631581	Historic Debris Scatter/Concentr	
HISTORIC FARMSTEAD, 37 X18M, EARLY 1900'S	11/24/1998 12:00:00 AM	BN01111	Potentially Eligible	1321	BN01111	631582	Historic Agriculture; Historic Homestead	
HISTORIC REFUSE DUMP, 40 X 15M, EARLY 1900'S	11/24/1998 12:00:00 AM	BN01113	Potentially Eligible	1323	BN01113	631583	Historic Debris Scatter/Concentr	
HISTORIC REFUSE SCATTER, 3 X 3M, EARLY 1900'S	4/4/1998 12:00:00 AM	BN01114	Potentially Eligible	1324	BN01114	631584	Historic Debris Scatter/Concentr	
HISTORIC REFUSE SCATTER, 80 X 30M, EARLY 1900'S	2/28/1997 12:00:00 AM	BN01122	Potentially Eligible	1332	BN01122	631592	Historic Debris Scatter/Concentr	
RICHLAND IRRIGATION CANAL, HISTORIC CANAL, REFUSE SCATTER, CA 1902-1909, SEGMENTS 15 X 1400M, 165 X 40M, 60 X 180M	9/27/1994 12:00:00 AM	BN01125	Determined Eligible	1335	BN01125	631595	Historic Agriculture; Historic Debris Scatter/Concentr	
HISTORIC REFUSE SCATTER, 10 X 10M	3/26/1998 12:00:00 AM	BN01419	Survey/Inventor	1613	BN01419	631873	Historic Debris Scatter/Concentr	

Comments	Date Recorded	Smithsonian Number	Listing Status	Archaeology ID	Field Temporarty Number(s)	Resource ID	Site Type Name	Site Name
HISTORIC REFUSE SCATTER, BOTTLES, CANS, CAR PARTS, 1917-1930'S, 15 X 10M	3/25/1998 12:00:00 AM	BN01420	Potentially Eligible	1614	BN01420	631874	Historic Debris Scatter/Concentı Historic Object(s)	
PRE-CONTACT LITHIC MATERIAL, GROUND STONE ISOLATE.	2/29/2008 12:00:00 AM	BN01475	Survey/Inventor	1669	BN01475	631927	Pre Contact Isolate; Pre Contact Lithic Material	
HISTORIC REFUSE, CULVERTS, CONCRETE BOX, IRRIGATION DITCH, 1000 X 150M, CA. 1948	3/23/1998 12:00:00 AM	BN01681	Potentially Eligible	27270	BN01681	657114	Historic Agriculture; Historic Debris Scatter/Concentı	

Property

Property ID	Has Image(s)?	Resource ID	County	Common Name	Address	Historic Name
573892	No	521169	Benton		2898 RIVERBEND DR, RICHLAND, WA 99354	
574459	No	521736	Benton		2947 CROSSWATER LOOP, RICHLAND, WA 99354	

Cultural Survey

Author	County	Title	NADB	Report Date	Document Type
Chatters, James C.	Benton	Letter to Gene Post Regarding Preliminary Report on the Cultural Resources File Search and Survey of the Precision Cast Parts Property	1342318	2/6/1997 12:00:00 AM	Survey Report
Sharley, Ann	Benton	Cultural Resources Survey for the Washington State Department of Transportation's SR 240, Beloit Road to Kingsgate Way Project	1350517	9/1/2007 12:00:00 AM	Survey Report
Miller, Carey L.	Benton	Archaeological Survey for the Proposed Babe Ruth Baseball Complex, Richland	1351107	3/24/2008 12:00:00 AM	Survey Report
Chobot, Katherine	Benton	Cultural Resources Assessment and Monitoring for the Port of Benton Transload Facility Project	1351223	4/1/2008 12:00:00 AM	Survey Report
Arthur, Ed	Benton	Cultural Resources Survey for the Horn Rapids Stormwater Retrofit, Richland	1352449	2/4/2009 12:00:00 AM	Survey Report
Arthur, Ed	Benton	Cultural Resource Survey for the Horn Rapids .75 Mgal Reservoir, Richland	1352450	7/10/2009 12:00:00 AM	Survey Report
Dampf, Steven	Benton	Cultural Resources Assessment of AREVA NP Richland Fuel Fabrication Facility	1352543	3/1/2009 12:00:00 AM	Survey Report
Arthur, Ed	Benton	Cultural Resources Survey for the Robertson Drive Extension, Richland	1353206	7/10/2009 12:00:00 AM	Survey Report
Arthur, Ed	Benton	Cultural Resources Survey for the Logston Boulevard Extension, Richland	1353207	7/10/2009 12:00:00 AM	Survey Report

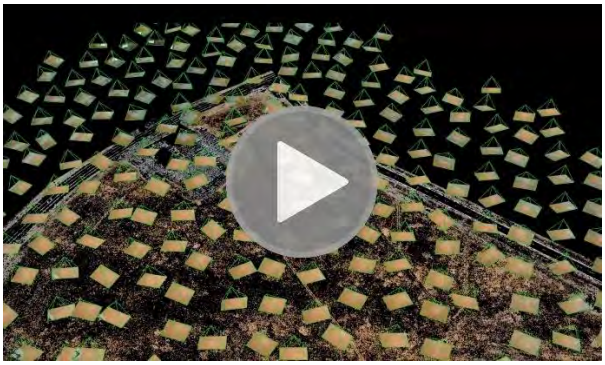
Author	County	Title	NADB	Report Date	Document Type
Arthur, Ed	Benton	Cultural Resources Survey for the First Street Construction, Kingsgate Way to Logston Boulevard, Richland	1353208	7/10/2009 12:00:00 AM	Survey Report
Mishkar, Larry	Benton	Aggregate Quarry Cultural Resources Assessment, Richland	1681170	11/1/2010 12:00:00 AM	Survey Report

Biological Survey Report

Tri-Cities Readiness Center
Richland, Washington

Prepared for:
State of Washington Military Department
Building 36 Quartermaster Road
Camp Murray, WA 98430-5050

June 26, 2017
PBS Project No. 64395.000



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1 INTRODUCTION

The Washington Military Department, Army National Guard proposes to construct a 40,000 square foot, single story readiness center with parking areas, training areas, access driveways, and utilities on a site near the intersection of 1st Street and Polar Way in Richland, Benton County, Washington.

A field investigation of the subject property was conducted to map vegetation communities, assess habitat conditions, note wildlife signs (including migratory birds), and describe general site conditions. Invasive vegetative species presence was also noted. This report on the vegetation, habitat and wildlife assessment was conducted to determine potential future permitting requirements for development of the project.

2 PROPERTY DESCRIPTION

2.1 Location

The project site is located on 40 acres of a 193-acre parcel of former agricultural land owned by the City of Richland, between the Columbia and Yakima rivers, in northwest Richland, Benton County, Washington (Figure 1). The parcel is located in the SW quarter of the SE quarter of Township 10 N, Range 28 E, Section 21, Willamette Meridian (Richland 7.5' USGS quadrangle, 1992). The project is located on a portion of Benton County Parcel 121084000006003. Specifically, the area of survey is focused on a subset of the land bounded by 1st Street to the north, Polar Way to the east, Logan Street to the south, and a cluster of tax parcels along Kingsgate Way to the west in a rapidly expanding industrial section, just off Highway 240 and Kingsgate Way. The site is bordered by an RV park on the south, and several private parcels of land on the west (Figure 2).

2.2 Site Information

The site lies within the semi-arid shrub-steppe region Pasco Basin of the Columbia Plateaus Physiographic Province. This region is primarily a mixture of grazing land and cropland (USDA 1971). The proposed Readiness Center property is located in an area previously used for agriculture in the Horn Rapids area of Richland, Washington (NWA 2017). The site sits on a gentle to moderate slope that descends to the east. The western portion of the project area is very slightly rounded, sloping to east and west, but then falls off towards the east, with a slight swale to the northeast. The elevation across the site varies from approximately 426 feet above mean sea level (amsl) in the southwest corner of the site to approximately 383 feet amsl near the northeast corner (NRCS 2017).

Field observations identified one concrete block near the center of the site; this was center of the pivot irrigation system used during active agriculture operations. A shallow swale led from slightly south of the concrete block generally towards the northeast corner. New roads to the north and east have been recently constructed.

The National Wetlands Inventory maps one stream on the site. The feature is classified as a riverine wetland with an unknown hydrology permanence and an unknown type of bottom substrate (USFWS 2017, Richland 2017). No wetlands, ditches or streams were observed on the site (Figure 3). One roadside ditch was observed along the east edge of the parcel that was located within the Polar Way right-of-way. The area was investigated for wetland characteristics; the soil was reported to be somewhat moist but the area did not satisfy wetland characteristics. A west to east trending stabilized sand dune is located within the 40-acre parcel; it is the product of the strong westerly winds that dominate the landscape in this area (NWA 2017).

2.3 Disturbance History

The entire parcel has been disturbed by modern agricultural efforts and has been plowed and planted in wheat and corn for decades. Prior to farming, the stabilized sand dunes provided good habitat for a wide variety of plants and animal species. The parcel has laid fallow during the past few years (NWA 2017).

3 METHODOLOGY

PBS has prepared this report based on the following information:

- **Site Visit:** Katharine Lee, a Senior Scientist for PBS, conducted a site visit on June 7, 2017. The site visit consisted of walking the property and identifying vegetation communities, plant species, and wildlife sign, as well as making general observations on habitat conditions and site disturbance.
- **Wildlife Habitat Evaluation:** Kimberly Degutis, a Project Manager with PBS, provided an analysis of habitat conditions.
- **WDFW Priority Habitats and Species:** The WDFW on-line habitat and species website was consulted for information on priority habitats and species at or in close proximity to the property.
- **Literature Review:** Information on species identification and habitat requirements was obtained from multiple sources on the internet.
- **Aerial Photographs and Maps:** A number of mapping sources were consulted for historic aerials, topography, soils, habitat use, and other information.
- **Consultation with WDFW and USFWS local biologist:** Michael Ritter, a Washington State Department of Fish & Wildlife (WDFW) Area Habitat Biologist in Pasco, WA, was consulted to determine if any State of Washington sensitive plant or animal species had been or are located on the project site. Ryan McReynolds, a US Fish and Wildlife Service (USFWS) Consultation & Conservation officer in Lacey, WA was consulted regarding potential priority species use at the property or in the immediate vicinity.

4 NATURAL RESOURCE INVENTORY

4.1 Vegetation Communities

The parcel is located in a region that previously supported a semi-arid shrub-steppe community type (USDA 1971). Shrub-steppe is defined as a vegetation community consisting of one or more layers of perennial grass with a discontinuous overstory layer of shrubs. In the Mid-Columbia Region, intact shrub-steppe is dominated by perennial grasses that include bluebunch wheatgrass, Sandberg's bluegrass, Idaho fescue, needle and thread grass, and Thurber's needlegrass (WHNIS 2012). Big sagebrush is the dominant shrub with lesser amounts of rabbitbrush, hopsage, bitterbrush and buckwheat (USDA 1971). Much of the original shrub-steppe in the Tri-Cities area has been converted to agriculture or development. Grazing and other disturbance on the remaining shrub-steppe in the region has resulted in a dramatic reduction in perennial bunchgrasses and native forbs with a corresponding increase in the non-native annual cheatgrass.

The shrub-steppe community on this property was replaced with agricultural fields decades ago (NWA 2017). When agriculture was discontinued two years ago, the site was taken over by the introduced annual cheat grass. Cheat grass has over 90 percent cover across nearly the entire site except for the relatively newly graded side slopes for the roads to the north and east, where there were still areas of bare soil. Old corn stalks were present throughout the site, though mostly deteriorated. Only a few native plants are present and these include scattered individuals of big sagebrush, a few rabbitbrush, and possibly a few native grasses. Other species identified on site include tumbleweed, tall tumblemustard, burning brush, and prickly lettuce, all of which are introduced species that colonize disturbed areas.

Table 1 – Plant species observed on the project site

Scientific Name	Common Name	Native or Introduced
Bromus tectorum	Cheatgrass	I
Calamagrostis sp.	Reed grass	?
Ericameria nauseosa	Gray or rubber rabbitbrush	N
Kochia scoparia	Burning brush	I
Lactuca serriola	Prickly lettuce	I
Artemesia tridentata	Big sagebrush	N
Salsola tragus	Tumbleweed	I
Sisymbrium altissimum	Tall tumblemustard	I

Burning brush is listed on both the Washington State and Benton County Class B Noxious Weed lists. Class B noxious weeds are nonnative species whose distribution is limited to portions of Washington State (WAC 16-750-011, Richland 2013). In regions where a Class B species is already abundant, control is decided at the local level. Containment of these weeds is the primary goal so that they do not spread into un-infested regions. Class B noxious weeds can be designated for mandatory control.

4.1.1 Priority Plant Species

The Washington Natural Heritage Information System lists 27 rare plants known to occur within the vicinity of the project area (WHNIS 2017). Suitable habitat is not present on the site for any these species.

Table 2 – Priority Plant Species in Benton County, WA

Common Name	Scientific Name	Federal Status	State Status	Potentially Occurring on the Project Site?
Great Basin gilia	*Aliciella leptomeria*	--	Threatened	N
grand redstem	*Ammannia robusta*	--	Threatened	N
Columbia milk-vetch	*Astragalus columbianus*	--	Sensitive	N
pauper milk-vetch	*Astragalus misellus var. pauper*	--	Sensitive	N
rosy pussypaws	*Calyptridium roseum*	--	Threatened	N
gray cryptantha	*Cryptantha leucophaea*	--	Sensitive	N
miner's candle	*Cryptantha scoparia*	--	Sensitive	N
Snake River cryptantha	*Cryptantha spiculifera*	--	Sensitive	N
desert dodder	*Cuscuta denticulata*	--	Threatened	N
small-flower evening-primrose	*Eremothera minor*	--	Sensitive	N
dwarf evening-primrose	*Eremothera pygmaea*	--	Sensitive	N
Piper's daisy	*Erigeron piperianus*	--	Sensitive	N
Umtanum desert buckwheat	*Eriogonum codium*	Threatened	Endangered	N
Suksdorf's monkeyflower	*Erythranthe suksdorfii*	--	Sensitive	N

Common Name	Scientific Name	Federal Status	State Status	Potentially Occurring on the Project Site?
Canadian St. John's-wort	*Hypericum majus*	--	Sensitive	N
halfchaff awned sedge	*Lipocarpha aristulata*	--	Threatened	N
spreading pygmyleaf	*Loeflingia squarrosa*	--	Threatened	N
Hoover's desert-parsley	*Lomatium tuberosum*	--	Sensitive	N
red poverty-weed	*Micromonolepis pusilla*	--	Threatened	N
Nuttall's sandwort	*Minuartia nuttallii var. fragilis*	--	Threatened	N
mousetail	*Myosurus clavicaulis*	--	Sensitive	N
coyote tobacco	*Nicotiana attenuata*	--	Sensitive	N
cespitose evening-primrose	*Oenothera cespitosa ssp. cespitosa*	--	Sensitive	N
persistentsepal yellowcress	*Rorippa columbiae*	--	Threatened	N
lowland toothcup	*Rotala ramosior*	--	Threatened	N
woven-spore lichen	*Texosporium sancti-jacobi*	--	Threatened	N

Both the WDFW and the USFWS were contacted by the Washington Military Department to determine the likelihood of any of the above species occurring on the project site. See Appendix: Correspondence for a copy of the communication.

- Michael Ritter, the WDFW Habitat Biologist for the Pasco area, confirmed that no sensitive plant species are mapped on the project site (personal communication, April 4, 2017).
- Ryan McReynolds, the USFWS Consultation and Conservation Planner, confirmed that no sensitive plant species are mapped on the project site (personal communication, February 3, 2017)

None of the above listed species occur on or have suitable habitat on the project site; it is unlikely that any of these species would be affected by development of the proposed Readiness Center.

4.2 Wildlife and Wildlife Habitat

The project site is located within an area that was formerly farmed and the land constantly disturbed. While the greater Hanford area supports a biologically diverse shrub-steppe plant community that has been relatively protected from disturbance, the entire 40-acre project site has been disturbed by modern agricultural efforts (NWA 2017). Prior to farming, the stabilized sand dunes provided good habitat for a wide variety of animal species. The historic wildlife population was small. There are few pockets of undisturbed habitat that contain shrubs or trees on or near the parcel; however, the project site itself is highly disturbed and generally clear of native vegetation.

Some of the major wildlife species in this area include coyote, hawks, eagles, prairie falcon, pheasant, gray partridge, chukar, California quail, and burrowing owl (USDA 2006). Good numbers of waterfowl, deer, sage grouse, and furbearers were to be found only along streams and around springs and potholes (USDA, 1971). Because of the degraded plant communities and the proximity to developed areas, wildlife that use the area tend to be more generalist species and those more tolerant of human activity.

Field survey of the project site identified a few small burrows, mostly along the north and east edges of the parcel in the disturbed road banks, but also a few burrows in the center of the site in areas where there is bare soil and a few other plants (tumbleweed or tumble mustard). The burrow entrances and immediate areas were inspected for signs of burrowing owls (e.g. – small bones); no evidence of owl activity was observed. The only wildlife observed were some swallows that likely originated from a nesting area off site.

4.2.1 Priority Wildlife and Wildlife Habitat

WDFW's Priority Habitat Species mapper indicates one species with the potential occurrence on the site (Ferruginous hawk) and another species within close vicinity of the project site (burrowing owls) (WDFW 2017) (Figure 4). Table 3 summarizes the priority wildlife species and habitat requirements for each species (USFWS 2013). Two species, burrowing owl and Ferruginous hawk, have the potential to occur on the project site.

Table 3 – Priority wildlife species potentially on the project site

Scientific Name	Common Name	Federal Status	State Status	Habitat	Habitat Present?	Potential to Occur
Athene cunicularia	Burrowing owl	Concern	Candidate	Shrub steppe areas with low ground cover, small animal burrows for nesting	Y	Y
Coccyzus americanus	Yellow billed cuckoo	Threatened	N/A	Large continuous riparian zones and open lowland deciduous woodlands with clearings and shrubby vegetation, especially those near rivers and streams	N	N
Canis lupus	Gray wolf	Endangered	Endangered	Forested areas with relatively flat, open spaces such as river valleys and basins; areas with limited human contact	N	N
Brachylagus idahoensis	Columbia Basin pygmy rabbit	Endangered	Endangered	Areas of deep loamy soils with sagebrush dominant vegetation	N	N
Salvelinus confluentus	Bull trout	Threatened	Candidate	Cold, clean, complex and connected streams (headwater regions)	N	N
Buteo regalis	Ferruginous hawk	Concern	Threatened	Wide open undisturbed landscapes with native bunchgrasses; not tolerant of development; winter in agricultural areas	Y	Y

4.2.1.1 Burrowing Owls

Burrowing Owls (Fed Species of Concern, WA State Candidate species) have been found in locations throughout the Tri-Cities and are reported to be in the vicinity of the project site. WDFW does not show presence on the 40-acre project (WDFW 2017). The owls prefer open areas with low ground cover and feed off large insects and small mammals such as moles and mice. The burrowing owl will use the burrows of ground squirrels, gophers and other ground dwelling species as well as other natural and man-made cavities for nesting. Few small mammal burrows were observed on the project site, so potential burrow sites could be limiting. Nesting season begins in late March or April (Lewis, 2015) and lasts approximately 3 months (Ehrlich et al 1988).

4.2.1.2 Ferruginous Hawks

Ferruginous Hawk is the only state threatened wildlife species with a potential presence on the project site. WDFW reports potential breeding habitat and occurrences for the Ferruginous Hawk in the general area (at the township level). Ferruginous hawks prefer wide open, undisturbed landscapes and are not very tolerant of urban or suburban development (WDFW 2012). The primary prey species for the Ferruginous hawk include jackrabbits and gophers. Site observations noted few small burrows within the 40-acre parcel, with none the size of suitable for jackrabbits or gophers. In addition, WDFW notes that the proliferation of cheatgrass in disturbed areas has contributed to overall declines in the jackrabbit population (WDFW 2012). Significant loss of hares in Washington State and dietary shifts to insects and smaller mammals suggest that the hawks may prefer more undisturbed hunting grounds. The project site, as currently used, provides poor hunting opportunities for hawks. Ferruginous hawks are known to travel five or ten miles in search of prey. Larger agricultural parcels within 5 to ten miles distance provide a more robust source of prey, making it unlikely that the project site is utilized as a hunting ground for Ferruginous hawks.

None of the above listed species are known to occur on the project site and there is no suitable habitat present due to the past agricultural activities; it is unlikely that any of these species would be affected by development of the proposed Readiness Center.

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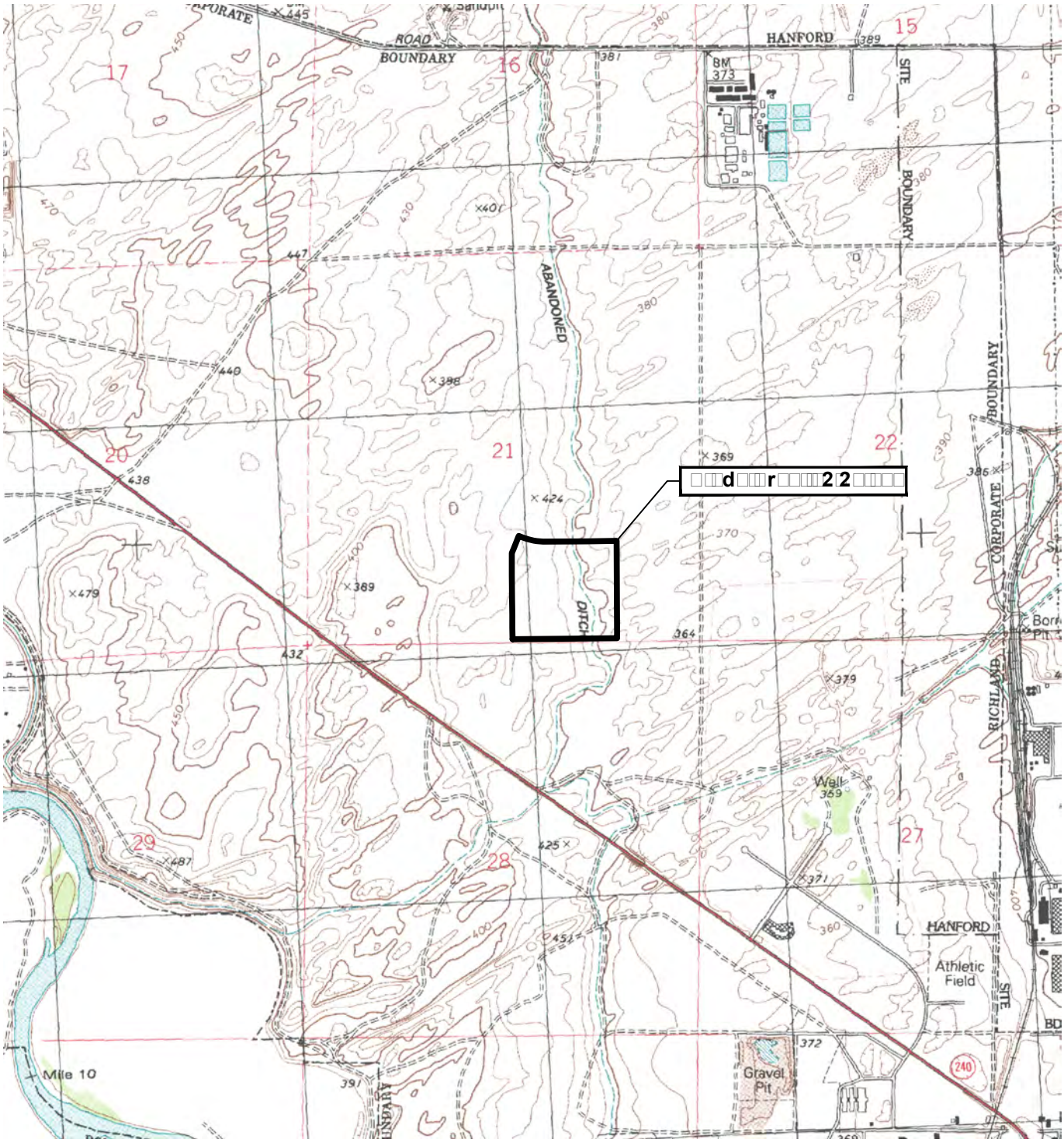
FIGURES



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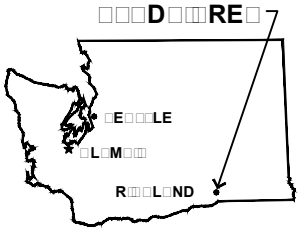

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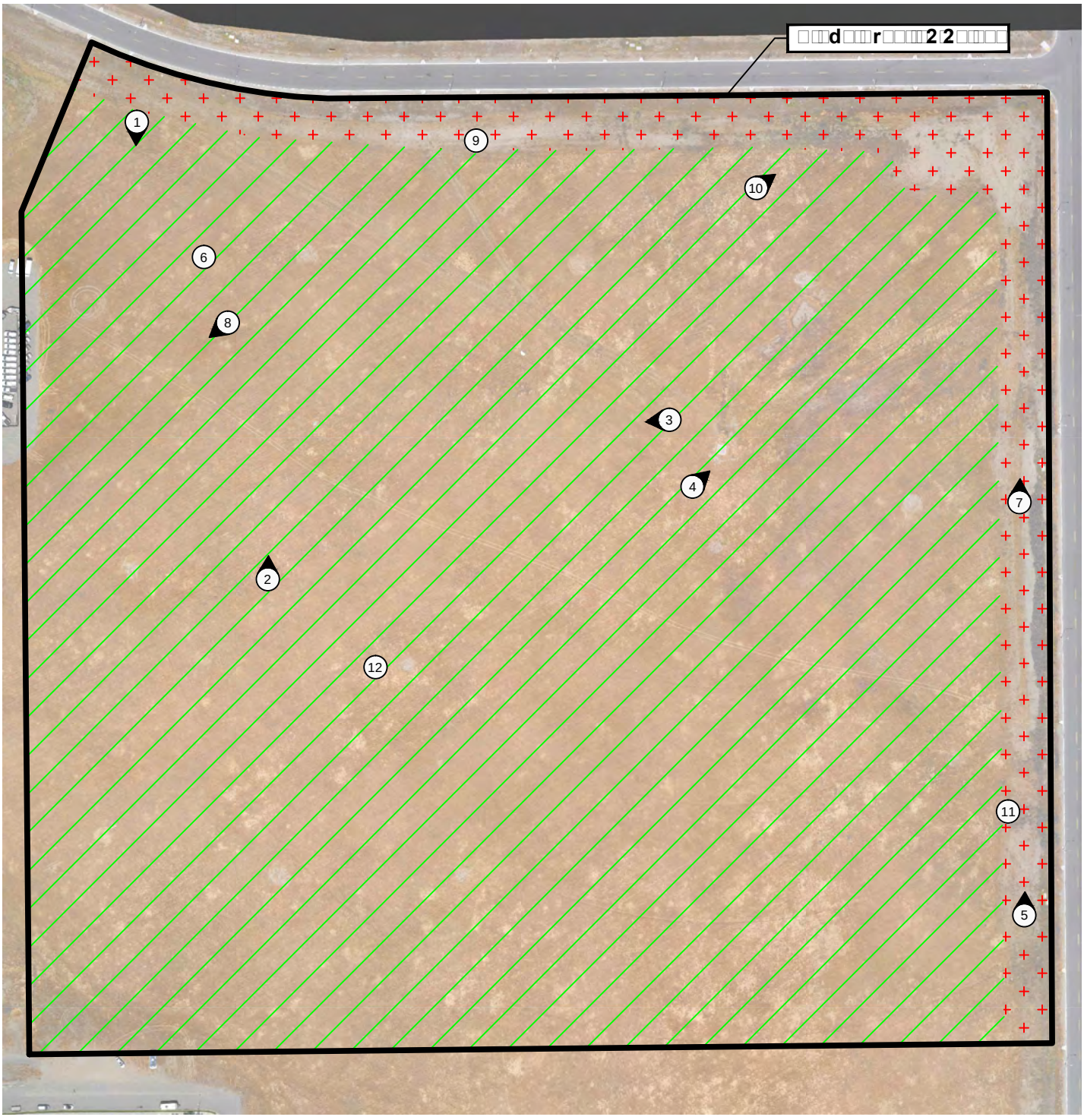

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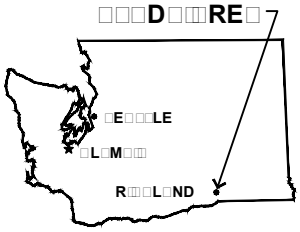

Legend

Bromus tectorum dominated grassland

Areas disturbed during road construction

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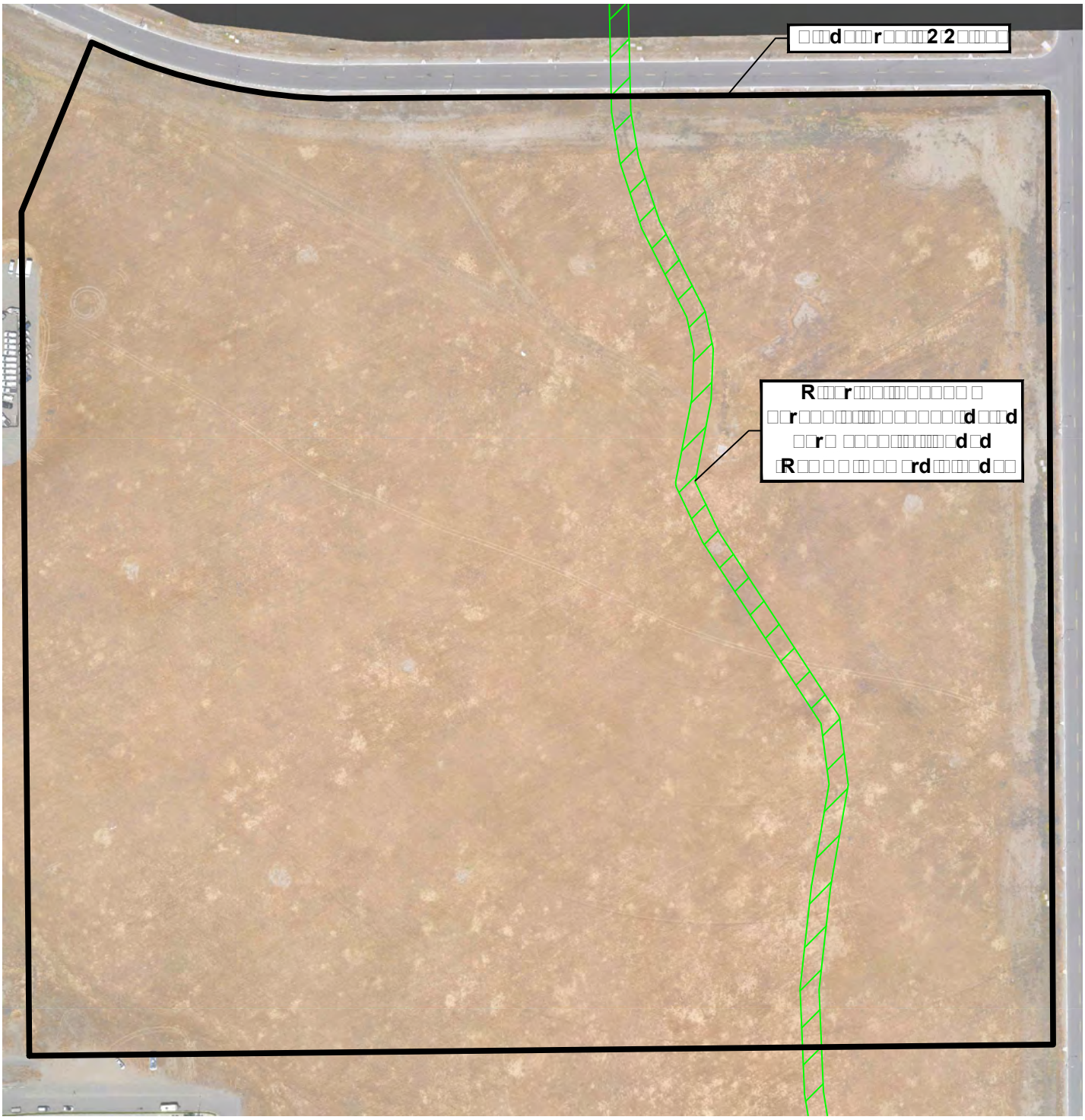

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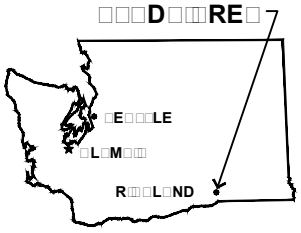

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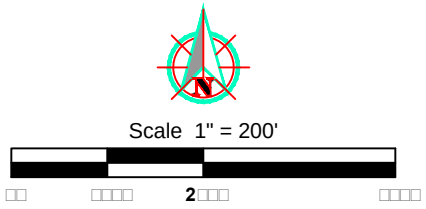

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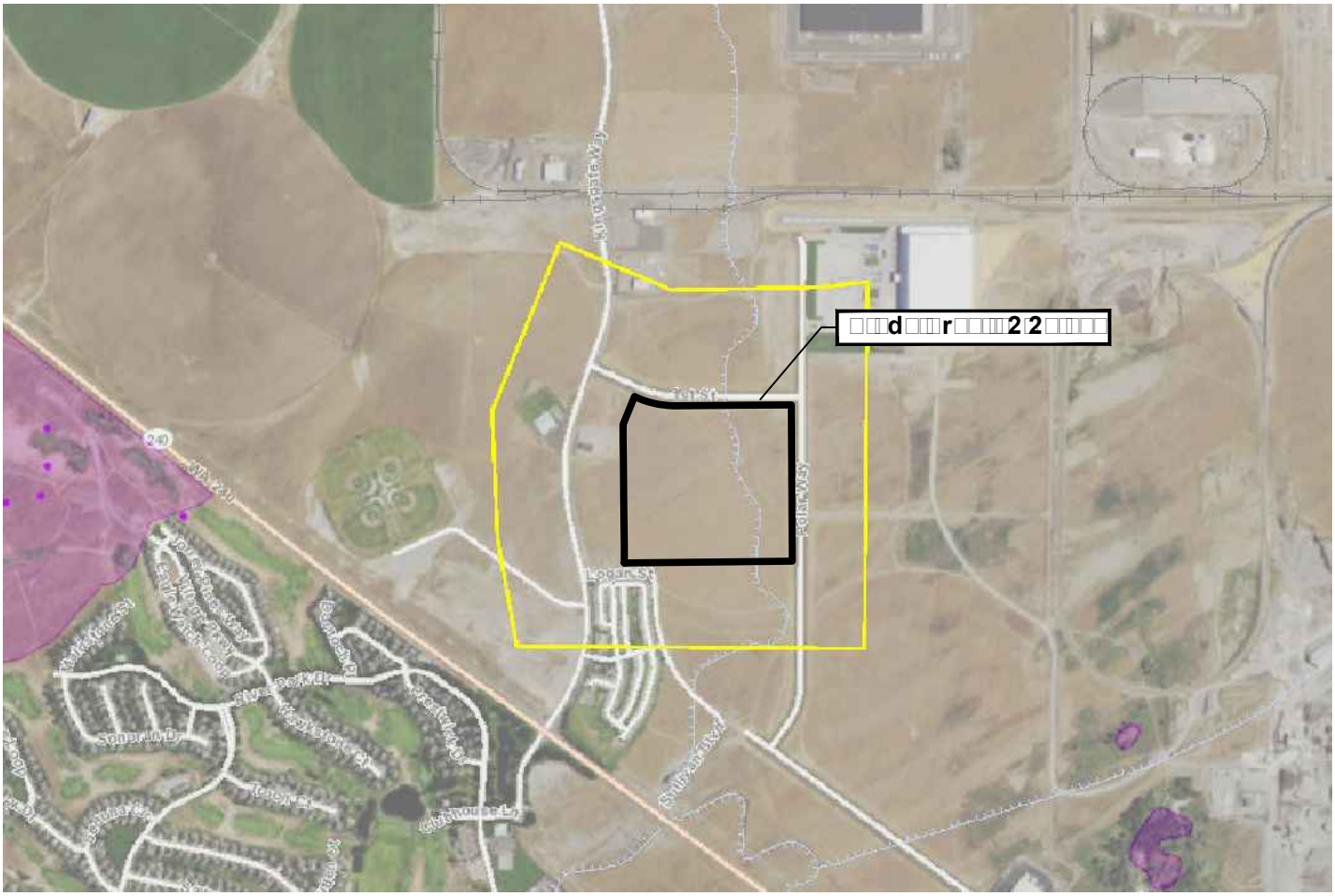

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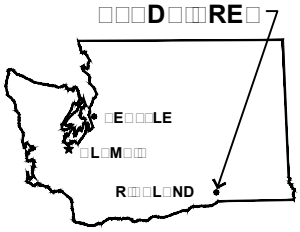

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SITE PHOTOGRAPHS

Photo 1. View to south from north edge in western portion of property. Greenish and yellowish vegetation is mostly tall tumblemustard.

Photo 2. View to north from center of site showing near complete dominance by cheat grass.

Photo 3. View to west from near the center of the site

Photo 4. View to northeast of slight swale in northeast portion of property. A couple of young sagebrush present in this area.

Photo 5. Ditch along Polar Way showing higher concentrations of tall tumblemustard, tumbleweed and prickly lettuce.

Photo 6. Cheat grass with old cornstalks

Photo 7. View to north of ditch area along Polar Way with areas of bare soil and tumbleweed in the ditch.

Photo 8. Burning bush plants are scattered across site.

Photo 9. Representative burrow found along road cut on north edge.

Photo 10. View to east along north edge showing roadside ditch

Photo 11. Representative burrow found along road cut on east edge.

Photo 12. Cluster of burrows in area of sparse vegetation.

CORRESPONDENCE

From: Ritter, Michael W (DFW)
To: Valencia-Gica, Rowena B (MIL)
Subject: RE: Richland Property for WAARNG Readiness Center
Date: Tuesday, April 4, 2017 2:46:27 PM

Rowena,
Thank you for the brief phone conversation. The proposed project site is currently operated as irrigated farmland located at 1st St. and Polar Way, Richland, WA.

I reviewed the project location within our PHS (Priority Habitats and Species) data base to determine if any State of Washington sensitive plant or animal species had been or are located within the project. My review did not reveal any PHS data points or polygons.

Based on this information, the Washington Department of Fish and Wildlife has no further comment on the proposed project.

Sincerely,

Michael Ritter
Area Habitat Biologist
Washington Department of Fish and Wildlife
2620 N. Commercial Ave
Pasco, WA 99301
509-543-3319 (office)
509-380-3028 (cell)

From: Valencia-Gica, Rowena B (MIL)
Sent: Tuesday, April 04, 2017 2:25 PM
To: Ritter, Michael W (DFW)
Subject: Richland Property for WAARNG Readiness Center

Hi Mike,

Greatly appreciate you giving me a call and talking to me about our land acquisition project in Richland WA. Your email about your response to my consult would also be greatly appreciated.

Sincerely,
Rowena

Rowena Valencia-Gica, Ph.D.
Environmental Programs Supervisor
WMD/WAARNG
36 Quartermaster Road
Camp Murray WA 98430

e WAARNG's Land Acquisition and Proposed Richland Readiness Center Project USFWS Concurrence No Effect

From: McReynolds, Ryan <ryan_mcreynolds@fws.gov>
Sent: Friday, February 3, 2017 12:39 PM
To: Valencia-Gica, Rowena B (MIL)
Cc: Ryan McReynolds
Subject: Re: WAARNG's Land Acquisition and Proposed Richland Readiness Center Project

Thank you Rowena for your emails and call.

Thank you also for providing information to help address your questions.

I agree with your assessment of the issue.

The species list identifies only a few listed species for this portion of Benton County ... I see no obvious reason why a proposed Readiness Center at this location would raise any significant issues related to yellow-billed cuckoo, gray wolf, northern wormwood, umtanum desert buckwheat, Columbia basin pygmy rabbit, or bull trout.

I agree, that in most, and perhaps each case it may be possible to document "no effect" ESA determinations; technically, a determination for bull trout would depend on some specifics, including stormwater management. But, I imagine that it should be pretty easy to design an effective stormwater management strategy for this site, and thereby avoid any significant impacts to the Yakima River.

My cursory reveiw of this location identifies no significant ESA issues. I think you can have pretty good confidence about that.

Does that meet your needs right now?

Thanks - Ryan -

Ryan McReynolds
U.S. Fish and Wildlife Service, Lacey WA
Consultation & Conservation Planning Division

e WAARNG's Land Acquisition and Proposed Richland Readiness Center Project USFWS Concurrence No Effect

ryan_mcreynolds@fws.gov
360.753.6047

On Fri, Jan 27, 2017 at 9:08 AM, Valencia-Gica, Rowena B (MIL) <Rowena.Valencia-Gica@mil.wa.gov> wrote:

Good morning Ryan,

Hope this email finds you well. I'm contacting you to discuss about the WAARNG's proposed Richland Readiness Center on a parcel of land (~40 ac) owned by the City of Richland located on 1st St. and Polar Way (see attached pdf map). We are dangerously close to finalizing the Purchase Sale Agreement but before reaching that point, we would like to make sure that the site does not have any potential project-stopping concerns. The site has been used as farmland for many years now (see attached map).

In September 2016, I obtained an official species list covering a larger area than the parcel for acquisition (see attached pdf). The list showed 4 potential species and no habitat present; of these 4 species, I am confident to say that two of them certainly are not found in our proposed site (bull trout and gray wolf). Our initial site assessment also showed that the other two species (yellow-billed cuckoo and Northern wormwood) also do not exist nor have habitats present on this site.

When we prepare the EA later for the construction/operation phase (still waiting for funding), my plan is to discuss any potential impacts under Biological Resources. My determination is that there is no need to prepare a Biological Evaluation for this site due to the very low potential of finding any T&E species. We'd like to make sure though that there are no serious roadblocks before we dive deeper into the purchase process.

I'd greatly appreciate your guidance.

Sincerely,
Rowena

Rowena Valencia-Gica, Ph.D.
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PBS | Engineering + Environmental

Geotechnical Engineering Report

Washington State Army National Guard
Richland Army National Guard Building
Richland, Washington

Prepared for:
Washington State Army National Guard
Attn: Mr. Ron Cross
Camp Murray Building 36
Tacoma, Washington 98430

October 18, 2016
Project No. 64395.000

400 Bradley Boulevard, Suite 300, Richland, WA 99352
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Prepared for:
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Attn: Mr. Ron Cross
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Prepared by:

10/18/2016

Adam Swenson, PE
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1.0 INTRODUCTION

1.1 General

This report presents the results of the PBS Engineering and Environmental Inc. (PBS) geotechnical engineering services for the proposed design and construction of the Richland Army National Guard Readiness Center in Richland, Washington. The site location is shown on the Vicinity Map, Figure 1. The approximate exploration locations in relation to existing site features are shown on the Site Plan, Figure 2.

1.2 Purpose and Scope

The purpose of PBS' services was to evaluate the subsurface conditions at the site and provide general geotechnical information needed to develop recommendations for use in design and construction of the proposed structure. This was accomplished by performing the following scope of services:

1.2.1 Literature and Records Review

PBS reviewed various relevant published geologic maps of the area for information regarding geologic conditions. We also reviewed previously completed reports for the project site provided by you and the design team, or that were available in our files.

1.2.2 Subsurface Explorations

PBS completed 3 borings (B-1 through B-3) and 10 test pits (TP-1 through TP-10) within the proposed site development area. The borings were explored to depths between 50.1 and 51.5 feet below the existing ground surface (bgs). The test pits were excavated to depths between 8 and 17 feet bgs. The borings and test pits were logged and representative soil samples collected by a PBS geotechnical engineer.

1.2.3 Infiltration Testing

PBS completed infiltration testing in TP-3 and TP-8. Open-hole, falling head infiltration testing was completed at a depth of approximately 8 and 6 feet bgs, respectively.

1.2.4 Soils Testing

Collected soil samples were transported to our laboratory for testing that included natural moisture contents and grain-size analyses (refer, Appendix B – Laboratory Testing).

1.2.5 Geotechnical Engineering Analysis

Data collected during the subsurface explorations, literature research, and laboratory testing were used to develop specific geotechnical design and construction recommendations.

1.2.6 Seismic Site Hazard Study

Using geologic maps and geologic hazard maps in conjunction with the results from the site-specific subsurface explorations, this report provides the following: discussion of the geologic profile, regional geologic, tectonic, and seismic settings, seismic source recommendations, discussion of ground response including amplification effects, evaluation of site-specific hazards including earthquake-induced landslides, liquefaction settlement, fault rupture, and seiche.

1.2.7 Report Preparation

This Geotechnical Engineering Report summarizes the results of our explorations, testing, and analyses, including information relating to the following:

- Exploration logs and site plan showing approximate exploration locations
- Laboratory test results
- Infiltration test results
- Earthwork and grading, cut, and fill recommendations:
  - structural fill materials and preparation
  - utility trench excavation and backfill requirements
  - slab and pavement subgrade preparation
  - wet weather considerations
- Shallow foundation recommendations:
  - minimum embedment
  - allowable bearing pressure
  - estimated settlement
  - sliding coefficient
- Lateral earth pressures for retaining wall design, including:
  - active, passive, and at-rest earth pressures
  - seismic lateral force
  - allowable bearing pressure
  - sliding coefficient
  - groundwater and drainage considerations
- Seismic design criteria in accordance with the 2015 International Building Code (IBC) including State of Washington amendments
- Recommended AC pavement section thicknesses

1.3 Project Understanding

PBS understands the Richland Army National Guard proposes to build a 40,000 square foot, single-story Readiness Center and training area with associated parking on a 40-acre portion of Benton County Parcel 121084000006003 near the intersection of 1st Street and Polar Way in Richland, Washington. Conceptual plans of the site design and building placement were not available at the time this report was prepared, and the building type, configuration, and location at the site have not yet been finalized. Our recommendations were developed based on loads of less than 200 kips for columns, 7.5 kips per linear foot for walls, and slab loads of less than 200 pounds per square foot (psf).

2.0 SITE CONDITIONS

2.1 Surface Description

The proposed Richland Army National Guard Readiness Center property is located in an area previously used for agriculture in the Horn Rapids area of Richland, Washington. The site is bounded by 1st Street to the north, Polar Way to the east, commercial properties to the west, and partially bounded to the south by Logan Street and other formerly agricultural land (refer, Figure 1), creating a nearly square parcel. The site sits on a gentle to moderate slope that descends to the east. The elevation across the site varies from approximately 426 feet above mean sea level (amsl) in the southwest corner of the site to approximately 383 feet amsl near the northeast corner.

2.2 Geologic Setting

2.2.1 Regional Geology

The proposed Richland Army National Guard Readiness Center site is located within the Pasco Basin, a structural and topographical low area that lies in the Columbia River Plateau physiographic province in southeast Washington and northeast Oregon. This province consists of a series of flood basalt flows of the Columbia River Basalt Group (CRBG) of the Miocene Epoch and early Pliocene Epoch (between 17 and 6 million years ago) age, forming an extensive volcanic plateau. The thick basalt of the CRBG forms the bedrock of the region.

The Pasco Basin lies within a tectonic subdivision of the Columbia River physiographic province known as the Yakima Fold Belt (Riedel et al., 1991). Deformation of the basalt flows has since occurred, which is generally attributed to regional north-south compression and associated folding, strike-slip faulting, and thrusting. This deformation of the basalt has generally led to a series of northwest-trending anticlinal ridges and synclinal valleys. The Pasco Basin is a large syncline on the easterly side of the Yakima Fold Belt.

2.2.2 Local Geology

According to published geologic mapping of the area (Rockwell International, 1979), the surficial geology overlying the basalt consists of the stabilized sand dune deposits (Qds). The sand is a surficial Holocene deposit from within the most recent 13,000 years.

2.2.3 Faults

The Wallula fault zone (No. 846) and the Rattlesnake Hills fault zone (No. 565) are mapped approximately 2.5 to 5 miles southwest of the proposed site (Personius, 2002). Although data about the fault system are limited, the USGS and DOGAMI classify it as active with most recent deformation of less than 1.6 million years ago.

2.3 Subsurface Conditions

2.3.1 Discussion

Subsurface conditions at the site were explored by advancing three borings, designated as B-1 through B-3, and by excavating ten test pits, designated as TP-1 through TP-10. The borings were advanced to depths between 50.1 and 51.5 feet bgs, on September 14, 2016, by Haz-Tech Drilling of Meridian, Idaho. The test pits were explored to depths of 8 to 17 feet bgs, on September 20, 2016, by Mahaffey Enterprises, Inc., of Kennewick, Washington.

2.3.2 Soils

PBS has summarized the subsurface units as follows:

SAND — SAND (SP) was encountered in all borings and test pits from the surface to depths between 40 and 50 feet bgs. The relative density ranged from medium dense to dense with Standard penetration test (SPT) and Dynamic Cone Penetrometer (DCP) blow counts generally between 10 to over 40, with the exception of loose sand within the top 5-feet of the soil layer. The sand was generally medium to fine-grained with variable amounts of silt and gravel, and had moisture contents of generally less than 10 percent.

GRAVEL — GRAVEL (GP) with sand and silt was encountered at depths between 40 and 50 feet bgs. The relative density was very dense

with Standard penetration test (SPT) blow counts of over 50. The gravel was generally coarse and rounded, and the sand was generally medium to fine-grained with silt content less than 10 percent. The gravel felt dry to the touch.

2.3.3 Groundwater

Groundwater was not observed during the subsurface explorations on the dates completed. Existing information regarding the groundwater depths in the project area were obtained from the Washington State Department of Ecology well log database. The data were recorded in 2013. Based on the nearby well logs, groundwater underlying the site is below approximately 50 feet bgs.

Perched groundwater may be encountered at the project site and may fluctuate due to variations in rainfall, agricultural irrigation, and the season.

2.3.4 Infiltration Testing

PBS completed two infiltration tests, one each in TP-3 and TP-8, at a depth of approximately 8.0 and 6.0 feet bgs, respectively. The tests were completed in general accordance with the procedures outlined in the Stormwater Management Manual for Eastern Washington. The test pit was advanced to the test depth and then filled with to an initial head of approximately 3 feet of water, saturating the surrounding soils. The water was then allowed to drain and the water depth was recorded at regular, timed intervals. From initial saturation to the end of testing, the test durations were 64 and 46 minutes for TP-3 and TP-8, respectively.

The following Table 1 presents test depth, the field-measured infiltration rate, and soil classification.

Table 1. Infiltration and Laboratory Test Results

Test Pit	Depth of Infiltration Test (feet bgs)	Infiltration Rate[1] (inches/hour)	Soil Classification
TP-3	8	15.6	SAND (SP-SM) with silt and gravel
TP-8	6	9.3	SAND (SP-SM) with silt and gravel

[1] Field-measured infiltration rate.

The infiltration rates listed in Table 1 are not permeability or hydraulic conductivity rates, but field-measured rates, and do not include correction factors related to long-term infiltration rates. The design engineer should determine the appropriate correction factors to account for the planned level of pre-treatment, maintenance, vegetation, siltation, etc. Field-measured infiltration rates are typically reduced by a factor of two to four for use in design.

3.0 CONCLUSIONS AND RECOMMENDATIONS

3.1 Geotechnical Design Considerations

The subsurface conditions at the site consist primarily of medium to fine-grained sand alluvium. Based on our observations and analyses, conventional foundation supported on shallow spread footings is feasible for the proposed construction, and excavation with conventional equipment

is feasible for the site. Final grading plans for the project have not been completed for this site. We have not evaluated the impacts of site grading on the stability of the existing slopes and have estimated settlement of the underlying soils based on the estimated loads.

Depending on the future (proposed) location of the building, additional field exploration may be required to better evaluate the subsurface conditions beneath the proposed building footprint and to refine our recommendations, as needed.

3.2 Shallow Foundations

Shallow spread footings bearing on native medium dense sand and silt may be used to support loads associated with the proposed construction, provided the recommendations in this report are followed. Footings should be supported on firm native soils or properly compacted structural fill.

3.2.1 Footing Preparation

Excavations for footings should be carefully prepared to a medium dense/compact state. A representative from PBS should confirm suitable bearing conditions and evaluate all exposed footing subgrades. Observations should also confirm that loose materials have been removed or compacted to a dense condition within the new footing excavations, concrete slab-on-grade areas, and pavement areas. In the event that loose, wet, or deleterious materials are encountered, PBS may require localized deepening of the footing excavations.

We recommend a layer of compacted, crushed rock be placed over the footing subgrades to help protect them from disturbance due to foot traffic and the elements. Placement of this rock is the prerogative of the contractor; regardless, the footing subgrade should be in a dense or stiff condition prior to pouring concrete. Based on our experience in the area, approximately 4-inches of compacted crushed rock will be suitable beneath the footings.

3.2.2 Footing Embedment Depths

We recommend that all footings be founded a minimum of 24 inches below the lowest adjacent grade. The footings should be founded below an imaginary line projecting upward at a 1H:1V (horizontal to vertical) slope from the base of any adjacent, parallel utility trenches or deeper excavations.

3.2.3 Minimum Footing Widths / Design

Continuous wall and isolated spread footings should be at least 18 and 24 inches wide, respectively. Footings should be sized using a maximum allowable bearing pressure of 2,500 pounds per square foot (psf). This is a net bearing pressure and the weight of the footing and overlying backfill can be disregarded in calculating footing sizes. The recommended allowable bearing pressure applies to the total of dead plus long-term-live loads. Allowable bearing pressures may be increased by one-third for seismic and wind loads.

3.2.4 Foundation Static Settlement

Footings will settle in response to column and wall loads. Based on our evaluation of the subsurface conditions and our analysis, we estimate post-construction settlement will be less than one inch for the column and perimeter foundation loads. Differential settlement will be on the order of one-half of the total settlement.

3.2.5 Lateral Resistance

Lateral loads can be resisted by passive earth pressure on the sides of and by friction at the base of the footings. A passive earth pressure of 300 pounds per cubic foot (pcf) may be used for footings confined by native soils and new structural fills. The allowable passive pressure has been reduced by one-half to account for the large amount of deformation required to mobilize full passive resistance. Adjacent floor slabs, pavements, or the upper 12-inch depth of adjacent unpaved areas should not be considered when calculating passive resistance. For footings supported on native soils or new structural fills, use a coefficient of friction equal to 0.4 when calculating resistance to sliding. These values do not include a factor of safety (FS).

3.3 Retaining Walls

The proposed building may include retaining walls as part of the general site grading design. The following recommendations are based on the assumption of flat conditions in front of and behind the wall and fully drained backfill. For unrestrained walls allowed to rotate at least 0.005H about the base, where H is the height of the wall, we recommend using an active earth pressure of 35 psf. Where walls are constrained against rotation, we recommend using an “at-rest” earth pressure equal to 55 psf. We recommend any retaining walls founded on native soil or compacted structural fill be provided with adequate drainage and backfilled with clean, angular, crushed rock fill, in accordance with the recommendations provided in Section 4.6.

For seismic loading, we recommend using an inverted triangular distribution (seismic surcharge) with a maximum magnitude of 6H psf. Walls should be designed by applying the active earth pressure plus the seismic loading, or at-rest earth pressures, whichever is greater. If vertical surcharge loads, q, are present within 0.5H of the wall, a lateral surcharge of 0.3q (for walls allowed to rotate) and 0.5q (for restrained walls) should be applied as a uniform horizontal surcharge active over the full height of the wall. These values assume that the wall is vertical and the backfill behind the wall is horizontal. Seismic lateral earth pressures were computed using the Mononobe-Okabe equation. Recommended lateral earth pressure distributions are shown on Figure 3, Retaining Wall Earth Pressure Diagram. Additional lateral pressures due to surcharge loads can be estimated using the guidelines shown on Figure 4, Lateral Surcharge Detail.

Lateral loads can also be resisted by a passive resistance of 300 psf acting against embedded walls and foundations, and by friction acting on the base of spread footings or mats using a friction coefficient of 0.4.

3.4 Seismic Design Criteria

Subsurface conditions encountered to the depths explored consist primarily of medium dense sand and sand with variable amounts of silt and gravel. Well logs and geologic cross-sections from this area indicate that soil below the depth of our explorations consists of sand and gravel. The soil profile in the top 100 feet at this site conforms to a seismic design Site Class D for a “stiff soil” profile.

The seismic design parameters, in accordance with the 2015 IBC, are summarized in Table 2 as follows:

Table 2. 2015 IBC Seismic Design Parameters

Parameter	Short Period	1 Second
Maximum Credible Earthquake Spectral Acceleration	S_s = 0.41 g	S_1 = 0.16 g
Site Class	D	
Site Coefficient	F_a = 1.20	F_v = 1.64
Adjusted Spectral Acceleration	S_{MS} = 0.60 g	S_{M1} = 0.34 g
Design Spectral Response Acceleration Parameters	S_{DS} = 0.40 g	S_{D1} = 0.23 g
Design Spectral Peak Ground Acceleration	**0.17 g**	

g – Acceleration due to gravity

Seismic hazards considered include earthquake-induced landslides, fault rupture, and earthquake shaking. Based on the topography and geology at the site, we consider the risk from earthquake-induced landslides to be low. Strong earthquake ground shaking may occur during a design-level seismic event on the Wallula fault zone and the Rattlesnake Hill zone. These faults are shown approximately 2.5 to 5 miles southwest of the proposed site according to the Washington State Department of Natural Resources, but are not included in the US Geological Survey (USGS) Quaternary Faults and Folds database. Based on our current understanding of the project, our opinion is that effects of earthquake ground motions can be accounted for by using code-based design procedures.

3.5 Floor Slabs

Satisfactory subgrade support for building floor slabs can be obtained from the native sand subgrade prepared in accordance with our recommendations presented in the Site Preparation, Subgrade Protection in Wet Conditions, and Select Borrow sections of this report. A minimum six-inch-thick layer of imported granular material should be placed and compacted over the prepared/compacted subgrade or structural fill. Imported granular material should be composed of crushed rock or crushed gravel that is relatively well graded between coarse and fine, contains no deleterious materials, has a maximum particle size of 1½-inch, and has less than five percent by dry weight passing the US Standard No. 200 Sieve.

Floor slabs supported on a compacted subgrade and base course prepared in accordance with the preceding recommendations may be designed using a modulus of subgrade reaction (k) of 150 pounds per cubic inch (pci).

3.6 Pavement Section Suggestions

PBS understands that the parking areas at the site will consist of AC pavement limited to car and light truck traffic. We assume the access drive for the facility may receive limited heavy truck traffic. The AC pavement was evaluated using a pavement design life of 20 years and an assumed truck factor of 2.0 equivalent single-axle loads (ESAL) per truck. Based on the anticipated 5 trucks per day, we have estimated total ESALs for a 20-year design life. The native subgrade under AC pavement areas should be prepared by scarifying, moisture conditioning, and recompacting a minimum of 12 inches below the bottom of the base course. Our AC pavement design recommendations are based on the following design parameters:

- A resilient modulus of 4,500 pounds per square inch (psi) (equivalent to a California Bearing Ratio [CBR] value of three) was used for the medium dense sand with silt that has been recompacted to a depth of 12 inches bgs
- A resilient modulus of 28,000 psi was assumed for the aggregate base rock
- Initial and terminal serviceability index of 4.2 and 2.5, respectively
- Reliability and standard deviation of 90 percent and 0.45, respectively
- Structural coefficient of 0.43 and 0.13 for the asphalt and aggregate base rock, respectively
- Pavement suggestions were evaluated using the American Association of State Highway and Transportation Officials (AASHTO) design methods

Table 3. Minimum AC Pavement Sections

Traffic Loading	AC (inches)	Base Rock (inches)	Subgrade
Pull-in Car Parking Areas	3.0	9.0	Medium dense sand subgrade compacted to 92% of ASTM D 1557
Drive Lanes and Access Roads	5.0	10.0	

The AC binder should be performance graded according to the WSDOT SS 9-02.1(4) – Performance Graded Asphalt Binder. The AC should consist of ½-inch, hot mix asphalt (HMA). The maximum lift thickness should be 3.0 inches. The AC should conform to WSDOT SS 5-04.3(7)A – Mix Design, WSDOT SS 9-03.8(2) – HMA Test Requirements, and WSDOT SS 9-03.8(6) – HMA Proportions of Materials. The AC should be compacted to 91 percent of the maximum theoretical density (Rice value) of the mix, as determined in accordance with the ASTM D 2041, following the guidelines set in WSDOT SS 5-04.3(10) – Compaction.

Heavy construction traffic on new pavements or partial pavement sections (such as base course over the prepared subgrade) will likely exceed the design loads and could potentially damage or shorten the pavement life. Therefore, we recommend construction traffic not be allowed on new pavements, or that the contractor take appropriate precautions to protect the subgrade and pavement during construction.

4.0 CONSTRUCTION RECOMMENDATIONS

4.1 Site Preparation

Construction of the proposed building will involve clearing and grubbing of the existing vegetation and recompaction of the exposed subgrade. The expected depth of site clearing and grubbing of surface vegetation and roots measuring a minimum of one inch in diameter is approximately one foot.

4.2 Proofrolling/Subgrade Verification

Following site preparation and prior to placing aggregate base for the shallow foundations, building pad, or pavement sections, the exposed subgrade should be evaluated either by proofrolling or another method of subgrade verification. The subgrade should be proofrolled with a fully loaded dump truck or similar heavy, rubber-tire construction equipment to identify unsuitable areas. If evaluation of the subgrades occur during wet conditions, or if proofrolling the

subgrades will result in disturbance, they should be evaluated by a member of the PBS engineering staff using a steel foundation probe. We recommend that PBS be retained to observe the proofrolling and perform the subgrade verifications. Unsuitable areas identified during the field evaluation should be compacted to a firm condition or be excavated and replaced with compacted structural fill.

4.3 Subgrade Protection in Wet Conditions

Protection of the subgrade is the responsibility of the contractor. Track-mounted excavating equipment may be required during wet weather. The thickness of the haul roads to access the site for excavation and staging areas will depend on the amount and type of construction traffic. The material used for haul roads or site access drives should be stabilization material described below. A 12- to 18-inch-thick mat of stabilization material should be sufficient for light staging areas. The stabilization material for haul roads and areas with repeated heavy construction traffic typically needs to be increased to between 18 to 24 inches. The actual thickness of haul roads and staging areas should be based on the contractor's approach to site work and the amount and type of construction traffic, and is the contractor's responsibility. The stabilization material should be placed in one lift over the prepared, undisturbed subgrade and compacted using a smooth-drum, non-vibratory roller. Additionally, a geotextile fabric should be placed as a barrier between the subgrade and stabilization material. The geotextile should meet specifications and be installed in conformance with WSDOT SS Section 2-12.3.

4.4 Excavation

The near-surface soils at the site can be excavated with conventional earthwork equipment. Sloughing and caving should be anticipated. All excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and State regulations. The contractor is solely responsible for adherence to the OSHA requirements. Trench cuts may stand relatively vertical to a depth of approximately four feet bgs. Open excavation techniques may be used in the sand provided the excavation is configured in accordance with the OSHA requirements and with the understanding that some sloughing and caving will likely occur. The trenches should be flattened if sloughing occurs. If vertical walls are desired for cuts deeper than four feet bgs, use of a trench shield or other approved temporary shoring is highly recommended.

4.5 Slopes

If the project will include slopes or open excavation, temporary and permanent cut slopes up to 10 feet high may be inclined at 1.5H:1V and 2H:1V, respectively. Access roads and pavements should be located at least five feet from the top of temporary slopes. Surface water runoff should be collected and directed away from slopes to prevent water from running down the face.

4.6 Structural Fill

The extent of site grading is currently unknown; however, we estimate cuts and fills will be limited in depth/thickness of approximately five feet. Structural fill, including base rock, should be placed over subgrades that have been prepared in conformance with Section 4.3, Subgrade Protection in Wet Conditions. Structural fill material should consist of relatively well-graded soil, or an approved rock product that is free of organic material and debris, and contains particles not greater than 3-inches nominal dimension.

If fill and excavated material will be placed on slopes steeper than 5H:1V, these must be keyed/benched into the existing slopes and installed in horizontal lifts. Vertical steps between benches should be approximately two feet.

4.6.1 On-Site Soil

On-site soils encountered in our explorations are generally suitable for placement as structural fill during moderate, dry weather when moisture content can be maintained by air drying and/or addition of water. The fine-grained fraction of the site soils are moisture sensitive, and during wet weather, may become unworkable because of excess moisture content. In order to reduce moisture content, some aerating and drying of fine-grained soils may be required. The material should be placed in lifts with a maximum uncompacted thickness of approximately 8 inches and compacted to at least 92 percent of the maximum dry density, as determined by ASTM D 1557 (modified Proctor).

4.6.2 Gravel Borrow

Borrow material for general structural fill construction should meet the requirements set forth in WSDOT SS 9-03.14(1) – Gravel Borrow. When used as structural fill, borrow material should be placed in lifts with a maximum uncompacted thickness of approximately 8 inches and compacted to not less than 92 percent of the maximum dry density, as determined by ASTM D 1557.

4.6.3 Select Borrow

Selected granular backfill used during periods of wet weather for structural fill construction should meet the specifications provided in WSDOT SS 9-03.14(2) – Select Borrow. The imported granular material should be uniformly moisture conditioned to within about 2 percent of the optimum moisture content and compacted in relatively thin lifts using suitable mechanical compaction equipment. Selected granular backfill should be placed in lifts with a maximum uncompacted thickness of 8 to 12 inches and be compacted to not less than 95 percent of the maximum dry density, as determined by ASTM D 1557.

4.6.4 Crushed Aggregate Base

Crushed aggregate base course below floor slabs, spread footings, and asphalt concrete pavements should be clean, crushed rock or crushed gravel that contains no deleterious materials and meets the specifications provided in WSDOT SS 9-03.9(3) – Crushed Surfacing, and have less than 7.5 percent by dry weight passing the US Standard No. 200 Sieve. The crushed aggregate base course should be compacted to at least 95 percent of the maximum dry density, as determined by ASTM D 1557.

4.6.5 Utility Trench Backfill

Trench backfill in structural areas should be composed of suitable granular soils such as sand, gravel, and crushed rock. Pipe bedding placed to uniformly support and surround the barrel of pipe should meet specifications provided in WSDOT SS 9-03.12(3) – Gravel Fill for Pipe Zone Bedding. The pipe zone extends at least 6 inches above and below utility lines. The pipe zone backfill material should be compacted to at least 90 percent of the maximum dry density, as determined by ASTM D 1557, or as required by the pipe manufacturer.

The remainder of the trench backfill should consist of well-graded granular material with less than 10 percent by dry weight passing the US Standard No. 200 Sieve, and should meet standards prescribed by WSDOT SS 9-03.19 – Bank Run Material for Trench Backfill. This material should be compacted to at least 92 percent of the maximum dry density, as determined by ASTM D 1557, or as required by the pipe manufacturer. The upper 2 feet of the trench backfill should be compacted to at least 95 percent of the maximum dry density,

as determined by ASTM D 1557. Controlled low-strength material (CLSM), WSDOT SS 2-09.3(1)E – Backfilling, can be used as an alternative.

4.6.6 Stabilization Material

Stabilization rock should consist of pit- or quarry-run rock that is well-graded, angular, crushed rock consisting of 4- or 6-inch-minus material with less than 5 percent passing the US Standard No. 4 Sieve. The material should be free of organic matter and other deleterious material. WSDOT SS 2-03.3(14)A – Rock Embankment Construction can be used as a general specification for this material and construction methods, with the stipulation of limiting the maximum size to 6 inches.

5.0 ADDITIONAL SERVICES AND CONSTRUCTION OBSERVATIONS

In most cases, other services beyond completion of a geotechnical engineering report are necessary or desirable to complete the project. Occasionally, conditions or circumstances arise that require the performance of additional work that was not anticipated when the geotechnical report was written. PBS offers a range of environmental, geological, geotechnical, and construction services to suit the varying needs of our Clients.

PBS should be retained to review the plans and specifications for this project before they are finalized. Such a review allows us to verify that our recommendations and concerns have been adequately addressed in the design.

Satisfactory earthwork performance depends on the quality of construction. Sufficient observation of the contractor's activities is a key part of determining that the work is completed in accordance with the construction drawings and specifications. We recommend that PBS be retained to observe general excavation, stripping, fill placement, and footing and pavement subgrades. Subsurface conditions observed during construction should be compared with those encountered during the subsurface explorations. Recognition of changed conditions requires experience; therefore, qualified personnel should visit the site with sufficient frequency to detect whether subsurface conditions change significantly from those anticipated.

6.0 LIMITATIONS

This report has been prepared for the exclusive use of the addressee, and their architects and engineers, for aiding in the design and construction of the proposed building and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without express written consent of the Client and PBS. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials, and contractors to ensure correct implementation of the recommendations.

The opinions, comments, and conclusions presented in this report are based upon information derived from our literature review, field explorations, laboratory testing, and engineering analyses. It is possible that soil, rock, or groundwater conditions could vary between or beyond the points explored. If soil, rock, or groundwater conditions are encountered during construction that differ from those described herein, the Client is responsible for ensuring that PBS is notified immediately so that we may reevaluate the recommendations of this report.

Unanticipated fill, soil and rock conditions, and seasonal soil moisture and groundwater variations are commonly encountered and cannot be fully determined by merely taking soil samples from borings and test pits. Such variations may result in changes to our recommendations and may

require additional funds for expenses to attain a properly constructed project. Therefore, we recommend a contingency fund to accommodate such potential extra costs.

The scope of services for this subsurface exploration and geotechnical report did not include environmental assessments or evaluations regarding the presence or absence of wetlands or hazardous substances in the soil, surface water, or groundwater at this site.

If there is a substantial lapse of time between the submission of this report and the start of work at the site, if conditions have changed due to natural causes or construction operations at or adjacent to the site, or if the basic project scheme is significantly modified from that assumed, this report should be reviewed to determine the applicability of the conclusions and recommendations presented herein. Land use, site conditions (both on and off site), or other factors may change over time and could materially affect our findings. Therefore, this report should not be relied upon after three years from its issue, or in the event that the site conditions change.

7.0 REFERENCES

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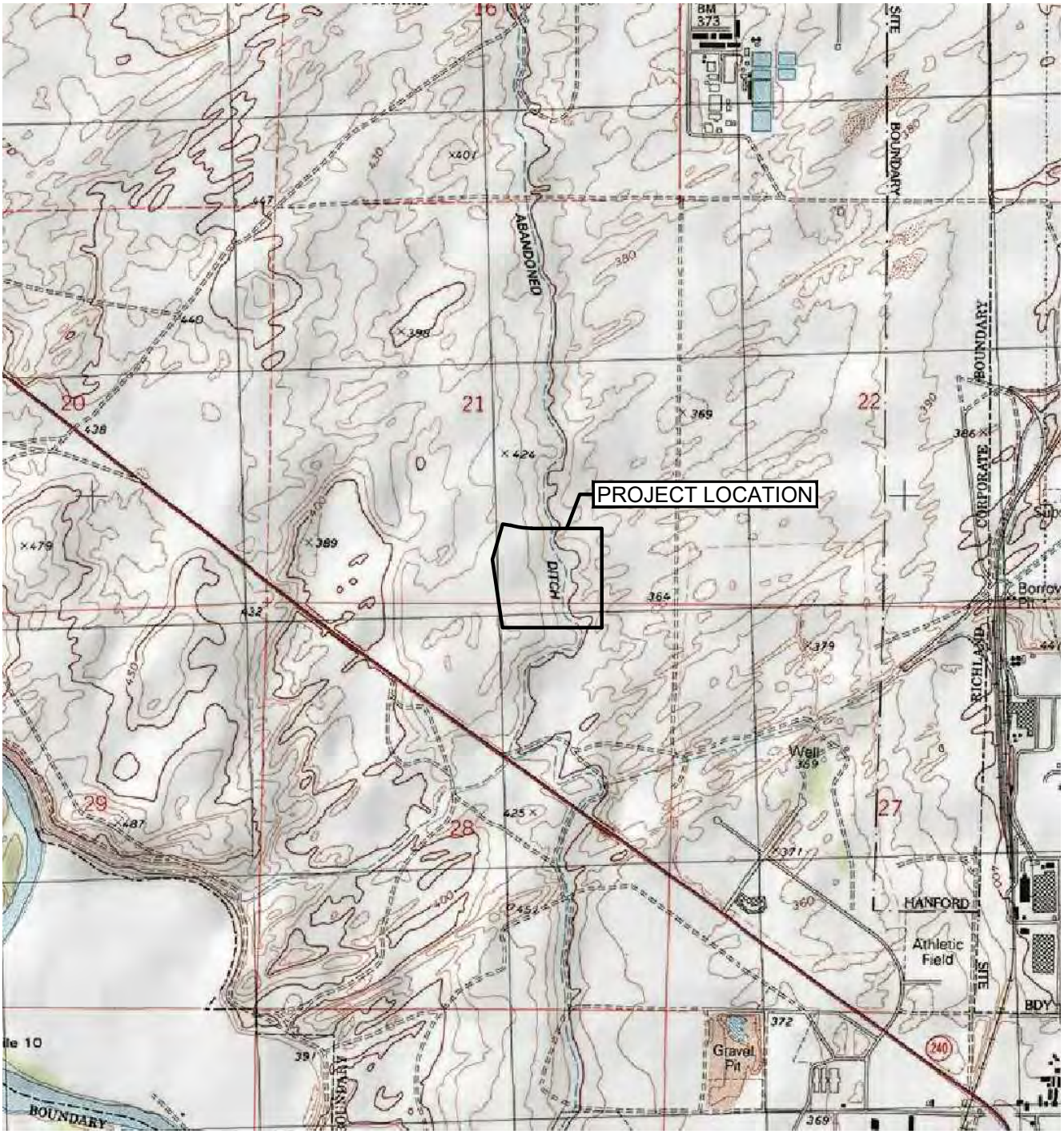
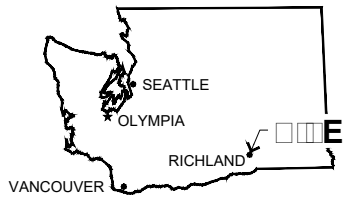
FIGURES



SOURCE: USGS RICHLAND WA QUADRANGLE 1992, PHOTO REVISED 1990.



0' 1,000' 2,000' 4,000'

SCALE: 1" = 2,000'

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PROJECT #	VICINITY MAP	FIGURE
64395.000	WASHINGTON ARMY NATIONAL GUARD BUILDING RICHLAND, WASHINGTON	
DATE OCT 2016		

L:\Projects\64000\64300-64399\64395_CFMO\DWG\64395.000_FIG 1-2.dwg Oct 10, 2016 03:51pm jimb

SOURCE: © 2016 GOOGLE EARTH PRO.

LEGEND

TP-1	TEST PIT NUMBER AND LOCATION
B-1	BORING NUMBER AND LOCATION

0' 150' 300' 600'

SCALE: 1" = 300'

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PROJECT # 64395.000

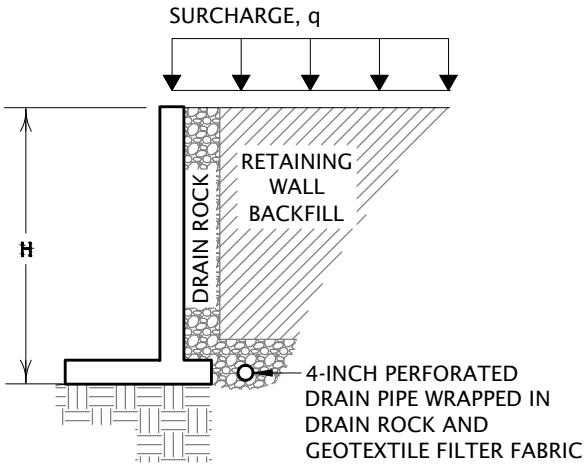
DATE OCT 2016

SITE PLAN

WASHINGTON ARMY NATIONAL GUARD BUILDING
RICHLAND, WASHINGTON

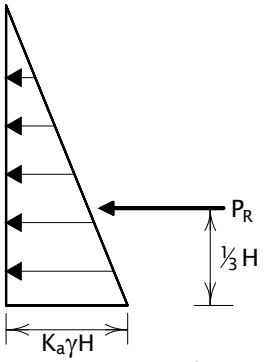
FIGURE 2

L:\Projects\64000\64300-64399\64395_CFMO\DWG\64395.000_FIG 1-2.dwg Oct 10, 2016 03:53pm jimb



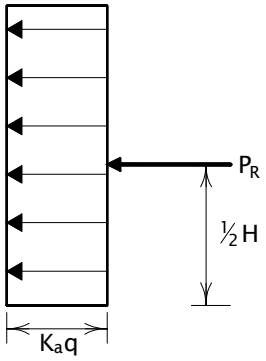
PARAMETER	VALUE
K_a	0.3
K_o	0.4
ΔK_{ae}	0.2
γ	110 pcf

ACTIVE EARTH PRESSURE



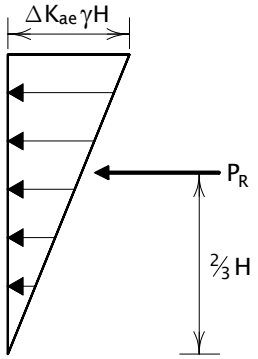
$P_R = K_a \gamma \frac{H^2}{2}$

SURCHARGE PRESSURE (ACTIVE)



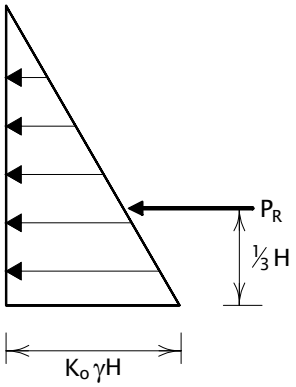
$P_R = K_a q H$

SEISMIC SURCHARGE PRESSURE



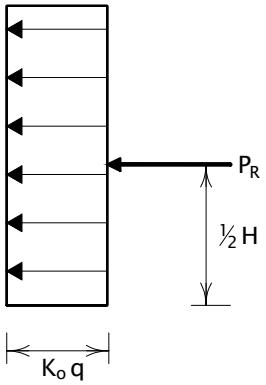
$P_R = \Delta K_{ae} \gamma \frac{H^2}{2}$

AT-REST EARTH PRESSURE



$P_R = K_o \gamma \frac{H^2}{2}$

SURCHARGE PRESSURE (AT-REST)



$P_R = K_o q H$

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DATE OCT 2016

RETAINING WALL EARTH PRESSURE DIAGRAM

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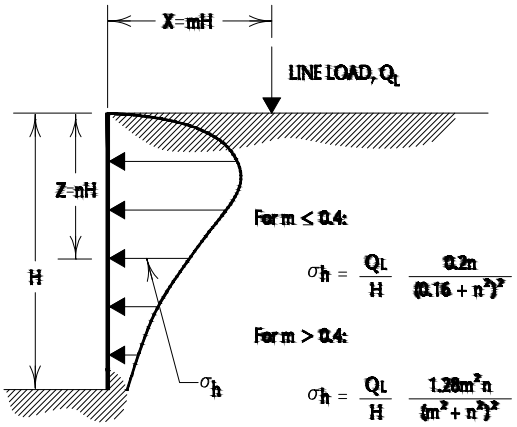
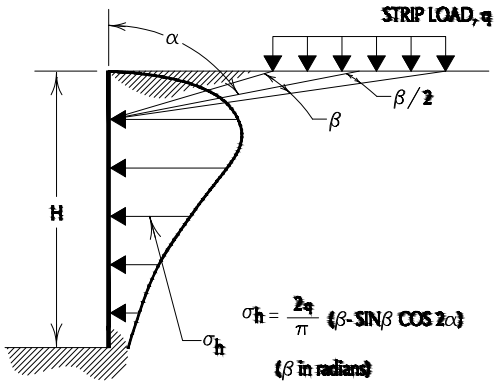
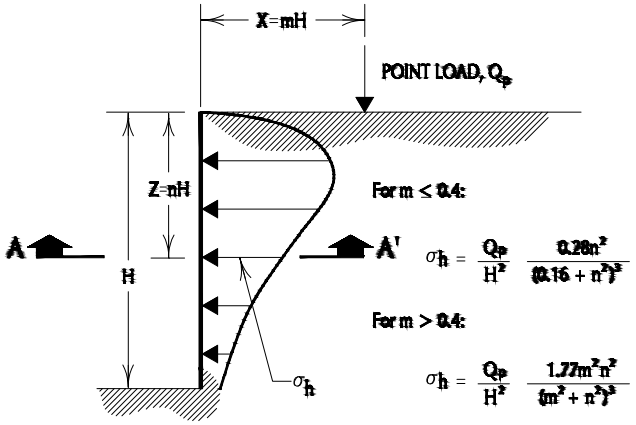
FIGURE

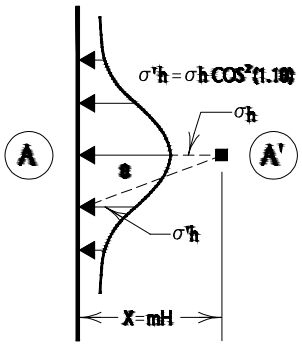


LINE LOAD PARALLEL TO WALL



STRIP LOAD PARALLEL TO WALL





DISTRIBUTION OF HORIZONTAL PRESSURES

VERTICAL POINT LOAD

NOTES:

1. THESE GUIDELINES APPLY TO RIGID WALLS WITH POISSON'S RATIO ASSUMED TO BE 0.5 FOR BACKFILL MATERIALS.
2. LATERAL PRESSURES FROM ANY COMBINATION OF ABOVE LOADS MAY BE DETERMINED BY THE PRINCIPLE OF SUPERPOSITION.

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PROJECT # 64395.000

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LATERAL SURCHARGE DETAIL

WASHINGTON ARMY NATIONAL GUARD BUILDING
RICHLAND, WASHINGTON

FIGURE

APPENDIX A

Field Explorations

APPENDIX A – FIELD EXPLORATIONS

A1.0 GENERAL

PBS explored the subsurface conditions at the project site by advancing three borings on September 14, 2016, and by excavating ten test pits on September 20, 2016. The approximate locations of the explorations are shown on Figure 2, Site Plan. The procedures and techniques used to excavate the borings and test pits, collect samples, and other field techniques, are described in detail in the following paragraphs. Unless otherwise noted, all soil sampling and classification procedures followed local engineering practices that are in general accordance with relevant ASTM procedures. “General accordance” means that certain local and common excavation and descriptive practices and methodologies have been followed.

A2.0 BORINGS

A2.1 Excavation and Sampling

The borings were advanced to depths up to 51.5 feet bgs with a CME CB-75 truck-mounted drill rig, using hollow-stem auger drilling techniques. The drill rig was provided and operated by Haz-Tech Drilling of Meridian, Idaho. The borings were observed by a PBS engineer, who located the general areas for exploration and maintained a detailed log of the subsurface conditions and materials encountered during the course of the work.

A2.2 Sampling

Disturbed soil samples were taken in the borings at selected depth intervals. The samples were obtained using a standard 2-inch outside diameter (OD), split-spoon sampler following procedure prescribed for the Standard Penetration Test (SPT). Using the SPT, the sampler is driven 18 inches into the soil using a 140-pound hammer dropped 30 inches. The number of blows required to drive the sampler the last 12 inches is defined as the standard penetration resistance, or N-value. The N-value provides a measure of the relative density of granular soils such as sands and gravels, and the consistency of cohesive soils such as clays and plastic silts. The disturbed soil samples were examined by the PBS engineer and then sealed in plastic bags for further examination and physical testing in our laboratory.

A2.3 Boring Logs

The logs show the various types of materials that were encountered in the borings and the depths where the materials or soil characteristics changed, although the changes may be gradual. Where material types and descriptions changed between samples, the contacts were interpreted. The types of samples taken during drilling, along with their sample identification number, are shown to the right of the classification of materials. Standard penetration resistances (N-values) and natural water (moisture) readings are plotted in the column to the right. Groundwater was not encountered in the borings at the time of exploration.

A3.0 TEST PITS

A2.1 Excavation

Test pits were excavated with a track-mounted CAT 320C excavator with a 36-inch toothed-bucket operated by Mahaffey Enterprises, Inc., of Kennewick, Washington. The test pits were observed by a PBS engineer, who maintained a detailed log of the subsurface conditions and materials encountered during the course of the work.

A2.2 Sampling

Disturbed soil samples were taken in the test pits to determine the variation of the subsurface profile across the site. The samples were obtained from the floor or sidewalls of the test pit or

from the bucket for samples taken below 4 feet bgs. The disturbed soil samples were examined by a PBS engineer, and then sealed in plastic bags for further examination and physical testing in our laboratory.

A2.3 Dynamic Cone Penetration (DCP) Testing

DCP testing was completed at specific depths in the test pit explorations. DCP testing uses a standardized cone driven into the subgrade soils with a 15-pound weight dropped 20 inches. The blow counts recorded for 1¾-inches of penetration is roughly equivalent to a Standard Penetration Test resistance (SPT blow count, i.e., N-value). DCP test results are shown on the test pit logs presented in Appendix A.

A2.3 Test Pit Logs

Test pit logs describe the subsurface conditions and types of materials encountered in the test pits and the depths where the materials or conditions changed, although the changes may be gradual. Each test pit log shows the locations of the samples obtained. Groundwater was not observed during test pit excavation.

A4.0 MATERIAL DESCRIPTION

Initially, soil samples were classified visually in the field. Consistency, color, relative moisture, degree of plasticity, and other distinguishing characteristics of the soil samples were noted. Afterward, the samples were reexamined in the PBS laboratory, various standard classification tests were conducted, and the field classifications were modified where necessary. The terminology used in the soil classifications and other modifiers are defined in Appendix A, Table A-1, Terminology Used to Describe Soil.

PBS

Table A-1
Terminology Used to Describe Soil

Soil Descriptions

Soils exist in mixtures with varying proportions of components. The predominant soil, i.e., greater than 50 percent based upon total dry weight, is the primary soil type and is capitalized in our log descriptions, e.g., SAND, GRAVEL, SILT or CLAY. Lesser percentages of other constituents in the soil mixture are indicated by use of modifier words in general accordance with the Visual-Manual Procedure (ASTM D2488-06). "General Accordance" means that certain local and common descriptive practices have been followed. In accordance with ASTM D2488-06, group symbols (such as GP or CH) are applied on that portion of the soil passing the 3-inch (75mm) sieve based upon visual examination. The following describes the use of soil names and modifying terms used to describe fine- and coarse-grained soils.

Fine - Grained Soils (More than 50% fines passing 0.075 mm, #200 sieve)
The primary soil type, i.e. SILT or CLAY is designated through visual – manual procedures to evaluate soil toughness, dilatency, dry strength, and plasticity. The following describes the terminology used to describe fine - grained soils, and varies from ASTM 2488 terminology in the use of some common terms.

Primary soil NAME, adjective and symbols			Plasticity Description	Plasticity Index (PI)
SILT ML & MH	CLAY CL & CH	ORGANIC SILT & CLAY OL & OH		
SILT		Organic SILT	Non-plastic	0 - 3
SILT		Organic SILT	Low plasticity	4 - 10
SILT / Elastic SILT	Lean CLAY	Organic clayey SILT	Medium Plasticity	10 – 20
Elastic SILT	Lean/Fat CLAY	Organic silty CLAY	High Plasticity	20 – 40
Elastic SILT	Fat CLAY	Organic CLAY	Very Plastic	>40

Modifying terms describing secondary constituents, estimated to 5 percent increments, are applied as follows:

Description	% Composition
With sand; with gravel (combined total greater than 15% but less than 30%, modifier is whichever is greater)	15% to 30%
Sandy; or gravelly (combined total greater than 30% but less than 50%, modifier is whichever is greater)	30% to 50%

Borderline Symbols, for example CH/MH, are used where soils are not distinctly in one category or where variable soil units contain more than one soil type. **Dual Symbols,** for example CL-ML, are used where two symbols are required in accordance with ASTM D2488.

Soil Consistency. Consistency terms are applied to fine-grained, plastic soils (i.e., PI $\geq$ 7). Descriptive terms are based on direct measure or correlation to the Standard Penetration Test N-value as determined by ASTM D1586-84, as follows. Note, SILT soils with low to non-plastic behavior (i.e. PI < 7) are classified using relative density.

Consistency Term	SPT N-value	Unconfined Compressive Strength tsf	Unconfined Compressive Strength kPa
Very soft	Less than 2	Less than 0.25	Less than 24
Soft	2 – 4	0.25 - 0.5	24 - 48
Medium stiff	5 – 8	0.5 - 1.0	48 – 96
Stiff	9 – 15	1.0 - 2.0	96 – 192
Very stiff	16 – 30	2.0 - 4.0	192 – 383
Hard	Over 30	Over 4.0	Over 383

PBS

Table A-1
Terminology Used to Describe Soil

Soil Descriptions

Coarse - Grained Soils (less than 50% fines)
Coarse-grained soil descriptions, i.e., SAND or GRAVEL, are based on that portion of materials passing a 3-inch (75mm) sieve. Coarse-grained soil group symbols are applied in accordance with ASTM D2488-06 based upon the degree of grading, or distribution of grain sizes of the soil. For example, well graded sand containing a wide range of grain sizes is designated SW; poorly graded gravel, GP, contains high percentages of only certain grain sizes. Terms applied to grain sizes follow.

Material	Particle Diameter	
	Inches	Millimeters
Sand (S)	0.003 - 0.19	0.075 - 4.8
Gravel (G)	0.19 - 3.0	4.8 - 75
	Additional Constituents	
Cobble	3.0 - 12	75 - 300
Boulder	12 - 120	300 - 3050

The primary soil type is capitalized, and the amount of fines in the soil are described as indicated by the following examples. Other soil mixtures will provide similar descriptive names.

Example: Coarse-Grained Soil Descriptions with Fines

5% to less than 15% fines (Dual Symbols)	15% to less than 50% fines
GRAVEL with silt, GW-GM	Silty GRAVEL: GM
SAND with clay, SP-SC	Silty SAND: SM

Additional descriptive terminology applied to coarse-grained soils follow.

Example: Coarse-Grained Soil Descriptions with Other Coarse-Grained Constituents

Coarse-Grained Soil Containing Secondary Constituents	
With sand or with gravel	> 15% sand or gravel
With cobbles; with boulders	Any amount of cobbles or boulders.

Cobble and boulder deposits may include a description of the matrix soils, as defined above.

Relative Density terms are applied to granular, non-plastic soils based on direct measure or correlation to the Standard Penetration Test N-value as determined by ASTM D1586-84.

Relative Density Term	SPT N-value
Very loose	0 - 4
Loose	5 - 10
Medium dense	11 - 30
Dense	31 - 50
Very dense	> 50

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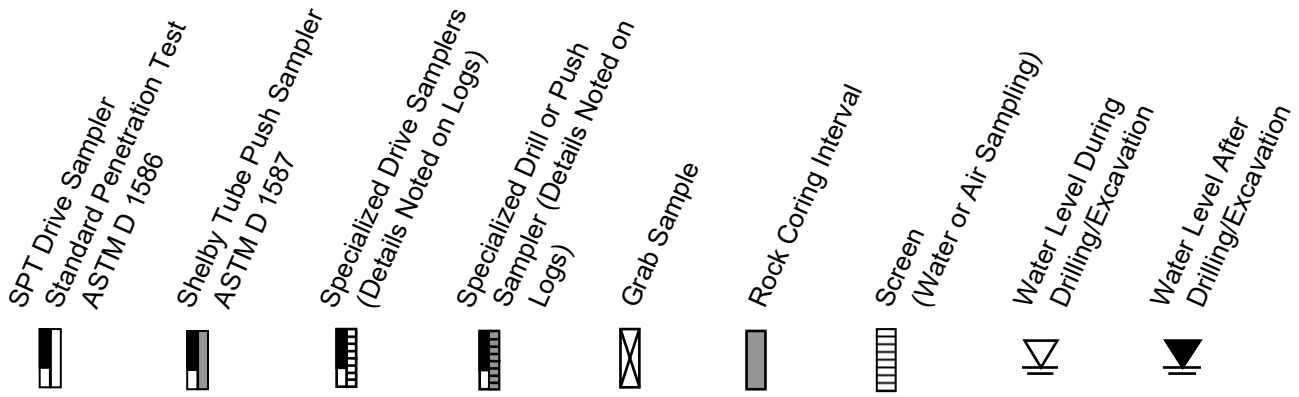
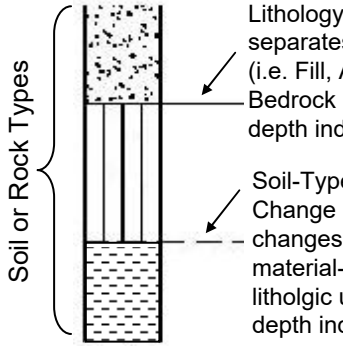
Table A-2
Key To Test Pit and Boring Log Symbols

SAMPLING DESCRIPTIONS[1]

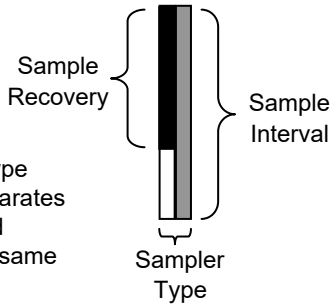


LOG GRAPHICS

Soil and Rock



Sampling Symbols



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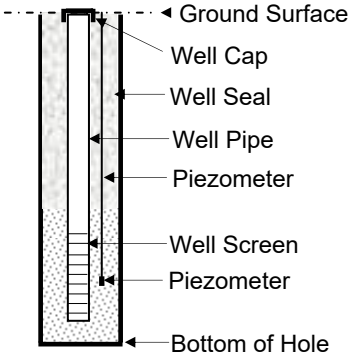

Geotechnical Testing/Acronym Explanations

PP	Pocket Penetrometer	LL	Liquid Limit
DD	Dry Density	ATT	Atterberg Limits
DCP	Dynamic Cone Penetrometer	SIEV	Sieve Gradation
TOR	Torvane	CBR	California Bearing Ratio
CON	Consolidation	OC	Organic Content
DS	Direct Shear	RES	Resilient Modulus
P200	Percent Passing U.S. Standard No. 200 Sieve	VS	Vane Shear
UC	Unconfined Compressive Strength	HYD	Hydrometer Gradation
PL	Plasticity Limit	bgs	Below ground surface
PI	Plasticity Index	MSL	Mean Sea Level

[1]Note: Details of soil and rock classification systems are available on request.

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Fax: 866.727.0140

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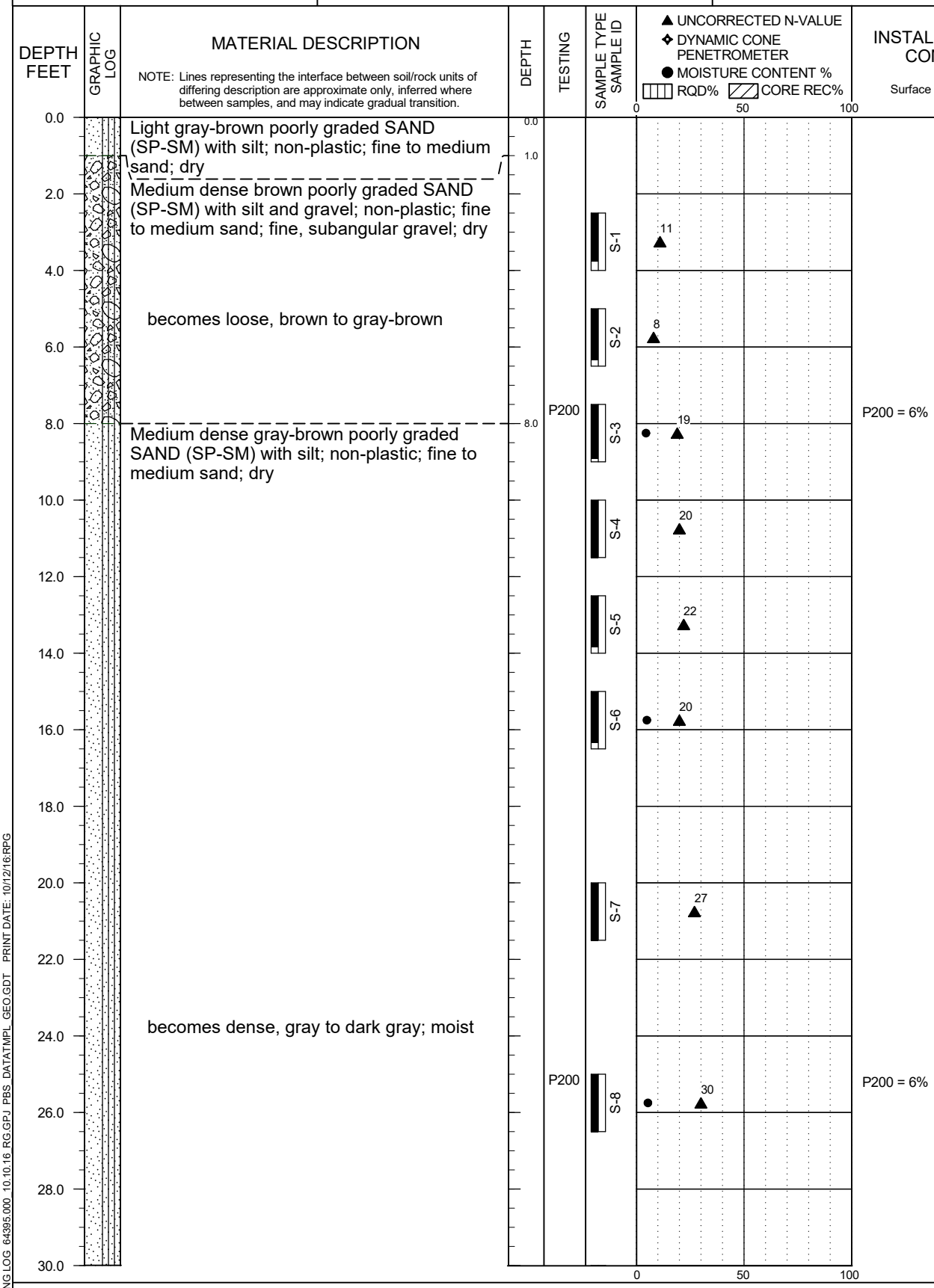
PBS PROJECT NUMBER:
64395.000

BORING B-1

APPROX. BORING B-1 LOCATION:
Lat. 46.33048, Long. -119.31230



DRILLING METHOD: Hollow-Stem Auger
DRILLED BY: Haztech Drilling
LOGGED BY: A. Swenson

BIT DIAMETER: 6 inches
HAMMER EFFICIENCY PERCENT: 85
LOGGING COMPLETED: 9/14/16

FIGURE A1

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Fax: 866.727.0140

WASHINGTON ARMY NATIONAL GUARD BUILDING
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PBS PROJECT NUMBER:
64395.000

BORING B-1
(continued)

APPROX. BORING B-1 LOCATION:
Lat. 46.33048, Long. -119.31230

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE SAMPLE ID	UNCORRECTED N-VALUE / DYNAMIC CONE PENETROMETER / MOISTURE CONTENT % / RQD% / CORE REC%	INSTALLATION AND COMMENTS
30.0		Dense gray-brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; moist	30.0		S-9	31	Surface Conditions: Shrubs
32.0		becomes gray to dark gray					
34.0					S-10	34	
36.0							
38.0		Medium dense dark gray to black poorly graded SAND (SP) with gravel; fine to coarse sand; fine, subrounded gravel; dry	38.0				
40.0				P200	S-11	29	P200 = 4%
42.0							
44.0							
46.0					S-12	24	
48.0		Very dense dark gray poorly graded GRAVEL (GP) with sand; fine to coarse sand; fine to coarse, rounded gravel; dry	48.0				Slow drilling; rig chatter
50.0		Final depth 50.1 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.	50.1		S-13	50/2	No recovery
52.0							
54.0							
56.0							
58.0							
60.0							

NOTE: Lines representing the interface between soil/rock units of differing description are approximate only, inferred where between samples, and may indicate gradual transition.

0 50 100

BORING LOG 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

DRILLING METHOD: Hollow-Stem Auger
DRILLED BY: Haztech Drilling
LOGGED BY: A. Swenson

BIT DIAMETER: 6 inches
HAMMER EFFICIENCY PERCENT: 85
LOGGING COMPLETED: 9/14/16

FIGURE A1

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BORING B-2

PBS PROJECT NUMBER:
64395.000

APPROX. BORING B-2 LOCATION:
Lat. 46.33137, Long. -119.31186

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE SAMPLE ID	UNCORRECTED N-VALUE / DYNAMIC CONE PENETROMETER / MOISTURE CONTENT % / RQD% / CORE REC%	INSTALLATION AND COMMENTS
0.0		Medium dense light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Surface Conditions: Shrubs
2.0		becomes olive brown			S-1	13	
4.0				P200	S-2	10	P200 = 9%
6.0							
8.0					S-3	17	
10.0		becomes gray-brown			S-4	26	
12.0					S-5	14	
14.0							
16.0					S-6	14	
18.0							
20.0		Medium dense gray-brown poorly graded SAND (SP); fine to medium sand; dry	20.0	P200	S-7	13	P200 = 3%
22.0							
24.0							
26.0					S-8	29	
28.0							
30.0							

NOTE: Lines representing the interface between soil/rock units of differing description are approximate only, inferred where between samples, and may indicate gradual transition.

0 50 100

DRILLING METHOD: Hollow-Stem Auger
DRILLED BY: Haztech Drilling
LOGGED BY: A. Swenson

BIT DIAMETER: 6 inches
HAMMER EFFICIENCY PERCENT: 85
LOGGING COMPLETED: 9/14/16

FIGURE A2

BORING LOG 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

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PBS PROJECT NUMBER:
64395.000

BORING B-2
(continued)

APPROX. BORING B-2 LOCATION:
Lat. 46.33137, Long. -119.31186

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE SAMPLE ID	UNCORRECTED N-VALUE / DYNAMIC CONE PENETROMETER / MOISTURE CONTENT % / RQD% / CORE REC% (0 – 50 – 100)	INSTALLATION AND COMMENTS
30.0		NOTE: Lines representing the interface between soil/rock units of differing description are approximate only, inferred where between samples, and may indicate gradual transition.					Surface Conditions: Shrubs
		Dense gray poorly graded SAND (SP); fine to coarse sand; moist	30.0		S-9	39	
32.0							
34.0		becomes dark gray to black			S-10	31	
36.0							
38.0							
		Medium dense dark gray to black poorly graded SAND (SP) with gravel; fine to coarse sand; fine to coarse, subrounded gravel; dry	39.0		S-11	21	
40.0							
42.0		Very dense dark gray to black poorly graded GRAVEL (GP) with sand; fine to coarse sand; fine to coarse, subrounded gravel; dry	42.0				Slow drilling; rig chatter
44.0				P200	S-12	58	P200 = 6%
46.0							
48.0							
50.0					S-13	9-40-50/5	
52.0		Final depth 51.4 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.	51.4				
54.0							
56.0							
58.0							
60.0							

DRILLING METHOD: Hollow-Stem Auger
DRILLED BY: Haztech Drilling
LOGGED BY: A. Swenson

BIT DIAMETER: 6 inches
HAMMER EFFICIENCY PERCENT: 85
LOGGING COMPLETED: 9/14/16

FIGURE A2

BORING LOG 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

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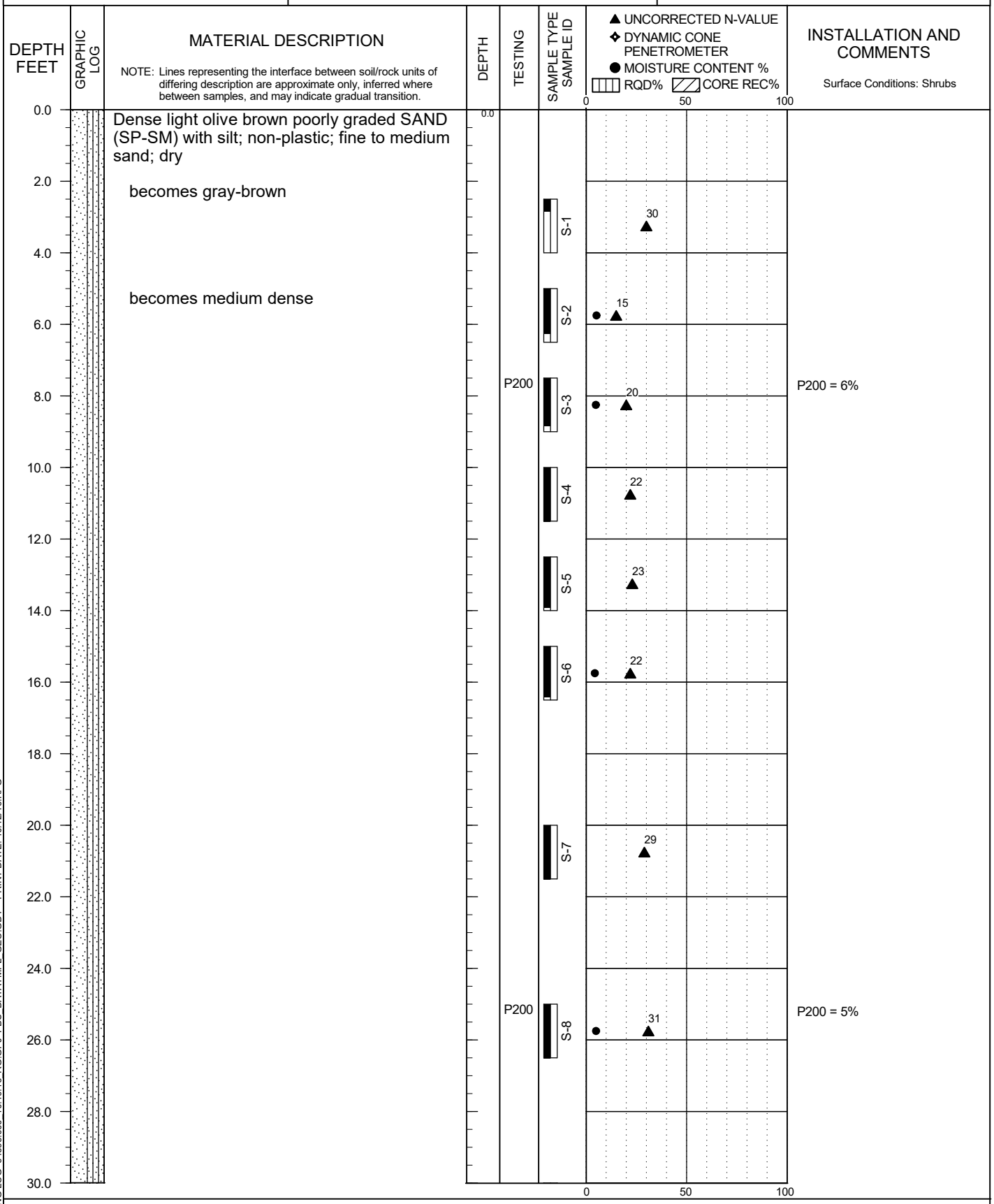
BORING B-3

APPROX. BORING B-3 LOCATION:
Lat. 46.33195, Long. -119.31360



DRILLING METHOD: Hollow-Stem Auger
DRILLED BY: Haztech Drilling
LOGGED BY: A. Swenson

BIT DIAMETER: 6 inches
HAMMER EFFICIENCY PERCENT: 85
LOGGING COMPLETED: 9/14/16

FIGURE A3

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BORING B-3
(continued)

APPROX. BORING B-3 LOCATION:
Lat. 46.33195, Long. -119.31360

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	UNCORRECTED N-VALUE / DYNAMIC CONE PENETROMETER / MOISTURE CONTENT % / RQD% / CORE REC%	INSTALLATION AND COMMENTS
30.0		Dense gray-brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	30.0		S-9	39	
32.0							
34.0							
		Dense dark gray to black poorly graded SAND (SP) with gravel; fine to coarse sand; fine, rounded to subrounded gravel; dry	35.0		S-10	33	
36.0							
38.0							
40.0		becomes moist			S-11	33	
42.0							Rig chatter
44.0				P200			
46.0					S-12	38	P200 = 3%
48.0							
		Very dense olive brown poorly graded GRAVEL (GP) with sand; fine to coarse sand; fine to coarse, rounded to subrounded gravel; moist	49.0				Rig chatter
50.0					S-13	66	
		Final depth 51.5 feet bgs; boring backfilled with bentonite. Groundwater not encountered at time of exploration.	51.5				
52.0							
54.0							
56.0							
58.0							
60.0							

NOTE: Lines representing the interface between soil/rock units of differing description are approximate only, inferred where between samples, and may indicate gradual transition.

Surface Conditions: Shrubs

DRILLING METHOD: Hollow-Stem Auger
DRILLED BY: Haztech Drilling
LOGGED BY: A. Swenson

BIT DIAMETER: 6 inches
HAMMER EFFICIENCY PERCENT: 85
LOGGING COMPLETED: 9/14/16

FIGURE A3

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TEST PIT TP-1

APPROX. TEST PIT TP-1 LOCATION:
(See Site Plan)

Lat: 46.33012 Long: -119.31310

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium dense light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Surface Conditions: Grass and Brush
2.0		becomes gray-brown		P200 DCP	S-1	11	P200 = 6%
3.0		Medium dense gray poorly graded SAND (SP); fine to coarse sand; dry	3.0				
4.0					S-2	●	
6.0							
8.0							
10.0							
12.0							
14.0							
16.0		Final depth 16.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	16.0				
18.0							
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A4
Page 1 of 1

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PBS PROJECT NUMBER:
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TEST PIT TP-2

APPROX. TEST PIT TP-2 LOCATION:
(See Site Plan)

Lat: 46.33017 Long: -119.31200

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Surface Conditions: Grass and Brush Caving from 1 to 11 feet bgs
2.0		becomes light gray-brown					
		Medium dense gray-brown poorly graded SAND (SP); fine to medium sand; dry	3.0	DCP	S-1	14	
4.0							
6.0		becomes moist					
8.0							
10.0							
		Final depth 11.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	11.0				
12.0							
14.0							
16.0							
18.0							
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A5
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

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PBS PROJECT NUMBER:
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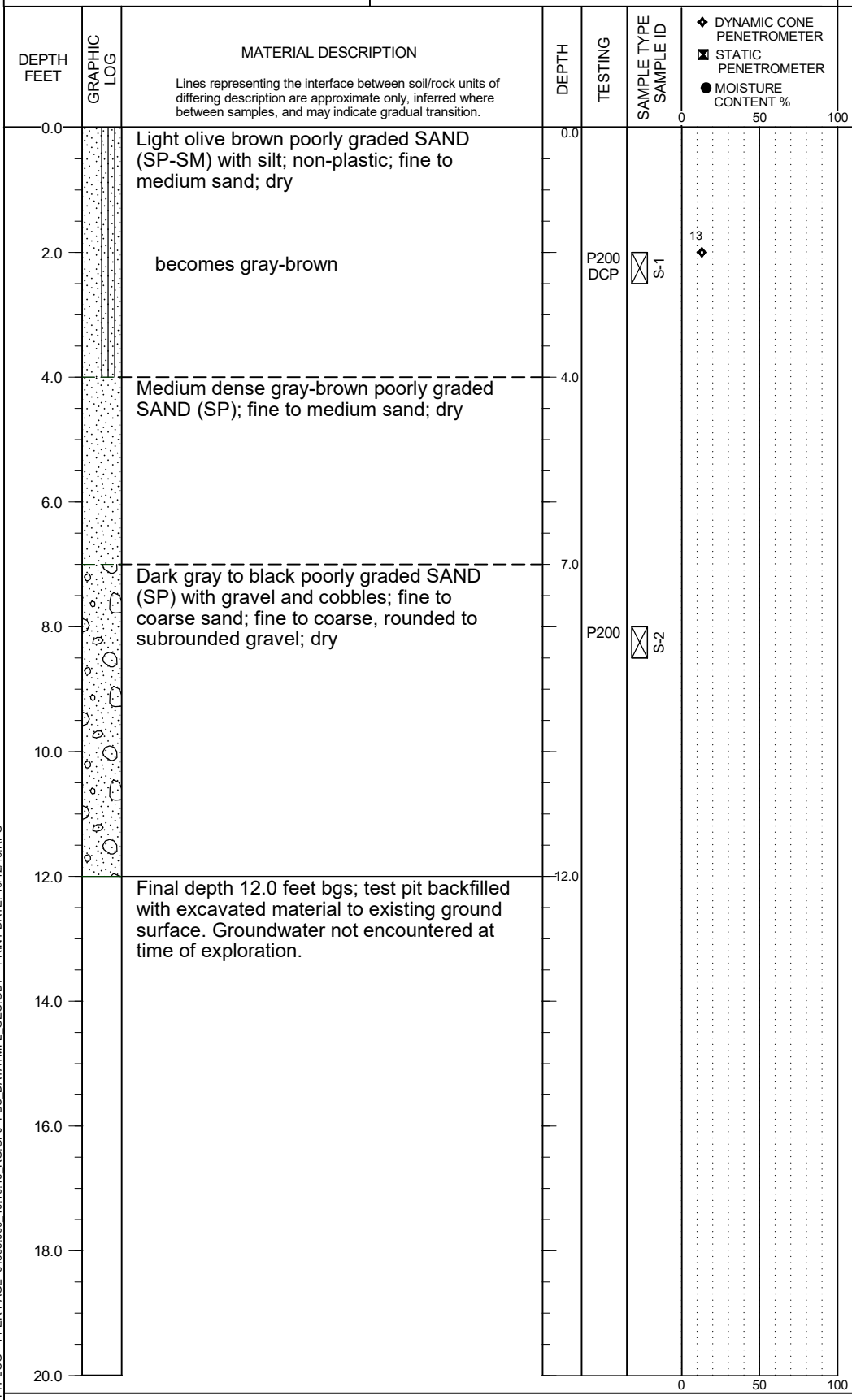
TEST PIT TP-3

APPROX. TEST PIT TP-3 LOCATION:
(See Site Plan)

Lat: 46.33053 Long: -119.30938



LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A6
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

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PBS PROJECT NUMBER:
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TEST PIT TP-4

APPROX. TEST PIT TP-4 LOCATION:
(See Site Plan)

Lat: 46.33143 Long: -119.30967

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium dense light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Surface Conditions: Grass and Brush
2.0		becomes gray-brown					
4.0				DCP	S-1	12	
6.0		Medium dense dark gray to black poorly graded SAND (SP); fine to medium sand; moist	6.0				
		Light yellow-gray VOLCANIC ASH with sand; non-plastic; fine sand; moist	7.0	P200	S-2		P200 = 69%
8.0		Dark gray to black poorly graded SAND (SP); fine to medium sand; moist	8.0				
10.0							
12.0							
14.0							
16.0							
17.0		Final depth 17.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	17.0				
18.0							
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A7
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

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PBS PROJECT NUMBER:
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TEST PIT TP-5

APPROX. TEST PIT TP-5 LOCATION:
(See Site Plan)

Lat: 46.33130 Long: -119.31069

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium dense light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Surface Conditions: Grass and Brush
2.0		becomes brown		DCP	S-1	14	
4.0		becomes gray-brown; moist					
6.0		becomes fine to coarse sand					
7.0		Dark gray to black poorly graded SAND (SP); fine to coarse sand; moist	7.0				
8.0							
10.0							
12.0		Final depth 12.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	12.0				
14.0							
16.0							
18.0							
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A8
Page 1 of 1

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PBS PROJECT NUMBER:
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TEST PIT TP-6

APPROX. TEST PIT TP-6 LOCATION:
(See Site Plan)

Lat: 46.33079 Long: -119.31253

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Lines representing the interface between soil/rock units of differing description are approximate only, inferred where between samples, and may indicate gradual transition.	0.0				Surface Conditions: Grass and Brush
		Light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry					Caving at 1 foot bgs
2.0		Light brown poorly graded SAND (SP-SM) with silt and gravel; non-plastic; fine to medium sand; coarse, rounded to subrounded gravel; dry	2.0				
			3.0				Cobbles at 3 feet bgs
4.0		Loose dark gray to black poorly graded SAND (SP); fine to coarse sand; dry		P200 DCP	S-1	6	P200 = 1%
6.0							
8.0							
10.0							
12.0		Final depth 12.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	12.0				
14.0							
16.0							
18.0							
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A9
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

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PBS PROJECT NUMBER:
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TEST PIT TP-7

APPROX. TEST PIT TP-7 LOCATION:
(See Site Plan)

Lat: 46.33117 Long: -119.31398

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Surface Conditions: Grass and Brush
2.0		Medium dense gray-brown poorly graded SAND (SP-SM) with silt, gravel, and cobbles; non-plastic; fine to medium sand; coarse, rounded to subangular gravel; dry	2.0	DCP	S-1	15	
7.0		Gray poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	7.0				
17.0		Final depth 17.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	17.0				
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A10
Page 1 of 1

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TEST PIT TP-8

APPROX. TEST PIT TP-8 LOCATION:
(See Site Plan)

Lat: 46.33247 Long: -119.31290

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Medium dense light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Surface Conditions: Grass and Brush
		becomes brown					Caving from 1 to 7 feet bgs
2.0				DCP	S-1	14	
4.0		Loose gray-brown poorly graded SAND (SP-SM) with silt and gravel; fine to coarse sand; fine to coarse, rounded to subrounded gravel; dry	4.0	DCP	S-2	9	
6.0							Infiltration testing at 6 feet bgs
		Dark gray to black poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	7.0				
8.0							
10.0							
12.0		Final depth 12.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	12.0				
14.0							
16.0							
18.0							
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A11
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

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TEST PIT TP-9

APPROX. TEST PIT TP-9 LOCATION:
(See Site Plan)

Lat: 46.33236 Long: -119.31144

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION Lines representing the interface between soil/rock units of differing description are approximate only, inferred where between samples, and may indicate gradual transition.	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS Surface Conditions: Grass and Brush
0.0		Medium dense light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Caving from 1 to 15 feet bgs
2.0		becomes gray-brown		P200 DCP	S-1	14	P200 = 15%
4.0							
6.0							
8.0		becomes moist					
10.0							
12.0		becomes dark gray to black					
14.0							
		Final depth 15.0 feet bgs; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	15.0				
16.0							
18.0							
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A12
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

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TEST PIT TP-10

APPROX. TEST PIT TP-10 LOCATION:
(See Site Plan)

Lat: 46.33230 Long: -119.31008

DEPTH FEET	GRAPHIC LOG	MATERIAL DESCRIPTION	DEPTH	TESTING	SAMPLE TYPE / SAMPLE ID	DYNAMIC CONE PENETROMETER / STATIC PENETROMETER / MOISTURE CONTENT % (0 50 100)	COMMENTS
0.0		Light olive brown poorly graded SAND (SP-SM) with silt; non-plastic; fine to medium sand; dry	0.0				Surface Conditions: Grass and Brush Caving from 1 to 8 feet bgs
2.0		becomes medium dense, brown; weak cementation					
4.0				DCP	S-1	13	
6.0		becomes dark gray to black; fine to coarse sand					
8.0		Final depth 8.0 feet bgs due to caving; test pit backfilled with excavated material to existing ground surface. Groundwater not encountered at time of exploration.	8.0				
10.0							
12.0							
14.0							
16.0							
18.0							
20.0							

LOGGED BY: A. Swenson
COMPLETED: 9/20/16

EXCAVATED BY: Mahaffey Enterprises, Inc.
EXCAVATION METHOD: CAT 320C with 36" Bucket

FIGURE A13
Page 1 of 1

TEST PIT LOG - 1 PER PAGE 64395.000 10.10.16 RG.GPJ PBS_DATATMPL_GEO.GDT PRINT DATE: 10/12/16:RPG

APPENDIX B

Laboratory Testing

APPENDIX B – LABORATORY TESTING

B1.0 GENERAL

Samples obtained during the field explorations were examined in the PBS laboratory. The physical characteristics of the samples were noted and the field classifications were modified where necessary. The testing procedures are presented in the following paragraphs. Unless noted otherwise, all test procedures are in general accordance with applicable ASTM standards. “General accordance” means that certain local and common descriptive practices and methodologies have been followed.

B2.0 CLASSIFICATION TESTS

B2.1 Visual Classification

The soils were classified in accordance with the Unified Soil Classification System with certain other terminology, such as the relative density or consistency of the soil deposits, in general accordance with engineering practice. In determining the soil type (that is, gravel, sand, silt, or clay) the term that best described the major portion of the sample is used. Modifying terminology to further describe the samples is defined in Terminology Used to Describe Soil in Appendix A.

B2.2 Moisture (Water) Contents

Natural moisture content determinations were made on samples. The natural moisture content is defined as the ratio of the weight of water to dry weight of soil, expressed as a percentage. The results of the moisture content determinations are presented on Figure B1, Summary of Laboratory Data, and on the exploration logs in Appendix A.

B2.4 Grain-Size Analyses (P200 Wash)

No. 200 wash (P200) analyses were completed on samples to determine the portion of soil samples passing the No. 200 Sieve (i.e., silt and clay). The results of the P200 test results are presented on Figure B1 and on the exploration logs in Appendix A.

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SUMMARY OF LABORATORY DATA

WASHINGTON ARMY NATIONAL GUARD BUILDING
RICHLAND, WASHINGTON

PBS PROJECT NUMBER:
64395.000

SAMPLE INFORMATION						SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)	MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT (PERCENT)	PLASTIC LIMIT (PERCENT)	PLASTICITY INDEX (PERCENT)
B-1	S-3	7.5		4.4				6			
B-1	S-6	15		4.8							
B-1	S-8	25		5.3				6			
B-1	S-11	40		3.7				4			
B-1	S-12	45		4.7							
B-2	S-2	5		4.6				9			
B-2	S-4	10		5.4							
B-2	S-7	20		4.1				3			
B-2	S-10	35		5.0							
B-2	S-12	45		2.5				6			
B-3	S-2	5		5.1							
B-3	S-3	7.5		4.8				6			
B-3	S-6	15		4.3							
B-3	S-8	25		4.9				5			
B-3	S-10	35		3.8							
B-3	S-12	45		2.9				3			
TP-1	S-1	2		2.7				6			
TP-1	S-2	4		4.5							
TP-2	S-1	4		5.0							
TP-3	S-1	2		3.8				9			
TP-3	S-2	8		3.6				2			
TP-4	S-1	4		4.3							
TP-4	S-2	7		79.4				69			
TP-5	S-1	2		5.0							
TP-6	S-1	4		3.7				1			
TP-7	S-1	2		4.2							
TP-8	S-2	4		5.0							
TP-9	S-1	2		5.1				15			

FIGURE B1

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SUMMARY OF LABORATORY DATA
(continued)

WASHINGTON ARMY NATIONAL GUARD BUILDING
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PBS PROJECT NUMBER:
64395.000

SAMPLE INFORMATION				MOISTURE CONTENT (PERCENT)	DRY DENSITY (PCF)	SIEVE			ATTERBERG LIMITS		
EXPLORATION NUMBER	SAMPLE NUMBER	SAMPLE DEPTH (FEET)	ELEVATION (FEET)			GRAVEL (PERCENT)	SAND (PERCENT)	P200 (PERCENT)	LIQUID LIMIT (PERCENT)	PLASTIC LIMIT (PERCENT)	PLASTICITY INDEX (PERCENT)
TP-10	S-1	4		8.0							

FIGURE B1
Page 2 of 2

PBS | Engineering + Environmental

October 20, 2016

Ron Cross
Washington State Military Department
Army National Guard
Camp Murray Bldg 36
Tacoma, Washington 98340

Re: Limited Environmental Site Assessment
Benton County Parcel 121084000006003
1st Street, Richland, Washington
PBS Project No.64395.000

Dear Mr. Cross:

PBS Engineering and Environmental Inc. (PBS) is providing this letter to address soil sampling conducted at the above-referenced parcel located in Richland, Washington (Figure 1). The sampling was conducted to assess potential presence of pesticides in shallow soil related to historical agricultural use.

Sampling was conducted in conjunction with the excavation of test pits for a geotechnical engineering evaluation.

Field Sampling
The scope of work consisted of collecting discrete soil samples from the upper foot of soil at ten test pit locations (TP-1 through TP-10) at the site. The test pits were advanced for the primary purpose of collecting geotechnical information, and their locations are shown on Figure 2 (samples were not collected at soil boring locations labeled with B-1, etc).

Samples were collected directly from the excavator bucket. All samples were placed in sterile laboratory-provided containers, sealed with Teflon lids, and stored on ice for the duration of fieldwork and for transportation to the laboratory under chain-of-custody.

Investigation Derived Waste
Soil sampling residuals were returned to the test pits. Disposable gloves were disposed of as solid waste.

Laboratory Analysis and Findings
Ten soil samples were analyzed for seventeen agricultural metals by Environmental Protection Agency (EPA) Methods 6010 and 7471, pesticides by EPA Methods 8081 and 8141, and chlorinated acid herbicides by EPA Method 8151.

Table 1 summarizes the soil analytical results for compounds detected in one or more soil samples. No detectable levels of pesticides and herbicides were found in the soil samples. Arsenic, barium,

beryllium chromium, cobalt, copper, lead, nickel, vanadium, and zinc were detected in soil samples. Analytical results were compared to Washington State Department of Ecology's (Ecology) Model Toxics Control Act (MTCA) Method A cleanup values and Table 1 of Ecology's Natural Background Soil Metals Concentrations in Washington State (Publication No. 94-115, October 1994 document). The laboratory report is provided as an attachment. The levels of arsenic, beryllium, chromium, copper, lead, nickel, and zinc detected were below both the MTCA Method A cleanup values (if established) and applicable state background levels. Although there is not a MTCA Method A cleanup level or a state background level for the remaining detected metals (barium, cobalt, and vanadium, the low concentrations of these metals are not indicative of levels associated with pesticide application and do not appear to present a concern.

Conclusions and Recommendations

Based on the results of this investigation, it is PBS' opinion that no evidence of soil contamination related to historical agricultural activities is present in near surface soil at the site. Further evaluation with regards to historical agricultural pesticide use is not recommended at this time.

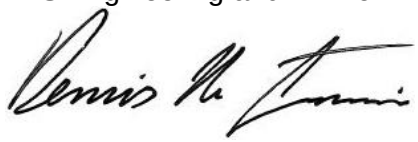
Limitations

PBS has prepared this report for use by Army National Guard (Client). This report is for the exclusive use of the Client and is not to be relied upon by other parties. It is not to be photographed, photocopied, or similarly reproduced, in total or in part, without the expressed written consent of the Client and PBS.

This study was limited to the tests, locations, and depths as indicated to determine the absence or presence of certain contaminants. The site as a whole may have other contamination that was not characterized by this study. The findings and conclusions of this report are not scientific certainties, but probabilities based on professional judgment concerning the significance of the data gathered during the course of this investigation. PBS is not able to represent that the site or adjoining land contain no hazardous waste, oil or other latent conditions beyond that detected or observed by PBS.

Please contact Dennis Terzian at 503.417.7601 if you have any questions regarding this assessment. Other questions regarding this site should be directed to Adam Swenson at 509.375.7844.

Sincerely,
PBS Engineering and Environmental Inc.

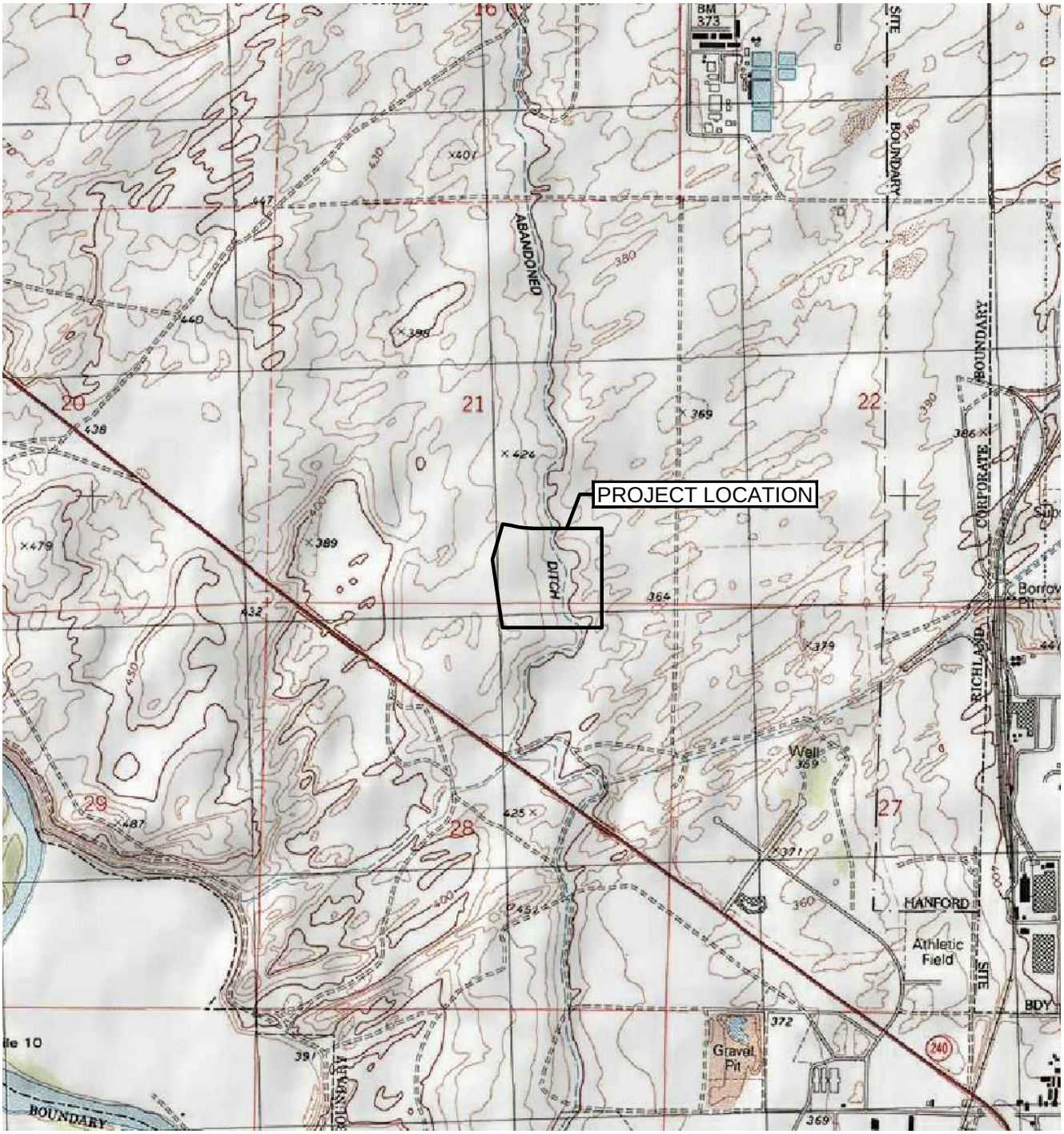


Dennis M. Terzian, LG
Senior Geologist

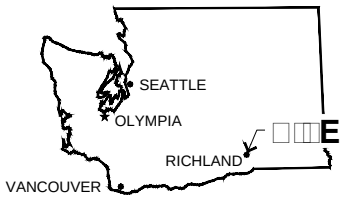
Attachments: Figure 1 – Vicinity Map
Figure 2 – Site Plan
Table 1 – Soil Analytical Results
Laboratory Report and Sample Chain-of-Custody Forms

DT:HY:bmp

FIGURES



SOURCE: USGS RICHLAND WA QUADRANGLE 1992, PHOTO REVISED 1990.



0' 1,000' 2,000' 4,000'

SCALE: 1" = 2,000'

PREPARED FOR: WASHINGTON STATE ARMY NATIONAL GUARD

PBS	PROJECT # 64395.000 DATE OCT 2016	VICINITY MAP WASHINGTON ARMY NATIONAL GUARD BUILDING RICHLAND, WASHINGTON	FIGURE

L:\Projects\64000\64300-64399\64395_CFMO\DWG\64395.000_FIG 1-2.dwg Oct 10, 2016 03:51pm jimb

SOURCE: © 2016 GOOGLE EARTH PRO.

LEGEND

TP-1	TEST PIT NUMBER AND LOCATION
B-1	BORING NUMBER AND LOCATION

0' 150' 300' 600'

SCALE: 1" = 300'

PREPARED FOR: WASHINGTON STATE ARMY NATIONAL GUARD

PBS

PROJECT # 64395.000

DATE OCT 2016

SITE PLAN

WASHINGTON ARMY NATIONAL GUARD BUILDING
RICHLAND, WASHINGTON

FIGURE 2

L:\Projects\64000\64300-64399\64395_CFMO\DWG\64395.000_FIG 1-2.dwg Oct 10, 2016 03:53pm jimb

TABLE

Table 1: Soil Analytical Results
Richland Army National Guard Building
Richland, Washington

		Metals (limited to detections)									
Sample ID	**Sampling Date**	**Arsenic**	**Barium**	**Beryllium**	**Chromium[2]**	**Cobalt**	**Copper**	**Lead**	**Nickel**	**Vanadium**	**Zinc**
TP-1	10/10/2016	3.01	87.3	0.395	9.86	11.8	10.9	5.92	10.8	53.7	66.6
TP-2	10/10/2016	2.3	75.3	0.332	7.85	10.1	8.39	4.73	10.1	46.6	58.8
TP-3	10/10/2016	<2.02	72.2	0.297	7.17	8.79	8.95	5.52	8.06	31.7	72.2
TP-4	10/4/2016	2.8	81.4	0.334	8.39	11	8.5	5.18	10.2	52	58.5
TP-5	10/4/2016	2.84	71.6	0.368	10.6	11.9	10.4	5.15	11.4	60.8	65.6
TP-6	10/4/2016	2.24	85.4	0.396	11.5	12.3	9.1	5.86	11.3	60.2	64.2
TP-7	10/4/2016	2.45	86.3	0.384	10.5	12.3	9.79	5.06	10.4	63	58.7
TP-8	10/4/2016	2.31	82.1	0.382	10.5	12	9.25	5.3	10.4	60.3	60.4
TP-9	10/4/2016	2.79	82.7	0.389	11.9	12.1	7.99	5.53	11.2	59.8	61
TP-10	10/4/2016	2.63	72.5	0.352	9.8	11.4	8.87	5.2	10.6	55.9	54.1
MTCA Methods A (Unrestricted Land Use)		20	NE	NE	2,000	NE	NE	250	NE	NE	NE
Washington Background Concentration[1]		7	NE	2	42	NE	36	17	38	NE	86

See laboratory report for full list of analytes
MTCA = Model Toxics Control Act
NE = not established
All analyses measured total metals (no valence states)
Concentrations in milligrams per kilograms (mg/kg)
[1] Washington Department of Ecology, Natural Background Soil Metals Concentrations in Washington State, October 1994, Table 1
[2] Using cleanup value for chromium III

LABORTORY REPORT AND CHAIN OF CUSTODY

ANALYTICAL REPORT

October 13, 2016

PBS Engineering & Env.- WA

Sample Delivery Group:	L864107
Samples Received:	10/05/2016
Project Number:	64395.000
Description:	Richland Army National Guard Building

Report To:

Adam Swenson
400 Bradley Blvd
Suite 300
Richland, WA 99352

Entire Report Reviewed By:

Brian Ford
Technical Service Representative

TP-1 L864107-01 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 07:53 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 01:19	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 10:45	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:11	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:06	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 14:15	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 12:03	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-2 L864107-02 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 08:03 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 02:01	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:14	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:19	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:09	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 14:47	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 12:43	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-3 L864107-03 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 08:27 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 02:15	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:17	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:21	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:18	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 15:19	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 12:56	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-4 L864107-04 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 08:51 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 02:28	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:20	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:24	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:21	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 15:50	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 13:09	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-5 L864107-05 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 09:00 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 02:42	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:23	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:27	LTB

TP-5 L864107-05 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 09:00 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:24	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 16:22	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 13:22	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-6 L864107-06 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 10:14 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 02:56	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:26	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:29	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:27	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 16:53	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 13:35	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-7 L864107-07 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 10:07 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 03:10	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:29	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:32	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:30	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 17:25	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 13:48	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-8 L864107-08 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 09:56 | Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 03:24	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:32	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:34	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:33	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 19:00	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 14:02	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-9 L864107-09 Solid

Collected by: Adam Swenson | Collected date/time: 10/04/16 09:09 | Received date/time: 10/05/16 09:00

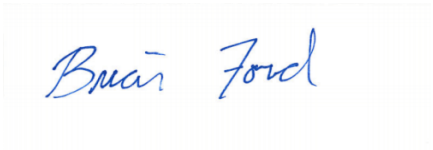
Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 03:37	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:35	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:37	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:36	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 19:31	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 14:15	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

TP-10 L864107-10 Solid

Collected by: Adam Swenson
Collected date/time: 10/04/16 09:22
Received date/time: 10/05/16 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst
Chlorinated Acid Herbicides (GC) by Method 8151	WG915615	1	10/10/16 09:20	10/12/16 03:51	KLM
Mercury by Method 7471A	WG914418	1	10/05/16 20:34	10/07/16 11:38	NJB
Metals (ICP) by Method 6010C	WG915060	1	10/07/16 15:53	10/10/16 11:40	LTB
Metals (ICP) by Method 6010C	WG916216	1	10/11/16 18:20	10/12/16 12:39	LTB
OP Pesticides by Method 8141	WG916127	1	10/11/16 17:46	10/12/16 20:03	ADF
Pesticides (GC) by Method 8081	WG915301	1	10/08/16 01:51	10/10/16 14:28	VKS
Total Solids by Method 2540 G-2011	WG914939	1	10/07/16 09:54	10/07/16 10:02	MEL

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times. All MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.



Brian Ford
Technical Service Representative

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	98.8		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0202	1	10/07/2016 10:45	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.02	1	10/10/2016 11:11	WG915060
Arsenic	3.01		2.02	1	10/10/2016 11:11	WG915060
Barium	87.3		0.506	1	10/10/2016 11:11	WG915060
Beryllium	0.395		0.202	1	10/10/2016 11:11	WG915060
Cadmium	ND		0.506	1	10/10/2016 11:11	WG915060
Chromium	9.86		1.01	1	10/10/2016 11:11	WG915060
Cobalt	11.8		1.01	1	10/10/2016 11:11	WG915060
Copper	10.9		2.02	1	10/10/2016 11:11	WG915060
Lead	5.92		0.506	1	10/10/2016 11:11	WG915060
Molybdenum	ND		0.506	1	10/10/2016 11:11	WG915060
Nickel	10.8		2.02	1	10/10/2016 11:11	WG915060
Selenium	ND		2.02	1	10/10/2016 11:11	WG915060
Silver	ND		1.01	1	10/10/2016 11:11	WG915060
Thallium	ND		2.02	1	10/10/2016 11:11	WG915060
Vanadium	53.7		2.02	1	10/10/2016 11:11	WG915060
Zinc	66.6		5.06	1	10/12/2016 12:06	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND	J5	0.0708	1	10/12/2016 01:19	WG915615
Dalapon	ND		0.0708	1	10/12/2016 01:19	WG915615
2,4-DB	ND	J4 J5	0.0708	1	10/12/2016 01:19	WG915615
Dicamba	ND		0.0708	1	10/12/2016 01:19	WG915615
Dichloroprop	ND		0.0708	1	10/12/2016 01:19	WG915615
Dinoseb	ND		0.0708	1	10/12/2016 01:19	WG915615
MCPA	ND		6.58	1	10/12/2016 01:19	WG915615
MCPP	ND	J5	6.58	1	10/12/2016 01:19	WG915615
2,4,5-T	ND		0.0708	1	10/12/2016 01:19	WG915615
2,4,5-TP (Silvex)	ND		0.0708	1	10/12/2016 01:19	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*100*		*15.0-122*		*10/12/2016 01:19*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 14:15	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 14:15	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 14:15	WG916127
Coumaphos	ND		0.101	1	10/12/2016 14:15	WG916127
Demeton,-O and -S	ND		0.0708	1	10/12/2016 14:15	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 14:15	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 14:15	WG916127
Dimethoate	ND		0.101	1	10/12/2016 14:15	WG916127
Disulfoton	ND		0.101	1	10/12/2016 14:15	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 14:15	WG916127
Ethoprop	ND		0.101	1	10/12/2016 14:15	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 14:15	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 14:15	WG916127
Fenthion	ND		0.101	1	10/12/2016 14:15	WG916127
Malathion	ND		0.101	1	10/12/2016 14:15	WG916127
Merphos	ND		0.101	1	10/12/2016 14:15	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 14:15	WG916127
Mevinphos	ND		0.101	1	10/12/2016 14:15	WG916127
Naled	ND	J3	0.101	1	10/12/2016 14:15	WG916127
Phorate	ND		0.101	1	10/12/2016 14:15	WG916127
Ronnel	ND		0.101	1	10/12/2016 14:15	WG916127
Stirophos	ND		0.101	1	10/12/2016 14:15	WG916127
Sulfotep	ND		0.101	1	10/12/2016 14:15	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 14:15	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 14:15	WG916127
Trichloronate	ND		0.101	1	10/12/2016 14:15	WG916127
(S) Triphenyl Phosphate	*91.8*		*40.0-120*		*10/12/2016 14:15*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0202	1	10/10/2016 12:03	WG915301
Alpha BHC	ND		0.0202	1	10/10/2016 12:03	WG915301
Beta BHC	ND		0.0202	1	10/10/2016 12:03	WG915301
Delta BHC	ND		0.0202	1	10/10/2016 12:03	WG915301
Gamma BHC	ND		0.0202	1	10/10/2016 12:03	WG915301
Chlordane	ND		0.202	1	10/10/2016 12:03	WG915301
4,4-DDD	ND		0.0202	1	10/10/2016 12:03	WG915301
4,4-DDE	ND		0.0202	1	10/10/2016 12:03	WG915301
4,4-DDT	ND		0.0202	1	10/10/2016 12:03	WG915301
Dieldrin	ND		0.0202	1	10/10/2016 12:03	WG915301
Endosulfan I	ND		0.0202	1	10/10/2016 12:03	WG915301
Endosulfan II	ND		0.0202	1	10/10/2016 12:03	WG915301
Endosulfan sulfate	ND		0.0202	1	10/10/2016 12:03	WG915301
Endrin	ND		0.0202	1	10/10/2016 12:03	WG915301
Endrin aldehyde	ND		0.0202	1	10/10/2016 12:03	WG915301
Endrin ketone	ND		0.0202	1	10/10/2016 12:03	WG915301
Hexachlorobenzene	ND		0.0202	1	10/10/2016 12:03	WG915301
Heptachlor	ND		0.0202	1	10/10/2016 12:03	WG915301
Heptachlor epoxide	ND		0.0202	1	10/10/2016 12:03	WG915301
Methoxychlor	ND		0.0202	1	10/10/2016 12:03	WG915301
Toxaphene	ND		0.405	1	10/10/2016 12:03	WG915301
(S) Decachlorobiphenyl	*84.0*		*10.0-143*		*10/10/2016 12:03*	WG915301
(S) Tetrachloro-m-xylene	*78.4*		*29.2-144*		*10/10/2016 12:03*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.2		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0202	1	10/07/2016 11:14	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.02	1	10/10/2016 11:19	WG915060
Arsenic	2.30		2.02	1	10/10/2016 11:19	WG915060
Barium	75.3		0.504	1	10/10/2016 11:19	WG915060
Beryllium	0.332		0.202	1	10/10/2016 11:19	WG915060
Cadmium	ND		0.504	1	10/10/2016 11:19	WG915060
Chromium	7.85		1.01	1	10/10/2016 11:19	WG915060
Cobalt	10.1		1.01	1	10/10/2016 11:19	WG915060
Copper	8.39		2.02	1	10/10/2016 11:19	WG915060
Lead	4.73		0.504	1	10/10/2016 11:19	WG915060
Molybdenum	ND		0.504	1	10/10/2016 11:19	WG915060
Nickel	10.1		2.02	1	10/10/2016 11:19	WG915060
Selenium	ND		2.02	1	10/10/2016 11:19	WG915060
Silver	ND		1.01	1	10/10/2016 11:19	WG915060
Thallium	ND		2.02	1	10/10/2016 11:19	WG915060
Vanadium	46.6		2.02	1	10/10/2016 11:19	WG915060
Zinc	58.8		5.04	1	10/12/2016 12:09	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0706	1	10/12/2016 02:01	WG915615
Dalapon	ND		0.0706	1	10/12/2016 02:01	WG915615
2,4-DB	ND	J4	0.0706	1	10/12/2016 02:01	WG915615
Dicamba	ND		0.0706	1	10/12/2016 02:01	WG915615
Dichloroprop	ND		0.0706	1	10/12/2016 02:01	WG915615
Dinoseb	ND		0.0706	1	10/12/2016 02:01	WG915615
MCPA	ND		6.55	1	10/12/2016 02:01	WG915615
MCPP	ND		6.55	1	10/12/2016 02:01	WG915615
2,4,5-T	ND		0.0706	1	10/12/2016 02:01	WG915615
2,4,5-TP (Silvex)	ND		0.0706	1	10/12/2016 02:01	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*109*		*15.0-122*		*10/12/2016 02:01*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 14:47	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 14:47	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 14:47	WG916127
Coumaphos	ND		0.101	1	10/12/2016 14:47	WG916127
Demeton,-O and -S	ND		0.0706	1	10/12/2016 14:47	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 14:47	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 14:47	WG916127
Dimethoate	ND		0.101	1	10/12/2016 14:47	WG916127
Disulfoton	ND		0.101	1	10/12/2016 14:47	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 14:47	WG916127
Ethoprop	ND		0.101	1	10/12/2016 14:47	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 14:47	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 14:47	WG916127
Fenthion	ND		0.101	1	10/12/2016 14:47	WG916127
Malathion	ND		0.101	1	10/12/2016 14:47	WG916127
Merphos	ND		0.101	1	10/12/2016 14:47	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 14:47	WG916127
Mevinphos	ND		0.101	1	10/12/2016 14:47	WG916127
Naled	ND	J3	0.101	1	10/12/2016 14:47	WG916127
Phorate	ND		0.101	1	10/12/2016 14:47	WG916127
Ronnel	ND		0.101	1	10/12/2016 14:47	WG916127
Stirophos	ND		0.101	1	10/12/2016 14:47	WG916127
Sulfotep	ND		0.101	1	10/12/2016 14:47	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 14:47	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 14:47	WG916127
Trichloronate	ND		0.101	1	10/12/2016 14:47	WG916127
(S) Triphenyl Phosphate	*86.2*		*40.0-120*		*10/12/2016 14:47*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0202	1	10/10/2016 12:43	WG915301
Alpha BHC	ND		0.0202	1	10/10/2016 12:43	WG915301
Beta BHC	ND		0.0202	1	10/10/2016 12:43	WG915301
Delta BHC	ND		0.0202	1	10/10/2016 12:43	WG915301
Gamma BHC	ND		0.0202	1	10/10/2016 12:43	WG915301
Chlordane	ND		0.202	1	10/10/2016 12:43	WG915301
4,4-DDD	ND		0.0202	1	10/10/2016 12:43	WG915301
4,4-DDE	ND		0.0202	1	10/10/2016 12:43	WG915301
4,4-DDT	ND		0.0202	1	10/10/2016 12:43	WG915301
Dieldrin	ND		0.0202	1	10/10/2016 12:43	WG915301
Endosulfan I	ND		0.0202	1	10/10/2016 12:43	WG915301
Endosulfan II	ND		0.0202	1	10/10/2016 12:43	WG915301
Endosulfan sulfate	ND		0.0202	1	10/10/2016 12:43	WG915301
Endrin	ND		0.0202	1	10/10/2016 12:43	WG915301
Endrin aldehyde	ND		0.0202	1	10/10/2016 12:43	WG915301
Endrin ketone	ND		0.0202	1	10/10/2016 12:43	WG915301
Hexachlorobenzene	ND		0.0202	1	10/10/2016 12:43	WG915301
Heptachlor	ND		0.0202	1	10/10/2016 12:43	WG915301
Heptachlor epoxide	ND		0.0202	1	10/10/2016 12:43	WG915301
Methoxychlor	ND		0.0202	1	10/10/2016 12:43	WG915301
Toxaphene	ND		0.403	1	10/10/2016 12:43	WG915301
(S) Decachlorobiphenyl	*84.9*		*10.0-143*		*10/10/2016 12:43*	WG915301
(S) Tetrachloro-m-xylene	*80.1*		*29.2-144*		*10/10/2016 12:43*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.0		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0202	1	10/07/2016 11:17	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.02	1	10/10/2016 11:21	WG915060
Arsenic	ND		2.02	1	10/10/2016 11:21	WG915060
Barium	72.2		0.505	1	10/10/2016 11:21	WG915060
Beryllium	0.297		0.202	1	10/10/2016 11:21	WG915060
Cadmium	ND		0.505	1	10/10/2016 11:21	WG915060
Chromium	7.17		1.01	1	10/10/2016 11:21	WG915060
Cobalt	8.79		1.01	1	10/10/2016 11:21	WG915060
Copper	8.95		2.02	1	10/10/2016 11:21	WG915060
Lead	5.52		0.505	1	10/10/2016 11:21	WG915060
Molybdenum	ND		0.505	1	10/10/2016 11:21	WG915060
Nickel	8.06		2.02	1	10/10/2016 11:21	WG915060
Selenium	ND		2.02	1	10/10/2016 11:21	WG915060
Silver	ND		1.01	1	10/10/2016 11:21	WG915060
Thallium	ND		2.02	1	10/10/2016 11:21	WG915060
Vanadium	31.7		2.02	1	10/10/2016 11:21	WG915060
Zinc	72.2		5.05	1	10/12/2016 12:18	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0707	1	10/12/2016 02:15	WG915615
Dalapon	ND		0.0707	1	10/12/2016 02:15	WG915615
2,4-DB	ND	J4	0.0707	1	10/12/2016 02:15	WG915615
Dicamba	ND		0.0707	1	10/12/2016 02:15	WG915615
Dichloroprop	ND		0.0707	1	10/12/2016 02:15	WG915615
Dinoseb	ND		0.0707	1	10/12/2016 02:15	WG915615
MCPA	ND		6.56	1	10/12/2016 02:15	WG915615
MCPP	ND		6.56	1	10/12/2016 02:15	WG915615
2,4,5-T	ND		0.0707	1	10/12/2016 02:15	WG915615
2,4,5-TP (Silvex)	ND		0.0707	1	10/12/2016 02:15	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*111*		*15.0-122*		*10/12/2016 02:15*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 15:19	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 15:19	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 15:19	WG916127
Coumaphos	ND		0.101	1	10/12/2016 15:19	WG916127
Demeton,-O and -S	ND		0.0707	1	10/12/2016 15:19	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 15:19	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 15:19	WG916127
Dimethoate	ND		0.101	1	10/12/2016 15:19	WG916127
Disulfoton	ND		0.101	1	10/12/2016 15:19	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 15:19	WG916127
Ethoprop	ND		0.101	1	10/12/2016 15:19	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 15:19	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 15:19	WG916127
Fenthion	ND		0.101	1	10/12/2016 15:19	WG916127
Malathion	ND		0.101	1	10/12/2016 15:19	WG916127
Merphos	ND		0.101	1	10/12/2016 15:19	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 15:19	WG916127
Mevinphos	ND		0.101	1	10/12/2016 15:19	WG916127
Naled	ND	J3	0.101	1	10/12/2016 15:19	WG916127
Phorate	ND		0.101	1	10/12/2016 15:19	WG916127
Ronnel	ND		0.101	1	10/12/2016 15:19	WG916127
Stirophos	ND		0.101	1	10/12/2016 15:19	WG916127
Sulfotep	ND		0.101	1	10/12/2016 15:19	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 15:19	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 15:19	WG916127
Trichloronate	ND		0.101	1	10/12/2016 15:19	WG916127
(S) Triphenyl Phosphate	*90.3*		*40.0-120*		*10/12/2016 15:19*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0202	1	10/10/2016 12:56	WG915301
Alpha BHC	ND		0.0202	1	10/10/2016 12:56	WG915301
Beta BHC	ND		0.0202	1	10/10/2016 12:56	WG915301
Delta BHC	ND		0.0202	1	10/10/2016 12:56	WG915301
Gamma BHC	ND		0.0202	1	10/10/2016 12:56	WG915301
Chlordane	ND		0.202	1	10/10/2016 12:56	WG915301
4,4-DDD	ND		0.0202	1	10/10/2016 12:56	WG915301
4,4-DDE	ND		0.0202	1	10/10/2016 12:56	WG915301
4,4-DDT	ND		0.0202	1	10/10/2016 12:56	WG915301
Dieldrin	ND		0.0202	1	10/10/2016 12:56	WG915301
Endosulfan I	ND		0.0202	1	10/10/2016 12:56	WG915301
Endosulfan II	ND		0.0202	1	10/10/2016 12:56	WG915301
Endosulfan sulfate	ND		0.0202	1	10/10/2016 12:56	WG915301
Endrin	ND		0.0202	1	10/10/2016 12:56	WG915301
Endrin aldehyde	ND		0.0202	1	10/10/2016 12:56	WG915301
Endrin ketone	ND		0.0202	1	10/10/2016 12:56	WG915301
Hexachlorobenzene	ND		0.0202	1	10/10/2016 12:56	WG915301
Heptachlor	ND		0.0202	1	10/10/2016 12:56	WG915301
Heptachlor epoxide	ND		0.0202	1	10/10/2016 12:56	WG915301
Methoxychlor	ND		0.0202	1	10/10/2016 12:56	WG915301
Toxaphene	ND		0.404	1	10/10/2016 12:56	WG915301
(S) Decachlorobiphenyl	*85.2*		*10.0-143*		*10/10/2016 12:56*	WG915301
(S) Tetrachloro-m-xylene	*76.8*		*29.2-144*		*10/10/2016 12:56*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.3		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0201	1	10/07/2016 11:20	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.01	1	10/10/2016 11:24	WG915060
Arsenic	2.80		2.01	1	10/10/2016 11:24	WG915060
Barium	81.4		0.504	1	10/10/2016 11:24	WG915060
Beryllium	0.334		0.201	1	10/10/2016 11:24	WG915060
Cadmium	ND		0.504	1	10/10/2016 11:24	WG915060
Chromium	8.39		1.01	1	10/10/2016 11:24	WG915060
Cobalt	11.0		1.01	1	10/10/2016 11:24	WG915060
Copper	8.50		2.01	1	10/10/2016 11:24	WG915060
Lead	5.18		0.504	1	10/10/2016 11:24	WG915060
Molybdenum	ND		0.504	1	10/10/2016 11:24	WG915060
Nickel	10.2		2.01	1	10/10/2016 11:24	WG915060
Selenium	ND		2.01	1	10/10/2016 11:24	WG915060
Silver	ND		1.01	1	10/10/2016 11:24	WG915060
Thallium	ND		2.01	1	10/10/2016 11:24	WG915060
Vanadium	52.0		2.01	1	10/10/2016 11:24	WG915060
Zinc	58.5		5.04	1	10/12/2016 12:21	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0705	1	10/12/2016 02:28	WG915615
Dalapon	ND		0.0705	1	10/12/2016 02:28	WG915615
2,4-DB	ND	J4	0.0705	1	10/12/2016 02:28	WG915615
Dicamba	ND		0.0705	1	10/12/2016 02:28	WG915615
Dichloroprop	ND		0.0705	1	10/12/2016 02:28	WG915615
Dinoseb	ND		0.0705	1	10/12/2016 02:28	WG915615
MCPA	ND		6.55	1	10/12/2016 02:28	WG915615
MCPP	ND		6.55	1	10/12/2016 02:28	WG915615
2,4,5-T	ND		0.0705	1	10/12/2016 02:28	WG915615
2,4,5-TP (Silvex)	ND		0.0705	1	10/12/2016 02:28	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*108*		*15.0-122*		*10/12/2016 02:28*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 15:50	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 15:50	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 15:50	WG916127
Coumaphos	ND		0.101	1	10/12/2016 15:50	WG916127
Demeton,-O and -S	ND		0.0705	1	10/12/2016 15:50	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 15:50	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 15:50	WG916127
Dimethoate	ND		0.101	1	10/12/2016 15:50	WG916127
Disulfoton	ND		0.101	1	10/12/2016 15:50	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 15:50	WG916127
Ethoprop	ND		0.101	1	10/12/2016 15:50	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 15:50	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 15:50	WG916127
Fenthion	ND		0.101	1	10/12/2016 15:50	WG916127
Malathion	ND		0.101	1	10/12/2016 15:50	WG916127
Merphos	ND		0.101	1	10/12/2016 15:50	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 15:50	WG916127
Mevinphos	ND		0.101	1	10/12/2016 15:50	WG916127
Naled	ND	J3	0.101	1	10/12/2016 15:50	WG916127
Phorate	ND		0.101	1	10/12/2016 15:50	WG916127
Ronnel	ND		0.101	1	10/12/2016 15:50	WG916127
Stirophos	ND		0.101	1	10/12/2016 15:50	WG916127
Sulfotep	ND		0.101	1	10/12/2016 15:50	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 15:50	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 15:50	WG916127
Trichloronate	ND		0.101	1	10/12/2016 15:50	WG916127
(S) Triphenyl Phosphate	*84.1*		*40.0-120*		*10/12/2016 15:50*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0201	1	10/10/2016 13:09	WG915301
Alpha BHC	ND		0.0201	1	10/10/2016 13:09	WG915301
Beta BHC	ND		0.0201	1	10/10/2016 13:09	WG915301
Delta BHC	ND		0.0201	1	10/10/2016 13:09	WG915301
Gamma BHC	ND		0.0201	1	10/10/2016 13:09	WG915301
Chlordane	ND		0.201	1	10/10/2016 13:09	WG915301
4,4-DDD	ND		0.0201	1	10/10/2016 13:09	WG915301
4,4-DDE	ND		0.0201	1	10/10/2016 13:09	WG915301
4,4-DDT	ND		0.0201	1	10/10/2016 13:09	WG915301
Dieldrin	ND		0.0201	1	10/10/2016 13:09	WG915301
Endosulfan I	ND		0.0201	1	10/10/2016 13:09	WG915301
Endosulfan II	ND		0.0201	1	10/10/2016 13:09	WG915301
Endosulfan sulfate	ND		0.0201	1	10/10/2016 13:09	WG915301
Endrin	ND		0.0201	1	10/10/2016 13:09	WG915301
Endrin aldehyde	ND		0.0201	1	10/10/2016 13:09	WG915301
Endrin ketone	ND		0.0201	1	10/10/2016 13:09	WG915301
Hexachlorobenzene	ND		0.0201	1	10/10/2016 13:09	WG915301
Heptachlor	ND		0.0201	1	10/10/2016 13:09	WG915301
Heptachlor epoxide	ND		0.0201	1	10/10/2016 13:09	WG915301
Methoxychlor	ND		0.0201	1	10/10/2016 13:09	WG915301
Toxaphene	ND		0.403	1	10/10/2016 13:09	WG915301
(S) Decachlorobiphenyl	*85.7*		*10.0-143*		*10/10/2016 13:09*	WG915301
(S) Tetrachloro-m-xylene	*80.5*		*29.2-144*		*10/10/2016 13:09*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.3		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0201	1	10/07/2016 11:23	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.01	1	10/10/2016 11:27	WG915060
Arsenic	2.84		2.01	1	10/10/2016 11:27	WG915060
Barium	71.6		0.503	1	10/10/2016 11:27	WG915060
Beryllium	0.368		0.201	1	10/10/2016 11:27	WG915060
Cadmium	ND		0.503	1	10/10/2016 11:27	WG915060
Chromium	10.6		1.01	1	10/10/2016 11:27	WG915060
Cobalt	11.9		1.01	1	10/10/2016 11:27	WG915060
Copper	10.4		2.01	1	10/10/2016 11:27	WG915060
Lead	5.15		0.503	1	10/10/2016 11:27	WG915060
Molybdenum	ND		0.503	1	10/10/2016 11:27	WG915060
Nickel	11.4		2.01	1	10/10/2016 11:27	WG915060
Selenium	ND		2.01	1	10/10/2016 11:27	WG915060
Silver	ND		1.01	1	10/10/2016 11:27	WG915060
Thallium	ND		2.01	1	10/10/2016 11:27	WG915060
Vanadium	60.8		2.01	1	10/10/2016 11:27	WG915060
Zinc	65.6		5.03	1	10/12/2016 12:24	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0705	1	10/12/2016 02:42	WG915615
Dalapon	ND		0.0705	1	10/12/2016 02:42	WG915615
2,4-DB	ND	J4	0.0705	1	10/12/2016 02:42	WG915615
Dicamba	ND		0.0705	1	10/12/2016 02:42	WG915615
Dichloroprop	ND		0.0705	1	10/12/2016 02:42	WG915615
Dinoseb	ND		0.0705	1	10/12/2016 02:42	WG915615
MCPA	ND		6.54	1	10/12/2016 02:42	WG915615
MCPP	ND		6.54	1	10/12/2016 02:42	WG915615
2,4,5-T	ND		0.0705	1	10/12/2016 02:42	WG915615
2,4,5-TP (Silvex)	ND		0.0705	1	10/12/2016 02:42	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*117*		*15.0-122*		*10/12/2016 02:42*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 16:22	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 16:22	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 16:22	WG916127
Coumaphos	ND		0.101	1	10/12/2016 16:22	WG916127
Demeton,-O and -S	ND		0.0705	1	10/12/2016 16:22	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 16:22	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 16:22	WG916127
Dimethoate	ND		0.101	1	10/12/2016 16:22	WG916127
Disulfoton	ND		0.101	1	10/12/2016 16:22	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 16:22	WG916127
Ethoprop	ND		0.101	1	10/12/2016 16:22	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 16:22	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 16:22	WG916127
Fenthion	ND		0.101	1	10/12/2016 16:22	WG916127
Malathion	ND		0.101	1	10/12/2016 16:22	WG916127
Merphos	ND		0.101	1	10/12/2016 16:22	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 16:22	WG916127
Mevinphos	ND		0.101	1	10/12/2016 16:22	WG916127
Naled	ND	J3	0.101	1	10/12/2016 16:22	WG916127
Phorate	ND		0.101	1	10/12/2016 16:22	WG916127
Ronnel	ND		0.101	1	10/12/2016 16:22	WG916127
Stirophos	ND		0.101	1	10/12/2016 16:22	WG916127
Sulfotep	ND		0.101	1	10/12/2016 16:22	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 16:22	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 16:22	WG916127
Trichloronate	ND		0.101	1	10/12/2016 16:22	WG916127
(S) Triphenyl Phosphate	*85.2*		*40.0-120*		*10/12/2016 16:22*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0201	1	10/10/2016 13:22	WG915301
Alpha BHC	ND		0.0201	1	10/10/2016 13:22	WG915301
Beta BHC	ND		0.0201	1	10/10/2016 13:22	WG915301
Delta BHC	ND		0.0201	1	10/10/2016 13:22	WG915301
Gamma BHC	ND		0.0201	1	10/10/2016 13:22	WG915301
Chlordane	ND		0.201	1	10/10/2016 13:22	WG915301
4,4-DDD	ND		0.0201	1	10/10/2016 13:22	WG915301
4,4-DDE	ND		0.0201	1	10/10/2016 13:22	WG915301
4,4-DDT	ND		0.0201	1	10/10/2016 13:22	WG915301
Dieldrin	ND		0.0201	1	10/10/2016 13:22	WG915301
Endosulfan I	ND		0.0201	1	10/10/2016 13:22	WG915301
Endosulfan II	ND		0.0201	1	10/10/2016 13:22	WG915301
Endosulfan sulfate	ND		0.0201	1	10/10/2016 13:22	WG915301
Endrin	ND		0.0201	1	10/10/2016 13:22	WG915301
Endrin aldehyde	ND		0.0201	1	10/10/2016 13:22	WG915301
Endrin ketone	ND		0.0201	1	10/10/2016 13:22	WG915301
Hexachlorobenzene	ND		0.0201	1	10/10/2016 13:22	WG915301
Heptachlor	ND		0.0201	1	10/10/2016 13:22	WG915301
Heptachlor epoxide	ND		0.0201	1	10/10/2016 13:22	WG915301
Methoxychlor	ND		0.0201	1	10/10/2016 13:22	WG915301
Toxaphene	ND		0.403	1	10/10/2016 13:22	WG915301
(S) Decachlorobiphenyl	*78.7*		*10.0-143*		*10/10/2016 13:22*	WG915301
(S) Tetrachloro-m-xylene	*71.5*		*29.2-144*		*10/10/2016 13:22*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.4		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0201	1	10/07/2016 11:26	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.01	1	10/10/2016 11:29	WG915060
Arsenic	2.24		2.01	1	10/10/2016 11:29	WG915060
Barium	85.4		0.503	1	10/10/2016 11:29	WG915060
Beryllium	0.396		0.201	1	10/10/2016 11:29	WG915060
Cadmium	ND		0.503	1	10/10/2016 11:29	WG915060
Chromium	11.5		1.01	1	10/10/2016 11:29	WG915060
Cobalt	12.3		1.01	1	10/10/2016 11:29	WG915060
Copper	9.10		2.01	1	10/10/2016 11:29	WG915060
Lead	5.86		0.503	1	10/10/2016 11:29	WG915060
Molybdenum	ND		0.503	1	10/10/2016 11:29	WG915060
Nickel	11.3		2.01	1	10/10/2016 11:29	WG915060
Selenium	ND		2.01	1	10/10/2016 11:29	WG915060
Silver	ND		1.01	1	10/10/2016 11:29	WG915060
Thallium	ND		2.01	1	10/10/2016 11:29	WG915060
Vanadium	60.2		2.01	1	10/10/2016 11:29	WG915060
Zinc	64.2		5.03	1	10/12/2016 12:27	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0704	1	10/12/2016 02:56	WG915615
Dalapon	ND		0.0704	1	10/12/2016 02:56	WG915615
2,4-DB	ND	J4	0.0704	1	10/12/2016 02:56	WG915615
Dicamba	ND		0.0704	1	10/12/2016 02:56	WG915615
Dichloroprop	ND		0.0704	1	10/12/2016 02:56	WG915615
Dinoseb	ND		0.0704	1	10/12/2016 02:56	WG915615
MCPA	ND		6.54	1	10/12/2016 02:56	WG915615
MCPP	ND		6.54	1	10/12/2016 02:56	WG915615
2,4,5-T	ND		0.0704	1	10/12/2016 02:56	WG915615
2,4,5-TP (Silvex)	ND		0.0704	1	10/12/2016 02:56	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*113*		*15.0-122*		*10/12/2016 02:56*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 16:53	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 16:53	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 16:53	WG916127
Coumaphos	ND		0.101	1	10/12/2016 16:53	WG916127
Demeton,-O and -S	ND		0.0704	1	10/12/2016 16:53	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 16:53	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 16:53	WG916127
Dimethoate	ND		0.101	1	10/12/2016 16:53	WG916127
Disulfoton	ND		0.101	1	10/12/2016 16:53	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 16:53	WG916127
Ethoprop	ND		0.101	1	10/12/2016 16:53	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 16:53	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 16:53	WG916127
Fenthion	ND		0.101	1	10/12/2016 16:53	WG916127
Malathion	ND		0.101	1	10/12/2016 16:53	WG916127
Merphos	ND		0.101	1	10/12/2016 16:53	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 16:53	WG916127
Mevinphos	ND		0.101	1	10/12/2016 16:53	WG916127
Naled	ND	J3	0.101	1	10/12/2016 16:53	WG916127
Phorate	ND		0.101	1	10/12/2016 16:53	WG916127
Ronnel	ND		0.101	1	10/12/2016 16:53	WG916127
Stirophos	ND		0.101	1	10/12/2016 16:53	WG916127
Sulfotep	ND		0.101	1	10/12/2016 16:53	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 16:53	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 16:53	WG916127
Trichloronate	ND		0.101	1	10/12/2016 16:53	WG916127
(S) Triphenyl Phosphate	*88.4*		*40.0-120*		*10/12/2016 16:53*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0201	1	10/10/2016 13:35	WG915301
Alpha BHC	ND		0.0201	1	10/10/2016 13:35	WG915301
Beta BHC	ND		0.0201	1	10/10/2016 13:35	WG915301
Delta BHC	ND		0.0201	1	10/10/2016 13:35	WG915301
Gamma BHC	ND		0.0201	1	10/10/2016 13:35	WG915301
Chlordane	ND		0.201	1	10/10/2016 13:35	WG915301
4,4-DDD	ND		0.0201	1	10/10/2016 13:35	WG915301
4,4-DDE	ND		0.0201	1	10/10/2016 13:35	WG915301
4,4-DDT	ND		0.0201	1	10/10/2016 13:35	WG915301
Dieldrin	ND		0.0201	1	10/10/2016 13:35	WG915301
Endosulfan I	ND		0.0201	1	10/10/2016 13:35	WG915301
Endosulfan II	ND		0.0201	1	10/10/2016 13:35	WG915301
Endosulfan sulfate	ND		0.0201	1	10/10/2016 13:35	WG915301
Endrin	ND		0.0201	1	10/10/2016 13:35	WG915301
Endrin aldehyde	ND		0.0201	1	10/10/2016 13:35	WG915301
Endrin ketone	ND		0.0201	1	10/10/2016 13:35	WG915301
Hexachlorobenzene	ND		0.0201	1	10/10/2016 13:35	WG915301
Heptachlor	ND		0.0201	1	10/10/2016 13:35	WG915301
Heptachlor epoxide	ND		0.0201	1	10/10/2016 13:35	WG915301
Methoxychlor	ND		0.0201	1	10/10/2016 13:35	WG915301
Toxaphene	ND		0.402	1	10/10/2016 13:35	WG915301
(S) Decachlorobiphenyl	*80.0*		*10.0-143*		*10/10/2016 13:35*	WG915301
(S) Tetrachloro-m-xylene	*74.6*		*29.2-144*		*10/10/2016 13:35*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.2		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0202	1	10/07/2016 11:29	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.02	1	10/10/2016 11:32	WG915060
Arsenic	2.45		2.02	1	10/10/2016 11:32	WG915060
Barium	86.3		0.504	1	10/10/2016 11:32	WG915060
Beryllium	0.384		0.202	1	10/10/2016 11:32	WG915060
Cadmium	ND		0.504	1	10/10/2016 11:32	WG915060
Chromium	10.5		1.01	1	10/10/2016 11:32	WG915060
Cobalt	12.3		1.01	1	10/10/2016 11:32	WG915060
Copper	9.79		2.02	1	10/10/2016 11:32	WG915060
Lead	5.06		0.504	1	10/10/2016 11:32	WG915060
Molybdenum	ND		0.504	1	10/10/2016 11:32	WG915060
Nickel	10.4		2.02	1	10/10/2016 11:32	WG915060
Selenium	ND		2.02	1	10/10/2016 11:32	WG915060
Silver	ND		1.01	1	10/10/2016 11:32	WG915060
Thallium	ND		2.02	1	10/10/2016 11:32	WG915060
Vanadium	63.0		2.02	1	10/10/2016 11:32	WG915060
Zinc	58.7		5.04	1	10/12/2016 12:30	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0706	1	10/12/2016 03:10	WG915615
Dalapon	ND		0.0706	1	10/12/2016 03:10	WG915615
2,4-DB	ND	J4	0.0706	1	10/12/2016 03:10	WG915615
Dicamba	ND		0.0706	1	10/12/2016 03:10	WG915615
Dichloroprop	ND		0.0706	1	10/12/2016 03:10	WG915615
Dinoseb	ND		0.0706	1	10/12/2016 03:10	WG915615
MCPA	ND		6.55	1	10/12/2016 03:10	WG915615
MCPP	ND		6.55	1	10/12/2016 03:10	WG915615
2,4,5-T	ND		0.0706	1	10/12/2016 03:10	WG915615
2,4,5-TP (Silvex)	ND		0.0706	1	10/12/2016 03:10	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*100*		*15.0-122*		*10/12/2016 03:10*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 17:25	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 17:25	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 17:25	WG916127
Coumaphos	ND		0.101	1	10/12/2016 17:25	WG916127
Demeton,-O and -S	ND		0.0706	1	10/12/2016 17:25	WG916127
Diazinon	ND	J6	0.101	1	10/12/2016 17:25	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 17:25	WG916127
Dimethoate	ND	J3	0.101	1	10/12/2016 17:25	WG916127
Disulfoton	ND		0.101	1	10/12/2016 17:25	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 17:25	WG916127
Ethoprop	ND		0.101	1	10/12/2016 17:25	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 17:25	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 17:25	WG916127
Fenthion	ND		0.101	1	10/12/2016 17:25	WG916127
Malathion	ND		0.101	1	10/12/2016 17:25	WG916127
Merphos	ND		0.101	1	10/12/2016 17:25	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 17:25	WG916127
Mevinphos	ND		0.101	1	10/12/2016 17:25	WG916127
Naled	ND		0.101	1	10/12/2016 17:25	WG916127
Phorate	ND		0.101	1	10/12/2016 17:25	WG916127
Ronnel	ND		0.101	1	10/12/2016 17:25	WG916127
Stirophos	ND		0.101	1	10/12/2016 17:25	WG916127
Sulfotep	ND		0.101	1	10/12/2016 17:25	WG916127
TEPP	ND	J6	1.01	1	10/12/2016 17:25	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 17:25	WG916127
Trichloronate	ND		0.101	1	10/12/2016 17:25	WG916127
(S) Triphenyl Phosphate	*84.9*		*40.0-120*		*10/12/2016 17:25*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0202	1	10/10/2016 13:48	WG915301
Alpha BHC	ND		0.0202	1	10/10/2016 13:48	WG915301
Beta BHC	ND		0.0202	1	10/10/2016 13:48	WG915301
Delta BHC	ND		0.0202	1	10/10/2016 13:48	WG915301
Gamma BHC	ND		0.0202	1	10/10/2016 13:48	WG915301
Chlordane	ND		0.202	1	10/10/2016 13:48	WG915301
4,4-DDD	ND		0.0202	1	10/10/2016 13:48	WG915301
4,4-DDE	ND		0.0202	1	10/10/2016 13:48	WG915301
4,4-DDT	ND		0.0202	1	10/10/2016 13:48	WG915301
Dieldrin	ND		0.0202	1	10/10/2016 13:48	WG915301
Endosulfan I	ND		0.0202	1	10/10/2016 13:48	WG915301
Endosulfan II	ND		0.0202	1	10/10/2016 13:48	WG915301
Endosulfan sulfate	ND		0.0202	1	10/10/2016 13:48	WG915301
Endrin	ND		0.0202	1	10/10/2016 13:48	WG915301
Endrin aldehyde	ND		0.0202	1	10/10/2016 13:48	WG915301
Endrin ketone	ND		0.0202	1	10/10/2016 13:48	WG915301
Hexachlorobenzene	ND		0.0202	1	10/10/2016 13:48	WG915301
Heptachlor	ND		0.0202	1	10/10/2016 13:48	WG915301
Heptachlor epoxide	ND		0.0202	1	10/10/2016 13:48	WG915301
Methoxychlor	ND		0.0202	1	10/10/2016 13:48	WG915301
Toxaphene	ND		0.403	1	10/10/2016 13:48	WG915301
(S) Decachlorobiphenyl	*86.4*		*10.0-143*		*10/10/2016 13:48*	WG915301
(S) Tetrachloro-m-xylene	*78.4*		*29.2-144*		*10/10/2016 13:48*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.1		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0202	1	10/07/2016 11:32	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.02	1	10/10/2016 11:34	WG915060
Arsenic	2.31		2.02	1	10/10/2016 11:34	WG915060
Barium	82.1		0.504	1	10/10/2016 11:34	WG915060
Beryllium	0.382		0.202	1	10/10/2016 11:34	WG915060
Cadmium	ND		0.504	1	10/10/2016 11:34	WG915060
Chromium	10.5		1.01	1	10/10/2016 11:34	WG915060
Cobalt	12.0		1.01	1	10/10/2016 11:34	WG915060
Copper	9.25		2.02	1	10/10/2016 11:34	WG915060
Lead	5.30		0.504	1	10/10/2016 11:34	WG915060
Molybdenum	ND		0.504	1	10/10/2016 11:34	WG915060
Nickel	10.4		2.02	1	10/10/2016 11:34	WG915060
Selenium	ND		2.02	1	10/10/2016 11:34	WG915060
Silver	ND		1.01	1	10/10/2016 11:34	WG915060
Thallium	ND		2.02	1	10/10/2016 11:34	WG915060
Vanadium	60.3		2.02	1	10/10/2016 11:34	WG915060
Zinc	60.4		5.04	1	10/12/2016 12:33	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0706	1	10/12/2016 03:24	WG915615
Dalapon	ND		0.0706	1	10/12/2016 03:24	WG915615
2,4-DB	ND	J4	0.0706	1	10/12/2016 03:24	WG915615
Dicamba	ND		0.0706	1	10/12/2016 03:24	WG915615
Dichloroprop	ND		0.0706	1	10/12/2016 03:24	WG915615
Dinoseb	ND		0.0706	1	10/12/2016 03:24	WG915615
MCPA	ND		6.56	1	10/12/2016 03:24	WG915615
MCPP	ND		6.56	1	10/12/2016 03:24	WG915615
2,4,5-T	ND		0.0706	1	10/12/2016 03:24	WG915615
2,4,5-TP (Silvex)	ND		0.0706	1	10/12/2016 03:24	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*104*		*15.0-122*		*10/12/2016 03:24*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 19:00	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 19:00	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 19:00	WG916127
Coumaphos	ND		0.101	1	10/12/2016 19:00	WG916127
Demeton,-O and -S	ND		0.0706	1	10/12/2016 19:00	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 19:00	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 19:00	WG916127
Dimethoate	ND		0.101	1	10/12/2016 19:00	WG916127
Disulfoton	ND		0.101	1	10/12/2016 19:00	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 19:00	WG916127
Ethoprop	ND		0.101	1	10/12/2016 19:00	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 19:00	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 19:00	WG916127
Fenthion	ND		0.101	1	10/12/2016 19:00	WG916127
Malathion	ND		0.101	1	10/12/2016 19:00	WG916127
Merphos	ND		0.101	1	10/12/2016 19:00	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 19:00	WG916127
Mevinphos	ND		0.101	1	10/12/2016 19:00	WG916127
Naled	ND	J3	0.101	1	10/12/2016 19:00	WG916127
Phorate	ND		0.101	1	10/12/2016 19:00	WG916127
Ronnel	ND		0.101	1	10/12/2016 19:00	WG916127
Stirophos	ND		0.101	1	10/12/2016 19:00	WG916127
Sulfotep	ND		0.101	1	10/12/2016 19:00	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 19:00	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 19:00	WG916127
Trichloronate	ND		0.101	1	10/12/2016 19:00	WG916127
(S) Triphenyl Phosphate	*92.9*		*40.0-120*		*10/12/2016 19:00*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0202	1	10/10/2016 14:02	WG915301
Alpha BHC	ND		0.0202	1	10/10/2016 14:02	WG915301
Beta BHC	ND		0.0202	1	10/10/2016 14:02	WG915301
Delta BHC	ND		0.0202	1	10/10/2016 14:02	WG915301
Gamma BHC	ND		0.0202	1	10/10/2016 14:02	WG915301
Chlordane	ND		0.202	1	10/10/2016 14:02	WG915301
4,4-DDD	ND		0.0202	1	10/10/2016 14:02	WG915301
4,4-DDE	ND		0.0202	1	10/10/2016 14:02	WG915301
4,4-DDT	ND		0.0202	1	10/10/2016 14:02	WG915301
Dieldrin	ND		0.0202	1	10/10/2016 14:02	WG915301
Endosulfan I	ND		0.0202	1	10/10/2016 14:02	WG915301
Endosulfan II	ND		0.0202	1	10/10/2016 14:02	WG915301
Endosulfan sulfate	ND		0.0202	1	10/10/2016 14:02	WG915301
Endrin	ND		0.0202	1	10/10/2016 14:02	WG915301
Endrin aldehyde	ND		0.0202	1	10/10/2016 14:02	WG915301
Endrin ketone	ND		0.0202	1	10/10/2016 14:02	WG915301
Hexachlorobenzene	ND		0.0202	1	10/10/2016 14:02	WG915301
Heptachlor	ND		0.0202	1	10/10/2016 14:02	WG915301
Heptachlor epoxide	ND		0.0202	1	10/10/2016 14:02	WG915301
Methoxychlor	ND		0.0202	1	10/10/2016 14:02	WG915301
Toxaphene	ND		0.403	1	10/10/2016 14:02	WG915301
(S) Decachlorobiphenyl	*86.2*		*10.0-143*		*10/10/2016 14:02*	WG915301
(S) Tetrachloro-m-xylene	*81.5*		*29.2-144*		*10/10/2016 14:02*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.1		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0202	1	10/07/2016 11:35	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.02	1	10/10/2016 11:37	WG915060
Arsenic	2.79		2.02	1	10/10/2016 11:37	WG915060
Barium	82.7		0.505	1	10/10/2016 11:37	WG915060
Beryllium	0.389		0.202	1	10/10/2016 11:37	WG915060
Cadmium	ND		0.505	1	10/10/2016 11:37	WG915060
Chromium	11.9		1.01	1	10/10/2016 11:37	WG915060
Cobalt	12.1		1.01	1	10/10/2016 11:37	WG915060
Copper	7.99		2.02	1	10/10/2016 11:37	WG915060
Lead	5.53		0.505	1	10/10/2016 11:37	WG915060
Molybdenum	ND		0.505	1	10/10/2016 11:37	WG915060
Nickel	11.2		2.02	1	10/10/2016 11:37	WG915060
Selenium	ND		2.02	1	10/10/2016 11:37	WG915060
Silver	ND		1.01	1	10/10/2016 11:37	WG915060
Thallium	ND		2.02	1	10/10/2016 11:37	WG915060
Vanadium	59.8		2.02	1	10/10/2016 11:37	WG915060
Zinc	61.0		5.05	1	10/12/2016 12:36	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0707	1	10/12/2016 03:37	WG915615
Dalapon	ND		0.0707	1	10/12/2016 03:37	WG915615
2,4-DB	ND	J4	0.0707	1	10/12/2016 03:37	WG915615
Dicamba	ND		0.0707	1	10/12/2016 03:37	WG915615
Dichloroprop	ND		0.0707	1	10/12/2016 03:37	WG915615
Dinoseb	ND		0.0707	1	10/12/2016 03:37	WG915615
MCPA	ND		6.56	1	10/12/2016 03:37	WG915615
MCPP	ND		6.56	1	10/12/2016 03:37	WG915615
2,4,5-T	ND		0.0707	1	10/12/2016 03:37	WG915615
2,4,5-TP (Silvex)	ND		0.0707	1	10/12/2016 03:37	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*102*		*15.0-122*		*10/12/2016 03:37*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 19:31	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 19:31	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 19:31	WG916127
Coumaphos	ND		0.101	1	10/12/2016 19:31	WG916127
Demeton,-O and -S	ND		0.0707	1	10/12/2016 19:31	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 19:31	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 19:31	WG916127
Dimethoate	ND		0.101	1	10/12/2016 19:31	WG916127
Disulfoton	ND		0.101	1	10/12/2016 19:31	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 19:31	WG916127
Ethoprop	ND		0.101	1	10/12/2016 19:31	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 19:31	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 19:31	WG916127
Fenthion	ND		0.101	1	10/12/2016 19:31	WG916127
Malathion	ND		0.101	1	10/12/2016 19:31	WG916127
Merphos	ND		0.101	1	10/12/2016 19:31	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 19:31	WG916127
Mevinphos	ND		0.101	1	10/12/2016 19:31	WG916127
Naled	ND	J3	0.101	1	10/12/2016 19:31	WG916127
Phorate	ND		0.101	1	10/12/2016 19:31	WG916127
Ronnel	ND		0.101	1	10/12/2016 19:31	WG916127
Stirophos	ND		0.101	1	10/12/2016 19:31	WG916127
Sulfotep	ND		0.101	1	10/12/2016 19:31	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 19:31	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 19:31	WG916127
Trichloronate	ND		0.101	1	10/12/2016 19:31	WG916127
(S) Triphenyl Phosphate	*88.6*		*40.0-120*		*10/12/2016 19:31*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0202	1	10/10/2016 14:15	WG915301
Alpha BHC	ND		0.0202	1	10/10/2016 14:15	WG915301
Beta BHC	ND		0.0202	1	10/10/2016 14:15	WG915301
Delta BHC	ND		0.0202	1	10/10/2016 14:15	WG915301
Gamma BHC	ND		0.0202	1	10/10/2016 14:15	WG915301
Chlordane	ND		0.202	1	10/10/2016 14:15	WG915301
4,4-DDD	ND		0.0202	1	10/10/2016 14:15	WG915301
4,4-DDE	ND		0.0202	1	10/10/2016 14:15	WG915301
4,4-DDT	ND		0.0202	1	10/10/2016 14:15	WG915301
Dieldrin	ND		0.0202	1	10/10/2016 14:15	WG915301
Endosulfan I	ND		0.0202	1	10/10/2016 14:15	WG915301
Endosulfan II	ND		0.0202	1	10/10/2016 14:15	WG915301
Endosulfan sulfate	ND		0.0202	1	10/10/2016 14:15	WG915301
Endrin	ND		0.0202	1	10/10/2016 14:15	WG915301
Endrin aldehyde	ND		0.0202	1	10/10/2016 14:15	WG915301
Endrin ketone	ND		0.0202	1	10/10/2016 14:15	WG915301
Hexachlorobenzene	ND		0.0202	1	10/10/2016 14:15	WG915301
Heptachlor	ND		0.0202	1	10/10/2016 14:15	WG915301
Heptachlor epoxide	ND		0.0202	1	10/10/2016 14:15	WG915301
Methoxychlor	ND		0.0202	1	10/10/2016 14:15	WG915301
Toxaphene	ND		0.404	1	10/10/2016 14:15	WG915301
(S) Decachlorobiphenyl	*79.9*		*10.0-143*		*10/10/2016 14:15*	WG915301
(S) Tetrachloro-m-xylene	*74.7*		*29.2-144*		*10/10/2016 14:15*	WG915301

Total Solids by Method 2540 G-2011

Analyte	Result	Qualifier	Dilution	Analysis	Batch
	%			date / time	
Total Solids	99.4		1	10/07/2016 10:02	WG914939

Mercury by Method 7471A

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Mercury	ND		0.0201	1	10/07/2016 11:38	WG914418

Metals (ICP) by Method 6010C

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Antimony	ND		2.01	1	10/10/2016 11:40	WG915060
Arsenic	2.63		2.01	1	10/10/2016 11:40	WG915060
Barium	72.5		0.503	1	10/10/2016 11:40	WG915060
Beryllium	0.352		0.201	1	10/10/2016 11:40	WG915060
Cadmium	ND		0.503	1	10/10/2016 11:40	WG915060
Chromium	9.80		1.01	1	10/10/2016 11:40	WG915060
Cobalt	11.4		1.01	1	10/10/2016 11:40	WG915060
Copper	8.87		2.01	1	10/10/2016 11:40	WG915060
Lead	5.20		0.503	1	10/10/2016 11:40	WG915060
Molybdenum	ND		0.503	1	10/10/2016 11:40	WG915060
Nickel	10.6		2.01	1	10/10/2016 11:40	WG915060
Selenium	ND		2.01	1	10/10/2016 11:40	WG915060
Silver	ND		1.01	1	10/10/2016 11:40	WG915060
Thallium	ND		2.01	1	10/10/2016 11:40	WG915060
Vanadium	55.9		2.01	1	10/10/2016 11:40	WG915060
Zinc	54.1		5.03	1	10/12/2016 12:39	WG916216

Chlorinated Acid Herbicides (GC) by Method 8151

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
2,4-D	ND		0.0704	1	10/12/2016 03:51	WG915615
Dalapon	ND		0.0704	1	10/12/2016 03:51	WG915615
2,4-DB	ND	J4	0.0704	1	10/12/2016 03:51	WG915615
Dicamba	ND		0.0704	1	10/12/2016 03:51	WG915615
Dichloroprop	ND		0.0704	1	10/12/2016 03:51	WG915615
Dinoseb	ND		0.0704	1	10/12/2016 03:51	WG915615
MCPA	ND		6.54	1	10/12/2016 03:51	WG915615
MCPP	ND		6.54	1	10/12/2016 03:51	WG915615
2,4,5-T	ND		0.0704	1	10/12/2016 03:51	WG915615
2,4,5-TP (Silvex)	ND		0.0704	1	10/12/2016 03:51	WG915615
(S) 2,4-Dichlorophenyl Acetic Acid	*105*		*15.0-122*		*10/12/2016 03:51*	WG915615

OP Pesticides by Method 8141

Analyte	Result (dry)	Qualifier	RDL (dry)	Dilution	Analysis	Batch
	mg/kg		mg/kg		date / time	
Azinphos-Methyl	ND		0.101	1	10/12/2016 20:03	WG916127
Bolstar (Sulprofos)	ND		0.101	1	10/12/2016 20:03	WG916127
Chlorpyrifos	ND		0.101	1	10/12/2016 20:03	WG916127
Coumaphos	ND		0.101	1	10/12/2016 20:03	WG916127
Demeton,-O and -S	ND		0.0704	1	10/12/2016 20:03	WG916127
Diazinon	ND	J3	0.101	1	10/12/2016 20:03	WG916127
Dichlorvos	ND		0.101	1	10/12/2016 20:03	WG916127
Dimethoate	ND		0.101	1	10/12/2016 20:03	WG916127
Disulfoton	ND		0.101	1	10/12/2016 20:03	WG916127

OP Pesticides by Method 8141

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
EPN	ND		0.101	1	10/12/2016 20:03	WG916127
Ethoprop	ND		0.101	1	10/12/2016 20:03	WG916127
Ethyl Parathion	ND		0.101	1	10/12/2016 20:03	WG916127
Fensulfothion	ND	J3	0.101	1	10/12/2016 20:03	WG916127
Fenthion	ND		0.101	1	10/12/2016 20:03	WG916127
Malathion	ND		0.101	1	10/12/2016 20:03	WG916127
Merphos	ND		0.101	1	10/12/2016 20:03	WG916127
Methyl parathion	ND		0.101	1	10/12/2016 20:03	WG916127
Mevinphos	ND		0.101	1	10/12/2016 20:03	WG916127
Naled	ND	J3	0.101	1	10/12/2016 20:03	WG916127
Phorate	ND		0.101	1	10/12/2016 20:03	WG916127
Ronnel	ND		0.101	1	10/12/2016 20:03	WG916127
Stirophos	ND		0.101	1	10/12/2016 20:03	WG916127
Sulfotep	ND		0.101	1	10/12/2016 20:03	WG916127
TEPP	ND	J3	1.01	1	10/12/2016 20:03	WG916127
Tokuthion (Prothothiofos)	ND		0.101	1	10/12/2016 20:03	WG916127
Trichloronate	ND		0.101	1	10/12/2016 20:03	WG916127
(S) Triphenyl Phosphate	*92.6*		*40.0-120*		*10/12/2016 20:03*	WG916127

Pesticides (GC) by Method 8081

Analyte	Result (dry) mg/kg	Qualifier	RDL (dry) mg/kg	Dilution	Analysis date / time	Batch
Aldrin	ND		0.0201	1	10/10/2016 14:28	WG915301
Alpha BHC	ND		0.0201	1	10/10/2016 14:28	WG915301
Beta BHC	ND		0.0201	1	10/10/2016 14:28	WG915301
Delta BHC	ND		0.0201	1	10/10/2016 14:28	WG915301
Gamma BHC	ND		0.0201	1	10/10/2016 14:28	WG915301
Chlordane	ND		0.201	1	10/10/2016 14:28	WG915301
4,4-DDD	ND		0.0201	1	10/10/2016 14:28	WG915301
4,4-DDE	ND		0.0201	1	10/10/2016 14:28	WG915301
4,4-DDT	ND		0.0201	1	10/10/2016 14:28	WG915301
Dieldrin	ND		0.0201	1	10/10/2016 14:28	WG915301
Endosulfan I	ND		0.0201	1	10/10/2016 14:28	WG915301
Endosulfan II	ND		0.0201	1	10/10/2016 14:28	WG915301
Endosulfan sulfate	ND		0.0201	1	10/10/2016 14:28	WG915301
Endrin	ND		0.0201	1	10/10/2016 14:28	WG915301
Endrin aldehyde	ND		0.0201	1	10/10/2016 14:28	WG915301
Endrin ketone	ND		0.0201	1	10/10/2016 14:28	WG915301
Hexachlorobenzene	ND		0.0201	1	10/10/2016 14:28	WG915301
Heptachlor	ND		0.0201	1	10/10/2016 14:28	WG915301
Heptachlor epoxide	ND		0.0201	1	10/10/2016 14:28	WG915301
Methoxychlor	ND		0.0201	1	10/10/2016 14:28	WG915301
Toxaphene	ND		0.403	1	10/10/2016 14:28	WG915301
(S) Decachlorobiphenyl	*84.9*		*10.0-143*		*10/10/2016 14:28*	WG915301
(S) Tetrachloro-m-xylene	*81.2*		*29.2-144*		*10/10/2016 14:28*	WG915301

Method Blank (MB)

(MB) R3169075-1 10/07/16 10:02

Analyte	MB Result %	MB Qualifier	MB MDL %	MB RDL %
Total Solids	0.000400			

L864107-01 Original Sample (OS) • Duplicate (DUP)

(OS) L864107-01 10/07/16 10:02 • (DUP) R3169075-3 10/07/16 10:02

Analyte	Original Result %	DUP Result %	Dilution	DUP RPD %	DUP Qualifier	DUP RPD Limits %
Total Solids	98.8	98.7	1	0.0582		5

Laboratory Control Sample (LCS)

(LCS) R3169075-2 10/07/16 10:02

Analyte	Spike Amount %	LCS Result %	LCS Rec. %	Rec. Limits %	LCS Qualifier
Total Solids	50.0	50.0	100	85.0-115	

Method Blank (MB)

(MB) R3168958-1 10/07/16 10:36

Analyte	MB Result	MB Qualifier	MB MDL	MB RDL
	mg/kg		mg/kg	mg/kg
Mercury	U		0.0028	0.0200

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3168958-2 10/07/16 10:39 • (LCSD) R3168958-3 10/07/16 10:42

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	LCS Qualifier	LCSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	%	%	%			%	%
Mercury	0.300	0.248	0.283	83	94	80-120			13	20

L864107-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L864107-01 10/07/16 10:45 • (MS) R3168958-4 10/07/16 10:48 • (MSD) R3168958-5 10/07/16 10:51

Analyte	Spike Amount (dry)	Original Result (dry)	MS Result (dry)	MSD Result (dry)	MS Rec.	MSD Rec.	Dilution	Rec. Limits	MS Qualifier	MSD Qualifier	RPD	RPD Limits
	mg/kg	mg/kg	mg/kg	mg/kg	%	%		%			%	%
Mercury	0.304	ND	0.268	0.262	88	86	1	75-125			2	20

Method Blank (MB)

(MB) R3169375-1 10/10/16 10:29

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Antimony	U		0.75	2.00
Arsenic	U		0.65	2.00
Barium	U		0.17	0.500
Beryllium	U		0.07	0.200
Cadmium	U		0.07	0.500
Chromium	U		0.14	1.00
Cobalt	U		0.23	1.00
Copper	U		0.53	2.00
Lead	U		0.19	0.500
Molybdenum	U		0.16	0.500
Nickel	0.695	J	0.49	2.00
Selenium	U		0.74	2.00
Silver	U		0.28	1.00
Thallium	U		0.65	2.00
Vanadium	U		0.24	2.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3169375-2 10/10/16 10:32 • (LCSD) R3169375-3 10/10/16 10:34

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Antimony	100	88.2	93.6	88	94	80-120			6	20
Arsenic	100	93.9	99.5	94	99	80-120			6	20
Barium	100	90.7	96.0	91	96	80-120			6	20
Beryllium	100	94.7	99.4	95	99	80-120			5	20
Cadmium	100	94.0	99.9	94	100	80-120			6	20
Chromium	100	90.6	96.4	91	96	80-120			6	20
Cobalt	100	91.2	97.0	91	97	80-120			6	20
Copper	100	94.2	100	94	100	80-120			6	20
Lead	100	88.6	94.6	89	95	80-120			7	20
Molybdenum	100	97.9	104	98	104	80-120			6	20
Nickel	100	93.2	99.3	93	99	80-120			6	20
Selenium	100	97.3	103	97	103	80-120			6	20
Silver	100	91.4	97.4	91	97	80-120			6	20
Thallium	100	84.4	89.7	84	90	80-120			6	20
Vanadium	100	92.1	97.0	92	97	80-120			5	20

L864001-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L864001-01 10/10/16 10:37 • (MS) R3169375-6 10/10/16 10:50 • (MSD) R3169375-7 10/10/16 10:52

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Antimony	107	U	55.6	60.4	52	57	1	75-125	J6	J6	8	20
Arsenic	107	U	95.7	102	90	96	1	75-125			6	20
Barium	107	115	236	239	113	116	1	75-125			1	20
Beryllium	107	1.18	97.4	103	90	96	1	75-125			6	20
Cadmium	107	U	98.3	104	92	98	1	75-125			6	20
Chromium	107	29.1	132	137	97	101	1	75-125			4	20
Cobalt	107	17.5	127	130	102	106	1	75-125			3	20
Copper	107	1.19	102	108	94	100	1	75-125			6	20
Lead	107	11.9	114	119	96	100	1	75-125			4	20
Molybdenum	107	U	93.2	99	88	93	1	75-125			6	20
Nickel	107	28.1	143	148	107	112	1	75-125			4	20
Selenium	107	U	100	106	94	100	1	75-125			6	20
Silver	107	U	98.3	105	92	98	1	75-125			6	20
Thallium	107	U	91.9	96.7	86	91	1	75-125			5	20
Vanadium	107	40.3	141	148	95	101	1	75-125			5	20

Method Blank (MB)

(MB) R3170022-1 10/12/16 11:44

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Zinc	0.971	J	0.59	5.00

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3170022-2 10/12/16 11:46 • (LCSD) R3170022-3 10/12/16 11:48

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Zinc	100	102	103	102	103	80-120			1	20

L864844-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L864844-01 10/12/16 11:51 • (MS) R3170022-6 10/12/16 12:00 • (MSD) R3170022-7 10/12/16 12:03

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Zinc	140	29.5	160	165	94	97	1	75-125			3	20

Method Blank (MB)

(MB) R3170140-1 10/12/16 00:38

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
2,4-D	U		0.0110	0.0700
Dalapon	U		0.0110	0.0700
2,4-DB	U		0.0110	0.0700
Dicamba	U		0.0110	0.0700
Dichloroprop	U		0.0110	0.0700
Dinoseb	U		0.0110	0.0700
MCPA	U		1.22	6.50
MCPP	U		1.22	6.50
2,4,5-T	U		0.0110	0.0700
2,4,5-TP (Silvex)	U		0.0110	0.0700
(S) 2,4-Dichlorophenyl Acetic Acid	*110*			*15.0-122*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3170140-2 10/12/16 00:52 • (LCSD) R3170140-3 10/12/16 01:05

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
2,4-D	0.167	0.181	0.199	109	119	22.0-120			9.28	40
Dalapon	0.167	0.146	0.151	87.3	90.5	25.0-120			3.56	40
2,4-DB	0.167	0.218	0.239	131	143	26.0-120	J4	J4	8.99	40
Dicamba	0.167	0.140	0.166	83.8	99.5	34.0-121			17.1	39
Dichloroprop	0.167	0.161	0.179	96.4	107	17.0-120			10.8	40
Dinoseb	0.167	0.126	0.140	75.9	83.9	10.0-120			10.0	40
MCPA	16.7	14.8	16.6	88.6	99.9	17.0-120			12.0	40
MCPP	16.7	17.0	19.3	102	116	19.0-124			12.4	40
2,4,5-T	0.167	0.170	0.180	102	108	29.0-120			6.04	40
2,4,5-TP (Silvex)	0.167	0.150	0.157	89.7	94.4	31.0-120			5.17	40
(S) 2,4-Dichlorophenyl Acetic Acid				*101*	*109*	*15.0-122*				

L864107-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L864107-01 10/12/16 01:19 • (MS) R3170140-4 10/12/16 01:33 • (MSD) R3170140-5 10/12/16 01:47

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
2,4-D	0.169	ND	0.400	0.438	237	259	1	10.0-138	E J5	E J5	9.03	35
Dalapon	0.169	ND	0.181	0.169	107	100	1	12.0-120			6.92	36
2,4-DB	0.169	ND	0.440	0.404	261	239	1	10.0-146	E J5	E J5	8.61	40

L864107-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L864107-01 10/12/16 01:19 • (MS) R3170140-4 10/12/16 01:33 • (MSD) R3170140-5 10/12/16 01:47

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Dicamba	0.169	ND	0.137	0.119	81.4	70.7	1	16.0-135			14.0	36
Dichloroprop	0.169	ND	0.152	0.136	89.9	80.8	1	10.0-120			10.7	34
Dinoseb	0.169	ND	0.138	0.126	81.9	74.6	1	10.0-122			9.25	40
MCPA	16.9	ND	21.7	21.0	129	125	1	10.0-134			3.34	40
MCPP	16.9	ND	38.6	34.1	229	202	1	10.0-140	E J5	E J5	12.3	40
2,4,5-T	0.169	ND	0.178	0.169	105	99.9	1	17.0-120			5.39	32
2,4,5-TP (Silvex)	0.169	ND	0.153	0.144	91.0	85.6	1	15.0-120			6.13	35
(S) 2,4-Dichlorophenyl Acetic Acid					*121*	*110*		*15.0-122*				

Method Blank (MB)

(MB) R3170299-1 10/12/16 12:41

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Azinphos-Methyl	U		0.00378	0.100
Bolstar (Sulprofos)	U		0.00554	0.100
Chlorpyrifos	U		0.00923	0.100
Coumaphos	U		0.00680	0.100
Demeton,-O and -S	U		0.00339	0.0700
Diazinon	U		0.00447	0.100
Dichlorvos	U		0.00969	0.100
Dimethoate	U		0.0198	0.100
Disulfoton	U		0.00498	0.100
EPN	U		0.00512	0.100
Ethoprop	U		0.00465	0.100
Ethyl Parathion	U		0.00571	0.100
Fensulfothion	U		0.0169	0.100
Fenthion	U		0.00608	0.100
Malathion	U		0.00700	0.100
Merphos	U		0.00539	0.100
Methyl parathion	U		0.00669	0.100
Mevinphos	U		0.0102	0.100
Naled	U		0.00418	0.100
Phorate	U		0.00471	0.100
Ronnel	U		0.00437	0.100
Stirophos	U		0.00537	0.100
Sulfotep	U		0.00386	0.100
TEPP	U		0.157	1.00
Tokuthion (Prothothiofos)	U		0.00604	0.100
Trichloronate	U		0.00664	0.100
(S) Triphenyl Phosphate	*86.4*			*40.0-120*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3170299-2 10/12/16 13:12 • (LCSD) R3170299-3 10/12/16 13:44

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Azinphos-Methyl	0.334	0.389	0.325	117	97.6	54.0-124			17.8	20
Bolstar (Sulprofos)	0.334	0.368	0.316	110	94.9	65.0-120			15.0	20
Chlorpyrifos	0.334	0.363	0.321	109	96.2	69.0-120			12.3	20
Coumaphos	0.334	0.341	0.284	102	85.2	58.0-122			18.3	20
Demeton,-O and -S	0.167	0.194	0.160	117	95.9	61.0-120			19.5	20
Diazinon	0.334	0.354	0.285	106	85.3	58.0-120		J3	21.8	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3170299-2 10/12/16 13:12 • (LCSD) R3170299-3 10/12/16 13:44

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Dichlorvos	0.334	0.336	0.284	101	85.3	37.0-120			16.6	20
Dimethoate	0.334	0.388	0.318	116	95.2	48.0-120			20.0	20
Disulfoton	0.334	0.378	0.322	113	96.5	67.0-120			15.9	20
EPN	0.334	0.334	0.281	100	84.1	50.0-122			17.2	20
Ethoprop	0.334	0.358	0.316	107	94.6	68.0-120			12.6	20
Ethyl Parathion	0.334	0.329	0.277	98.7	83.1	63.0-120			17.2	20
Fensulfothion	0.334	0.401	0.321	120	96.3	43.0-121		J3	22.1	21
Fenthion	0.334	0.393	0.339	118	102	64.0-120			14.7	20
Malathion	0.334	0.348	0.294	104	88.1	67.0-120			16.8	20
Merphos	0.334	0.336	0.295	101	88.5	60.0-120			12.9	20
Methyl parathion	0.334	0.357	0.302	107	90.5	63.0-120			16.8	20
Mevinphos	0.334	0.358	0.299	107	89.8	49.0-120			17.9	20
Naled	0.334	0.333	0.247	99.9	74.1	10.0-129		J3	29.7	26
Phorate	0.334	0.341	0.306	102	91.6	65.0-120			11.0	20
Ronnel	0.334	0.369	0.328	111	98.4	67.0-120			11.9	20
Stirophos	0.334	0.376	0.316	113	94.9	63.0-120			17.1	20
Sulfotep	0.334	0.355	0.310	106	93.1	70.0-120			13.4	20
TEPP	3.34	3.90	1.60	117	47.9	1.00-120		J3	83.8	40
Tokuthion (Prothothiofos)	0.334	0.369	0.321	111	96.2	67.0-120			14.0	20
Trichloronate	0.334	0.367	0.331	110	99.1	68.0-120			10.4	20
(S) Triphenyl Phosphate				*108*	*90.6*	*40.0-120*				

L864107-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L864107-07 10/12/16 17:25 • (MS) R3170299-4 10/12/16 17:57 • (MSD) R3170299-5 10/12/16 18:28

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Azinphos-Methyl	0.336	ND	0.297	0.272	88.3	81.0	1	50.0-124			8.55	20
Bolstar (Sulprofos)	0.336	ND	0.309	0.269	91.8	80.0	1	56.0-120			13.7	20
Chlorpyrifos	0.336	ND	0.306	0.272	91.0	80.8	1	61.0-120			11.8	20
Coumaphos	0.336	ND	0.262	0.223	77.8	66.2	1	44.0-128			16.1	20
Demeton,-O and -S	0.168	ND	0.138	0.126	82.1	75.1	1	53.0-120			8.92	20
Diazinon	0.336	ND	0.176	0.155	52.3	46.1	1	61.0-120	J6	J6	12.6	20
Dichlorvos	0.336	ND	0.310	0.276	92.2	82.0	1	43.0-145			11.7	23
Dimethoate	0.336	ND	0.156	0.208	46.4	61.8	1	42.0-120		J3	28.4	26
Disulfoton	0.336	ND	0.311	0.271	92.4	80.6	1	56.0-120			13.5	20
EPN	0.336	ND	0.295	0.256	87.6	76.2	1	43.0-120			14.0	20
Ethoprop	0.336	ND	0.301	0.263	89.6	78.3	1	62.0-120			13.5	20
Ethyl Parathion	0.336	ND	0.287	0.246	85.3	73.2	1	58.0-120			15.3	20

L864107-07 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L864107-07 10/12/16 17:25 • (MS) R3170299-4 10/12/16 17:57 • (MSD) R3170299-5 10/12/16 18:28

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Fensulfothion	0.336	ND	0.175	0.221	52.1	65.6	1	40.0-120		J3	23.1	23
Fenthion	0.336	ND	0.315	0.278	93.7	82.8	1	56.0-120			12.4	20
Malathion	0.336	ND	0.282	0.240	84.0	71.3	1	61.0-120			16.4	20
Merphos	0.336	ND	0.247	0.213	73.6	63.3	1	45.0-120			15.0	23
Methyl parathion	0.336	ND	0.308	0.267	91.6	79.4	1	59.0-120			14.3	20
Mevinphos	0.336	ND	0.186	0.188	55.3	55.9	1	48.0-120			1.17	20
Naled	0.336	ND	0.136	0.0992	40.4	29.5	1	10.0-127			31.3	40
Phorate	0.336	ND	0.309	0.273	92.0	81.3	1	62.0-120			12.4	20
Ronnel	0.336	ND	0.310	0.277	92.1	82.3	1	60.0-120			11.2	20
Stirophos	0.336	ND	0.303	0.263	90.2	78.2	1	54.0-120			14.3	20
Sulfotep	0.336	ND	0.301	0.257	89.4	76.3	1	64.0-120			15.8	20
TEPP	3.36	ND	ND	ND	0.000	0.000	1	1.00-144	J6	J6	0.000	39
Tokuthion (Prothothiofos)	0.336	ND	0.313	0.278	93.2	82.7	1	59.0-120			12.0	20
Trichloronate	0.336	ND	0.317	0.286	94.3	85.0	1	60.0-120			10.3	20
(S) Triphenyl Phosphate					*85.3*	*74.3*		*40.0-120*				

Method Blank (MB)

(MB) R3169394-3 10/10/16 11:24

Analyte	MB Result mg/kg	MB Qualifier	MB MDL mg/kg	MB RDL mg/kg
Aldrin	U		0.00135	0.0200
Alpha BHC	U		0.00136	0.0200
Beta BHC	U		0.00160	0.0200
Delta BHC	U		0.00143	0.0200
Gamma BHC	U		0.00145	0.0200
4,4-DDD	U		0.00156	0.0200
4,4-DDE	U		0.00154	0.0200
4,4-DDT	U		0.00200	0.0200
Dieldrin	U		0.00152	0.0200
Endosulfan I	U		0.00149	0.0200
Endosulfan II	U		0.00160	0.0200
Endosulfan sulfate	U		0.00151	0.0200
Endrin	U		0.00157	0.0200
Endrin aldehyde	U		0.00129	0.0200
Endrin ketone	U		0.00165	0.0200
Heptachlor	U		0.00154	0.0200
Heptachlor epoxide	U		0.00161	0.0200
Hexachlorobenzene	U		0.00124	0.0200
Methoxychlor	U		0.00178	0.0200
Chlordane	U		0.0390	0.200
Toxaphene	U		0.0360	0.400
(S) Decachlorobiphenyl	*84.3*			*10.0-143*
(S) Tetrachloro-m-xylene	*78.7*			*29.2-144*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3169394-1 10/10/16 10:58 • (LCSD) R3169394-2 10/10/16 11:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Aldrin	0.0667	0.0623	0.0634	93.4	95.1	65.8-124			1.81	20
Alpha BHC	0.0667	0.0607	0.0616	91.1	92.4	65.7-126			1.42	20
Beta BHC	0.0667	0.0622	0.0634	93.2	95.1	57.6-137			1.94	20
Delta BHC	0.0667	0.0618	0.0629	92.6	94.3	65.7-124			1.81	20
Gamma BHC	0.0667	0.0608	0.0613	91.2	92.0	64.5-121			0.860	20
4,4-DDD	0.0667	0.0633	0.0629	94.9	94.4	65.6-122			0.580	20
4,4-DDE	0.0667	0.0599	0.0605	89.9	90.7	61.9-132			0.960	20
4,4-DDT	0.0667	0.0649	0.0636	97.3	95.3	57.6-125			2.11	20
Dieldrin	0.0667	0.0636	0.0639	95.3	95.8	64.1-122			0.560	20
Endosulfan I	0.0667	0.0621	0.0629	93.0	94.3	62.0-121			1.33	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3169394-1 10/10/16 10:58 • (LCSD) R3169394-2 10/10/16 11:11

Analyte	Spike Amount mg/kg	LCS Result mg/kg	LCSD Result mg/kg	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Endosulfan II	0.0667	0.0639	0.0637	95.8	95.5	64.2-117			0.280	20
Endosulfan sulfate	0.0667	0.0611	0.0615	91.5	92.2	58.3-128			0.720	20
Endrin	0.0667	0.0635	0.0624	95.2	93.5	53.6-127			1.81	20
Endrin aldehyde	0.0667	0.0548	0.0559	82.1	83.8	37.4-130			2.04	20
Endrin ketone	0.0667	0.0617	0.0619	92.4	92.8	63.0-121			0.430	20
Heptachlor	0.0667	0.0629	0.0634	94.4	95.1	66.4-118			0.750	20
Heptachlor epoxide	0.0667	0.0613	0.0623	91.9	93.4	60.6-132			1.59	20
Hexachlorobenzene	0.0667	0.0590	0.0593	88.4	89.0	57.6-131			0.620	20
Methoxychlor	0.0667	0.0615	0.0604	92.3	90.6	54.8-131			1.83	20
(S) Decachlorobiphenyl				*91.1*	*90.1*	*10.0-143*				
(S) Tetrachloro-m-xylene				*84.4*	*84.2*	*29.2-144*				

L864107-01 Original Sample (OS) • Matrix Spike (MS) • Matrix Spike Duplicate (MSD)

(OS) L864107-01 10/10/16 12:03 • (MS) R3169394-4 10/10/16 12:17 • (MSD) R3169394-5 10/10/16 12:30

Analyte	Spike Amount (dry) mg/kg	Original Result (dry) mg/kg	MS Result (dry) mg/kg	MSD Result (dry) mg/kg	MS Rec. %	MSD Rec. %	Dilution	Rec. Limits %	MS Qualifier	MSD Qualifier	RPD %	RPD Limits %
Aldrin	0.0675	ND	0.0590	0.0568	87.5	84.1	1	20.2-150			3.92	20
Alpha BHC	0.0675	ND	0.0584	0.0563	86.6	83.4	1	35.3-155			3.76	20
Beta BHC	0.0675	ND	0.0592	0.0572	87.7	84.8	1	30.4-160			3.40	20
Delta BHC	0.0675	ND	0.0594	0.0574	87.9	85.0	1	27.8-160			3.43	20
Gamma BHC	0.0675	ND	0.0583	0.0562	86.3	83.3	1	32.6-149			3.56	20
4,4-DDD	0.0675	ND	0.0606	0.0557	89.7	82.6	1	33.0-145			8.31	20
4,4-DDE	0.0675	ND	0.0569	0.0544	84.2	80.6	1	26.3-151			4.36	20
4,4-DDT	0.0675	ND	0.0562	0.0539	83.3	79.8	1	11.8-145			4.31	23.8
Dieldrin	0.0675	ND	0.0609	0.0587	90.2	87.0	1	24.8-149			3.63	20
Endosulfan I	0.0675	ND	0.0600	0.0577	88.8	85.5	1	20.7-152			3.78	20
Endosulfan II	0.0675	ND	0.0620	0.0582	91.9	86.2	1	22.1-150			6.41	20
Endosulfan sulfate	0.0675	ND	0.0557	0.0550	82.5	81.5	1	24.6-151			1.21	21.5
Endrin	0.0675	ND	0.0601	0.0565	89.1	83.7	1	27.3-149			6.22	21.2
Endrin aldehyde	0.0675	ND	0.0540	0.0530	80.0	78.5	1	11.0-157			1.89	20
Endrin ketone	0.0675	ND	0.0561	0.0545	83.1	80.8	1	28.5-148			2.85	20
Heptachlor	0.0675	ND	0.0591	0.0568	87.5	84.2	1	26.7-144			3.92	20
Heptachlor epoxide	0.0675	ND	0.0594	0.0573	88.0	84.8	1	25.2-155			3.71	20
Hexachlorobenzene	0.0675	ND	0.0564	0.0538	83.5	79.7	1	19.0-156			4.71	20
Methoxychlor	0.0675	ND	0.0526	0.0514	77.9	76.1	1	10.0-165			2.30	25.4
(S) Decachlorobiphenyl					*80.3*	*76.9*		*10.0-143*				
(S) Tetrachloro-m-xylene					*77.0*	*72.8*		*29.2-144*				

Abbreviations and Definitions

SDG	Sample Delivery Group.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
ND	Not detected at the Reporting Limit (or MDL where applicable).
U	Not detected at the Reporting Limit (or MDL where applicable).
RPD	Relative Percent Difference.
(dry)	Results are reported based on the dry weight of the sample. [this will only be present on a dry report basis for soils].
Original Sample	The non-spiked sample in the prep batch used to determine the Relative Percent Difference (RPD) from a quality control sample. The Original Sample may not be included within the reported SDG.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Rec.	Recovery.

Qualifier	Description
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL).
J	The identification of the analyte is acceptable; the reported value is an estimate.
J3	The associated batch QC was outside the established quality control range for precision.
J4	The associated batch QC was outside the established quality control range for accuracy.
J5	The sample matrix interfered with the ability to make any accurate determination; spike value is high.
J6	The sample matrix interfered with the ability to make any accurate determination; spike value is low.

ESC Lab Sciences is the only environmental laboratory accredited/certified to support your work nationwide from one location. One phone call, one point of contact, one laboratory. No other lab is as accessible or prepared to handle your needs throughout the country. Our capacity and capability from our single location laboratory is comparable to the collective totals of the network laboratories in our industry. The most significant benefit to our "one location" design is the design of our laboratory campus. The model is conducive to accelerated productivity, decreasing turn-around time, and preventing cross contamination, thus protecting sample integrity. Our focus on premium quality and prompt service allows us to be **YOUR LAB OF CHOICE.**
***** Not all certifications held by the laboratory are applicable to the results reported in the attached report.

State Accreditations

Alabama	40660	Nevada	TN-03-2002-34
Alaska	UST-080	New Hampshire	2975
Arizona	AZ0612	New Jersey–NELAP	TN002
Arkansas	88-0469	New Mexico	TN00003
California	01157CA	New York	11742
Colorado	TN00003	North Carolina	Env375
Conneticut	PH-0197	North Carolina [1]	DW21704
Florida	E87487	North Carolina [2]	41
Georgia	NELAP	North Dakota	R-140
Georgia [1]	923	Ohio–VAP	CL0069
Idaho	TN00003	Oklahoma	9915
Illinois	200008	Oregon	TN200002
Indiana	C-TN-01	Pennsylvania	68-02979
Iowa	364	Rhode Island	221
Kansas	E-10277	South Carolina	84004
Kentucky [1]	90010	South Dakota	n/a
Kentucky [2]	16	Tennessee [1 4]	2006
Louisiana	AI30792	Texas	T 104704245-07-TX
Maine	TN0002	Texas [5]	LAB0152
Maryland	324	Utah	6157585858
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	109
Minnesota	047-999-395	Washington	C1915
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	9980939910
Montana	CERT0086	Wyoming	A2LA
Nebraska	NE-OS-15-05		

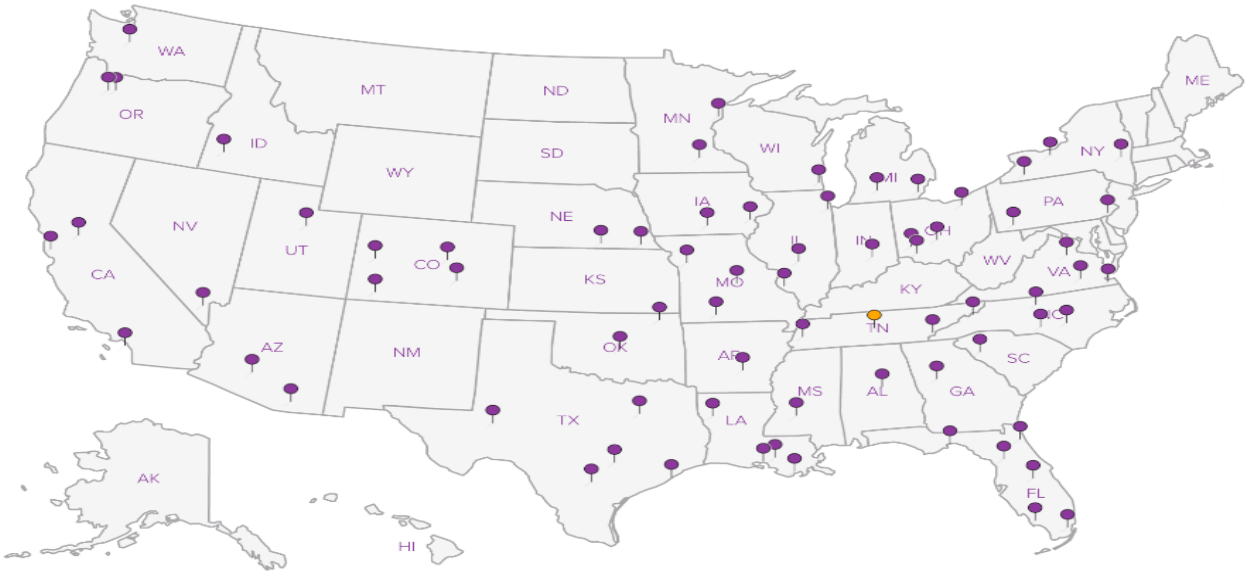
Third Party & Federal Accreditations

A2LA – ISO 17025	1461.01	AIHA	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	S-67674
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [n/a] Accreditation not applicable

Our Locations

ESC Lab Sciences has sixty-four client support centers that provide sample pickup and/or the delivery of sampling supplies. If you would like assistance from one of our support offices, please contact our main office. **ESC Lab Sciences performs all testing at our central laboratory.**



Company Name/Address:
PBS Engineering & Environmen
400 Bradley Blvd. Ste 300
Richland, WA 99352

Billing Information:
PBS Engineering & Environmental
400 Bradley Blvd. Ste 300
Richland, WA 99352

Report to: **Adam Swenson**

Email To: **adam.swenson@pbsenv.com**

Project Description: **Richland Army National Guard Building**

City/State Collected: **Richland, WA**

Phone: **509-375-7844**
Fax:

Client Project # **64395.000**

Lab Project # Normal TAT

Collected by (print): **Adam Swenson**

Site/Facility ID #

P.O. #

Collected by (signature):

Immediately Packed on Ice N ____ Y ✓

Rush? (Lab MUST Be Notified)
____ Same Day 200%
____ Next Day 100%
____ Two Day 50%
____ Three Day 25%

Date Results Needed: Normal TAT

Email? ___No ✓Yes
FAX? ✓No ___Yes

Analysis / Container / Preservative

Sample ID	Comp/Grab	Matrix *	Depth	Date	Time	No. of Cntrs	Pesticides, OP Pesticides, Cl Acid Herbicides	Solid Soils, California title, 22 metals list	Rem./Contaminant	Sample # (lab only)
TP-1	Grab	SS	1	10/4/16	7:53	2	X	X		-01
TP-2	Grab	SS	1	10/4/16	8:03	3	X	X		-02
TP-3	Grab	SS	1	10/4/16	8:27	3	X	X		-03
TP-4	Grab	SS	1	10/4/16	8:51	3	X	X		-04
TP-5	Grab	SS	1	10/4/16	9:00	3	X	X		-05
TP-6	Grab	SS	1	10/4/16	10:14	3	X	X		-06
TP-7	Grab	SS	1	10/4/16	10:07	3	X	X		-07
TP-8	Grab	SS	1	10/4/16	9:56	3	X	X		-08
TP-9	Grab	SS	1	10/4/16	9:09	3	X	X		-09
TP-10	Grab	SS	1	10/4/16	9:22	3	X	X		-10

* Matrix: **SS** - Soil **GW** - Groundwater **WW** - WasteWater **DW** - Drinking Water **OT** - Other_____

Remarks:

pH _____ Temp _____

Flow _____ Other _____

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
[signature]	10/4/16	14:45	[signature]
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
[signature]			[signature]
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			[signature]

Samples returned via: ☐ UPS ☐ FedEx ☐ Courier ☐ _____

Temp: 2.6 °C Bottles Received: 29

Date: 10/5/16 Time: 0900

Hold #

Condition: (lab use only) JW7

COC Seal Intact: ___Y ___N ___NA ✓ 05

pH Checked: NCF:

Chain of Custody Page ___ of ___

ESC LAB SCIENCES
YOUR LAB OF CHOICE
12065 Lebanon Rd
Mount Juliet, TN 37122
Phone: 615-758-5858
Phone: 800-767-5859
Fax: 615-758-5859

L # L864107
G227

Acctnum:
Template:
Prelogin:
TSR:
PB:
Shipped Via:

ESC
L·A·B S·C·I·E·N·C·E·S
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Cooler Receipt Form

Client: PBS ENGRWA	SDG#	L864107
Cooler Received/Opened On: 10/ 05 /16	Temperature Upon Receipt:	2.6 °c
Received By: Jeremy Watkins		
Signature: Jeremy Watkins		

Receipt Check List	Yes	No	N/A
Were custody seals on outside of cooler and intact?			✓
Were custody papers properly filled out?	✓		
Did all bottles arrive in good condition?	✓		
Were correct bottles used for the analyses requested?	✓		
Was sufficient amount of sample sent in each bottle?	✓		
Were all applicable sample containers correctly preserved and checked for preservation? (Any not in accepted range noted on COC)			✓
If applicable, was an observable VOA headspace present?			
Non Conformance Generated. (If yes see attached NCF)			✓

STATE OF WASHINGTON
MILITARY DEPARTMENT

The Washington Military Department/Washington Army National Guard
Standard Operating Plan and Procedures for the
Inadvertent Discovery of Potential Cultural Materials
And Human Skeletal Remains

PROJECT TITLE: Richland (Tri-Cities) Readiness Center Construction in Benton County, WA

PROJECT LOCATION: Richland, WA

SECTION, TOWNSHIP, RANGE:
SW 1/4 SE 1/4 Section 21 Township 10 N, Range 28 E
2675 1st Street, Richland, WA 99354

CONTACT:
Elizabeth Murphy, Cultural Resources Manager
WA Army National Guard (WAARNG)/Washington Military Department (WMD)
36 Quartermaster Rd., Camp Murray, WA 98430
253-325-0537
Elizabeth.murphy@mil.wa.gov

EMERGENCY CONTACT:
Susan Vezeau, Environmental Programs Supervisor
253-242-0486

I. Background

1. **Scope:** The following Inadvertent Discovery Plan (IDP) outlines the procedures to take in the event of discovery of cultural resources, including historic/prehistoric archaeological materials or human remains.

   All personnel, including state and federal employees, contractors, subcontractors, and tenants will follow this plan, in accordance with state and federal laws

2. **Statutory Reference(s):**

   - Native American Graves Protection and Repatriation Act (NAGPRA) and its implementing regulation (43 CFR 10)
   - Archaeological Resources Protection Act (ARPA)
   - National Historic Preservation Act (NHPA) and its implementing regulation (36 CFR 800)
   - Washington State RCW 27.53

3. Applicability:

a. The following typical actions trigger this SOP:
- Field training exercises
- Construction and maintenance
- Activities such as digging, bulldozing, clearing or grubbing
- Off-road traffic
- General observations (i.e., eroded areas, gullies, trails)
- Ground testing and soil boring

b. Identification of Cultural Resources

Cultural Resources can be historic or prehistoric. They include skeletal bones, village sites, and Native American objects and artifacts. Historic cultural resources are over 50 years, and include settlements, infrastructure, building remains, and objects/artifacts. Examples include the following:

Type of Cultural Resource	Examples of Material
• Human Remains/Unmarked Graves	• Bones or small pieces of bone
• Prehistoric site • Prehistoric artifacts	• An accumulation of shell, burned rocks, or other food-related items • Charcoal or dark stained soil with artifacts • Stone tools, waste flakes, or human-altered rock
• Historic site • Historic artifacts	• Old foundations • Old privies • Clusters of tin cans or bottles, logging or agricultural equipment older than 50 years
• Historic infrastructure	• Buried railroad tracks, decking, or other industrial material

II. ACTIONS

1. Initial On-Site Discovery (applies to units, personnel, contractors, subcontractors, employees)

   STEP 1: **STOP WORK.** If any person on-site identifies a cultural resource or believes that a cultural resource may have been identified, **all ground-disturbing work on the project** must stop immediately.

   STEP 2: **NOTIFY** the Cultural Resource Managers at Camp Murray

   - Business Hours: Call both 253-325-0537 AND 253-242-0486
   - After Hours/Emergency: Call 253-242-0486

   STEP 3: **SECURE** the discovery location. Secure the area to ensure that unauthorized persons do not enter or further disturb the area. Mark the area of discovery for further investigation.

   STEP 4: **WAIT** until the area is cleared by the Cultural Resource Manager. Activity may not resume in area of discovery until cleared by the CRM. Anticipate a minimum of 30 days.

2. WMD/WAARNG Response (Cultural Resource Manager)

   STEP 1: Ensure that activities have ceased at the discovery site and that the site has been secured from human and natural forces

   STEP 2: Notify the Washington State Department of Archaeology and Historic Preservation (DAHP) State Historic Preservation Officer (SHPO) by phone. Follow-up with a notification in writing.

   - SHPO/Director: Dr. Allyson Brooks, (360) 586-3066
   - Deputy SHPO: Greg Griffith, (360) 586-3073 (office)/(360) 890-2617(cell)

   STEP 3: Notify the Tribal Historic Preservation Officer (THPO) for the affect tribes by phone. Follow-up with a notification in writing.

   - Colville Confederated Tribes: Guy Moura, *THPO,* 509-634-2695
   - Confederated Tribes of the Umatilla Indian Reservation: Holly Shea Barrick, Senior Archaeologist, 541-429-7204
   - Nez Perce Tribe: Aaron Mile, Sr. Acting Director, 208-621-3847
   - Wanapum Tribe: Rex Buck, Jr. Chair, 509-764-0500 ext. 3113
   - Confederated Tribes and Bands of the Yakama Nation*: Kate Valdez, THPO, 509-985-7596*

STEP 4: If human remains are known or suspected to be present, also promptly notify the DAHP State Physical Anthropologist, state police and medical examiner, and if federal property, the FBI. Notify the WAARNG JAG.

- DAHP State Anthropologist: Dr. Guy Tasa, Office: (360) 586-3534, Cell: (360) 790-1633
- State Police: 911
- Benton County Medical Examiner: 541-766-6815
- FBI, Seattle Division, (206) 622-0460
- WAARNG JAG: (253) 512-8262

STEP 5: Visit the location of the discovery within 24 hours of the find. The services of appropriate technical experts (e.g., archaeologists, specialists in human osteology, forensic anthropologists) may be retained to participate in the field visit.

STEP 6: If the CRM has reason to believe that American Indian human remains, funerary objects, sacred objects, or objects of cultural patrimony have been discovered, the CRM must provide immediate telephone notification of the discovery, along with written notification by certified mail, to ARNG.

STEP 7: The CRM will follow NAGPRA and NHPA Section 106 procedures and consult with interested parties (SHPO, Tribes, property owner) to discuss disposition of cultural resources and appropriate mitigation measures. The CRM, in consultation with the SHPO and tribes, as appropriate, will determine the procedures for disposition and control of any American Indian cultural items excavated or removed as a result of inadvertent discoveries.

STEP 8: The CRM will notify the project managers that work can resume only when identification of the discovered items and agreement for protection, mitigation, or recovery has been achieved to the satisfaction of all interested parties (SHPO, Tribes, ARNG, ACHP).

STATE OF WASHINGTON
MILITARY DEPARTMENT

STANDARD OPERATING PROCEDURE
Inadvertent Discovery of Potential Cultural Resource

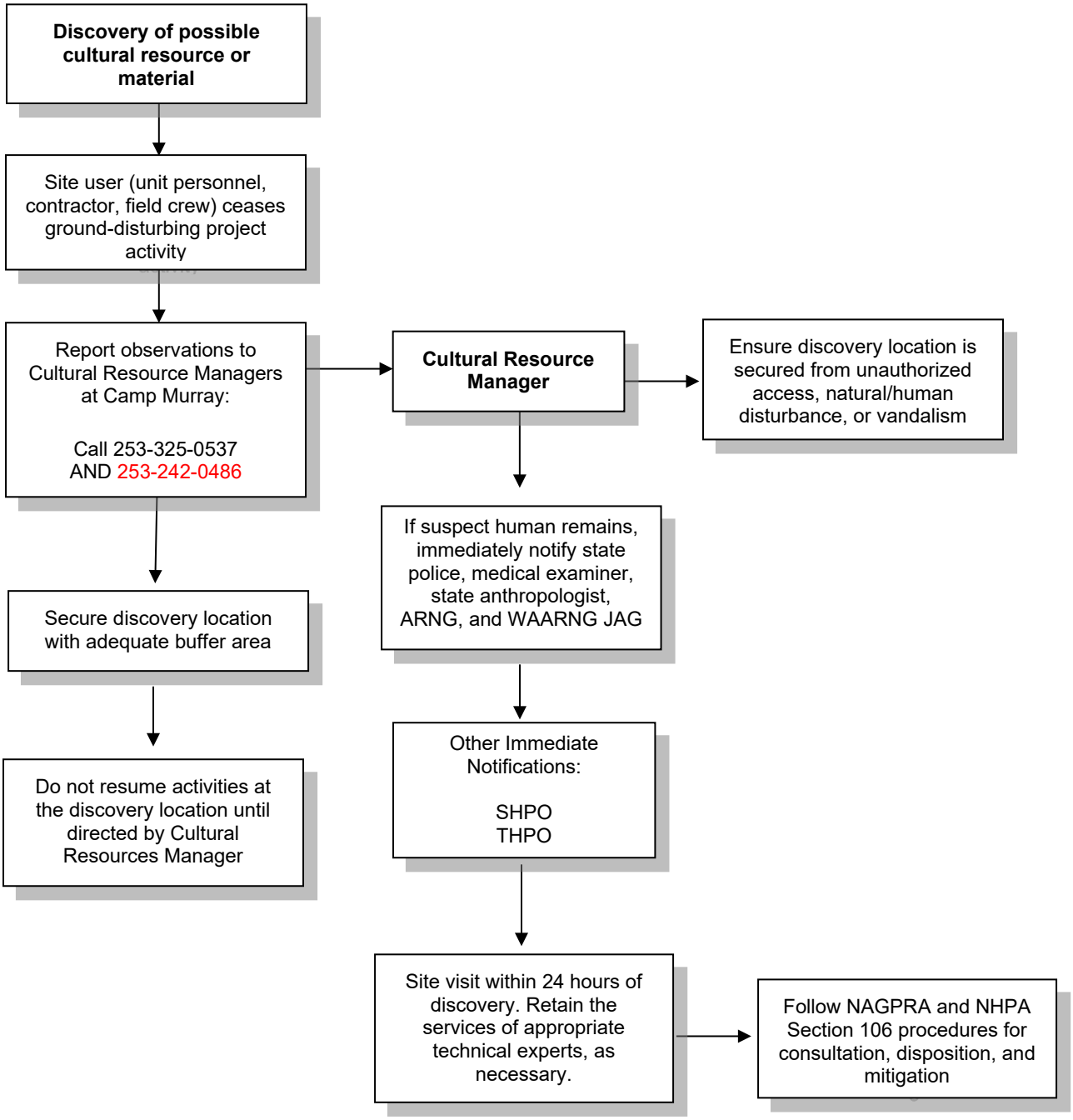

Figure 3-5. Flow Chart for the Inadvertent Discovery of Potential Cultural Resource

NATIONAL GUARD BUREAU
111 SOUTH GEORGE MASON DRIVE
ARLINGTON VA 22204-1373

ARNG-IEM 15 February 2018

MEMORANDUM FOR ARNG-IER (CPT Kopczynski), 111 S. George Mason Drive, Arlington, VA 22204

SUBJECT: Review of National Environmental Policy Act (NEPA) Requirements for FY20 Richland Readiness Center Construction, Project #531201, Richland, Washington

1. References:

a. ARNG Record of Environmental Consideration and Checklist, Washington Army National Guard (WAARNG), 22 November 2017. Subject: Construction of a Richland (Tri-Cities) Readiness Center in Benton County, Washington.

b. 32 CFR Part 651, Environmental Analysis of Army Actions, 29 March 2002.

c. The Army National Guard NEPA Handbook, Guidance on Preparing Environmental Documentation for Army National Guard Actions in Compliance with the National Environmental Policy Act of 1969 (Final), 1 October 2011.

2. The Washington Army National Guard (WAARNG) proposes to construct a Readiness Center in the north-central portion of an approximately 40 acre parcel in Benton County, Richland, WA. The Readiness Center (RC) will be nearly 40,000 square feet in size, and encompass approximately 10 acres. All 40 of the acres has been previously disturbed. The RC will be used mainly by WAARNG and Active Guard Soldiers as a permanent duty station on monthly drill weekends. This new RC will fulfill a stationing void that was created when the lease on the Bellingham Armory recently expired.

4. The Record of Environmental Consideration (REC) and Checklist for the action (reference 1a) documents NEPA compliance and is prepared in accordance with references 1b and 1c. The Categorical Exclusion appropriate for the proposed action is (c)(1): Construction of an addition to an existing structure or new construction on a previously disturbed site, if the area to be disturbed has no more than 5.0 cumulative acres of new surface disturbance. This does not include construction of facilities for the transportation, distribution, use, storage, treatment, and disposal of solid waste, medical waste, and hazardous waste (REC required).

5. The appropriate Environmental Condition of Property (ECOP) document, a Pre-Construction Assessment, is required to be transmitted to the NEPA/ECOP Team at a minimum of 12 months prior to construction of the Readiness Center. Additionally, the

REC and Checklist (reference 1a) will be required to be updated at the same time as when the ECOP document is submitted.

5. The point of contact is Mr. Benjamin B. Wallen, ECOP/NEPA Program Manager, 703-607-0932 or benjamin.b.wallen.civ@mail.mil.

WILFORD U. GRIEGO
CPT, EN
NEPA/ECOP Team Lead

CF: (wo/encls)
ARNG-IEC (Ms. Davis)
WAARNG (Dr. Valencia-Gica, Ms. Murphy)

Enviro Tracking #:	ARNG ENVIRONMENTAL CHECKLIST	State ARNG
17-MC-01	Enter information in the yellow shaded areas.	WAARNG

PART A - PROJECT INFORMATION

1. PROJECT NAME:

Construction of a Richland (Tri-Cities) Readiness Center in Benton County, Washington

2. PROJECT NUMBER: (MILCON if applicable)	3. DATE PREPARED:
531201	04-Aug-2020

4. DESCRIPTION AND LOCATION OF THE PROJECT/PROPOSED ACTION:

a. Location (Include a detailed map, if applicable):

The proposed Richland Readiness Center will be sited in the north central portion of the 39.93-acre Benton County parcel no. 121084000006005 located in the SW quarter of the SE quarter of Township 10 N, Range

b. Description:

The WAARNG proposes to construct a 39,731-square foot, one story National Guard Readiness Center, with associated parking areas and detached storage buildings. The facility will be sited on 10 acres of a 39.93-acre parcel bought by the WAARNG from the City of Richland in Benton County, Washington. The proposed Readiness Center will be used by an estimated 150 WAARNG Soldiers on their monthly drill

c. The proposed action will involve (check all that apply):

- ☐ Training activities/areas
- ☐ Maintenance/repair/rehabilitation
- ☐ Innovative readiness training project
- ☐ Other (Explain):
- ■ Construction
- ☐ Real estate action
- ☐ Natural resource management
- ☐ Environmental plans/surveys

d. Project size (acres): 39.93 (if applicable) Acres of new surface disturbance (proposed): 0 (if applicable)

5. START DATE of PROPOSED ACTION (dd-mmm-yy):	01-OCT-20	Note: This must be a future date.
6. PROGRAMMED FISCAL YEAR (if applicable):	FY20	
7. END DATE (if applicable):	31-MAR-22	

PART B - DECISION ANALYSIS GUIDE

To use a categorical exclusion, the project must satisfy the following three screening criteria: no segmentation, no exceptional circumstances and a qualifying categorical exclusion that covers the project. The following decision tree will guide the application and documentation of these three screening criteria. The criteria were extracted from 32 CFR Section 651.29 and represent the most common screening conditions experienced in the ARNG. NOTE: Each question in Part B must have an applicable block checked for concurrence with REC.

1. Is this action segmented (the scope of the action must include the consideration of connected, cumulative, and similar actions)? ☐ YES (go to #30) ■ NO (go to #2)

2. Is there reasonable likelihood of significant environmental effects (direct, indirect,and cumulative)? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question. ☐ YES (go to #30) ■ NO (go to #3)

3. Is there a reasonable likelihood of significant effects on public health, safety or the environment? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question. ☐ YES (go to #30) ■ NO (go to #4)

4. Is there an imposition of uncertain or unique environmental risks? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question. ☐ YES (go to #30) ■ NO (go to #5)

5. Is the project of greater scope or size than is normal for the category of action? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question. ☐ YES (go to #30) ■ NO (go to #6)

6. Does the project introduce or employ unproven technology? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question. ☐ YES (go to #30) ■ NO (go to #7)

PART B - DECISION ANALYSIS (continued)

7. Will there be reportable releases of hazardous or toxic substances as specified in 40 CFR Part 302? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ■ NO (go to #8)

8. If proposed action is in a non-attainment or maintenance area, will air emissions exceed de minimus levels or otherwise require a formal Clean Air Act (CAA) conformity determination? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question. ☐ YES (go to #30) ■ NO (go to #9) ☐ NA (go to #9)

9. Will the project have effects on the quality of the environment that are likely to be highly controversial? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question.

☐ YES (go to #30) ■ NO (go to #10)

10. Will the project establish a precedent (or make decisions in principle) for future or subsequent actions that are reasonably likely to have future significant effects? If action meets screening criteria but is assessed in an existing EA or EIS, check NO and proceed to the next question. ☐ YES (go to #30) ■ NO (go to #11)

11. Has federal funding been secured for the Innovative Readiness Training (IRT) project?

■ N/A (go to #13) ☐ YES (go to #13) ☐ NO (go to #12)

12. NOTE: IRT projects not currently funded can secure approved NEPA documentation. However, once funding is secured State ARNG is required to coordinate with ARNG-ILE-T to complete natural and cultural surveys via proponent funding.

☐ CONFIRMED (go to #27)

13. Do you have a species list from the U.S. Fish and Wildlife Service that is less than 90 days old?

■ YES (go to #14) Date of List: 07 AUG 2020 ☐ NO (update species list return to #13)

14. In reviewing the species list, what determination was made by the State ARNG?

■ No species present (go to #16)
☐ No affect (go to #16)
☐ May affect but not likely to adversely affect (go to # Date of USFWS concurrence:
☐ May affect likely to adversely affect (go to #15)

15. Does an existing Biological Opinion cover the action?

☐ YES (go to #16) Date of BO: ☐ NO (go to #30)

16. Have the Endangered Species Act, Section 7 requirements completed?

■ YES (go to #17) Date of Documentation: 07 AUG 2020 ☐ NO (complete documentation, return to #16)

17. Does the project involve an undertaking to a building or structure that is 50 years of age or older?

☐ YES (go to #18) ■ NO (go to #20)

18. Has the building or structure been surveyed for the National Register of Historic Places?

☐ YES (go to #19) ☐ NO (complete inventory, return to #18)

19. Is the building or structure eligible for or listed on the National Register of Historic Places?

☐ YES (go to #20) ☐ NO (go to #20)

20. Does the action involve ground disturbing activities?

■ YES (go to #21) ☐ NO (go to #22)

21. Has an archaeological inventory or research been completed to determine if there are any archeological resources present?

■ YES (go to #22) ☐ NO (complete inventory or conduct research, return to #21)

22. In reviewing the undertaking, under the National Historic Preservation Act (NHPA) (for both above and below ground resources), what determination was made by the State ARNG?

☐ No 106 undertaking; no additional consultation required under NHPA (go to question #27)
■ No properties affected (go to #24) Date of SHPO Concurrence: 29-AUG-2017
☐ No adverse effect (go to #24) Date of SHPO Concurrence:
☐ Adverse effect (go to #23)

23. Has the State ARNG addressed the adverse effect?

☐ YES (place date of MOA or existing PA and explanation of mitigation in box below, go to #24) ☐ NO (go to #30)

23a.

PART B - DECISION ANALYSIS (continued)

24. Per DoDI 4710.02 did the state ARNG determine that tribal consultation was necessary for this project?

■ YES (go to #25)

☐ NO (Provide reason in this block 24a, go to #27)

24a. Informal tribal consultation via phone and email initiated in January 2017 with CTUIR, Nez Perce, Wanapum, and Yakama Nation tribes to assess need for archaeological survey. Survey conducted in March 2017 and consultation letter requesting survey concurrence sent to the Nez Perce, Wanapum, CTUIR, Colville, and Yakama tribes on 24-Aug-2017.

25. Did the Tribes express an interest or respond with concerns about the project?

■ YES (go to #26) ☐ NO (go to #27) Date of Documentation: 21-Sept-2017

26. Has the State ARNG addressed the Tribal concerns?

■ YES (place date of MOU or explanation of how State ARNG addressed tribal concerns in box below, go to #27)

☐ NO (address concerns, return to #26)

Complete only if additional documentation is required in question #26

26a. CTUIR noted the existence of several historic properties of religious and cultural significance located along the waterways surrounding the site.CTUIR requested that an inadvertent discovery plan for cultural resources and human remains be in place prior to the start of construction. WMD concurred and will provide a plan for review prior to construction.

27. Does the project involve an unresolved effect on areas having special designation or recognition such as those listed below? For any yes responses go to #30 otherwise go to #28. If any No response is a result of negotiated and/or previously resolved effects please describe resolution in box 27a below.

TYPE	Unresolved Effects?	TYPE	Unresolved Effects?
a. Prime/Unique Farmland	no	e. Wild/Scenic River	no
b. Wilderness Area/National Park	no	f. Coastal Zones	no
c. Sole-Source Aquifer	no	g. 100-year Floodplains	no
d. Wetlands	no	h. National Wildlife Refuges	no

27a.

28. Is this project addressed in a separate EA or EIS review?

☐ YES (complete table below; go to Part C, Determination) ■ NO (go to #29)

Document Title:	
Lead Agency:	
Date of Decision Document:	

29. Does the project meet at least one of the categorical exclusions listed in 32 CFR 651 App B?

☐ YES (complete table below; go to Part C, Determination) ☐ NO (go to #30)

List primary CAT EX code	C-1: Construction of an addition to an existing structure or new…
Descibe why CAT EX applies	The project involves construction in a previously disturbed site (>5 ac) having been used for agricultural activities since the early 20th century, does not involve any controversy, and has no unresolved effects nor effects on threatened/endangered species and cultural/archaeological resources.

30. At this time your project has not met all the qualifications for using a categorical exclusion under 32 CFR 651. Unless the scope of the project is changed, it will require an Environmental Assessment or possibly an Environmental Impact Statement. If you feel this is in error, please call your NEPA Regional Manager to discuss. If needed, go to Part C Determination.

Additional Information (if needed):

*The species list from the U.S. Fish and Wildlife Service will be updated once the iPAC website is activated; currently closed due to the government shut-down.

1. Cultural/Archaeological Resources Survey completed March 31, 2017 (Attachment 1)

2. Biological Resources Survey completed June 26, 2017 (Attachment 2)

3. Preliminary Geotechnical Exploration completed October 18, 2016 (Attachment 3)

4. Pesticides and Metal Soil Contamination Survey completed October 20, 2016 (Attachment 4)

5. RONA prepared (Attachment 5)

6. MFR for NHPA Section 106 and NEPA review (Attachment 6)

PART C - DETERMINATION

On the basis of this initial evaluation, the following is appropriate:

- ☐ IAW 32 CFR 651 Appendix B, the proposed action qualifies for a Categorical Exclusion (CX) that does not require a Record of Environmental Consideration.
- ■ A Record of Environmental Consideration (REC).
- ☐ An Environmental Assessment (EA).
- ☐ A Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS).

	Susan Vezeau
Signature of Proponent (Requester)	Environmental Program Manager
COL Adam M. Iwaszuk	Susan Vezeau, Ph.D.
Printed Name of Proponent (Requester)	Printed Name of Env. Program Manager
	08/11/2020
Date Signed	Date Signed

Other concurrence (as needed):

Signature	Signature
Printed Name	Printed Name
Date Signed	Date Signed
Signature	Signature
Printed Name	Printed Name
Date Signed	Date Signed
Signature	Signature
Printed Name	Printed Name
Date Signed	Date Signed

Enviro Tracking #:	ARNG Record of Environmental Consideration	State ARNG
17-MC-01	Enter information in the yellow shaded areas.	WAARNG

1. PROJECT NAME:

Construction of a Richland (Tri-Cities) Readiness Center in Benton County, Washington

2. PROJECT NUMBER: (MILCON if applicable)	3. DATE PREPARED:
531201	04-Aug-2020

4. START DATE of PROPOSED ACTION (dd-mmm-yy):	01-OCT-2020	Note: This must be a future date
5. PROGRAMMED FISCAL YEAR:	FY20	
6. END DATE (if applicable):	31-MAR-22	

7. DESCRIPTION AND LOCATION OF THE PROPOSED ACTION:

a. Location (Include a detailed map, if applicable):

The proposed Richland Readiness Center will be sited in the north central portion of the 39.93-acre Benton County parcel no. 121084000006005 located in the SW quarter of the SE quarter of Township 10 N, Range 28 E, Section 21, Willamette Meridian with physical address of 2675 1st Street, Richland, WA 99354 (see attached map in ESA memo). The site is located in an undeveloped, agricultural setting approximately 2.3 miles northwest of the Richland Airport and 11 miles northwest of the City of Richland. The project area is bounded by 1st Street to the north, Polar Way to the east, Logan Street to the south, and several tax parcels along Kingsgate Way to the west.

b. Description:

The WAARNG proposes to construct a 39,731-square foot, one story National Guard Readiness Center, with associated parking areas and detached storage buildings. The facility will be sited on 10 acres of a 39.93-acre parcel bought by the WAARNG from the City of Richland in Benton County, Washington. The

8. CHOOSE **ONE** OF THE FOLLOWING:

☐ An existing environmental assessment* adequately covers the scope of this project. Attach FNSI if EA was completed by another federal agency (non-ARNG).

EA Date (dd-mmm-yy): Lead Agency:

☐ An existing environmental impact statement* adequately covers the scope of this project.

EIS Date (dd-mmm-yy): Lead Agency:

☒ After reviewing the screening criteria and completing the ARNG environmental checklist, this project qualifies for a

Categorical Exclusion Code: C-1: Construction of an addition to an existing structure or new…
See 32 CFR 651 App. B

Categorical Exclusion Code:
See 32 CFR 651 App. B

Categorical Exclusion Code:
See 32 CFR 651 App. B

☐ This project is exempt from NEPA requirements under the provisions of:

Cite superseding law:

*Copies of the referenced EA or EIS can be found in the ARNG Environmental Office within each state.

9. REMARKS:

See attached surveys/studies completed and MFRs.
*The species list from the U.S. Fish and Wildlife Service will be updated once the iPAC website is activated; currently closed due to the government shut-down.

	Susan Vezeau
Signature of Proponent (Requester)	Environmental Program Manager
COL Adam M. Iwaszuk	Susan Vezeau, Ph.D.
Printed Name of Proponent (Requester)	Printed Name of Env. Program Manager
	08/11/2020
Date Signed	Date Signed

Proponent Information:

10. Proponent:	WAARNG/CFMO
11. Address:	36 Quartermaster Rd., Camp Murray, WA
12. POC:	Col Adam Iwaszuk
13. Comm. Voice:	253-512-8702
14. Proponent POC e-mail:	adam.m.iwaszuk.mil@mail.mil