ECF-HANFORD-13-0020
Revision 5

Process for Constructing a Three-dimensional Geological Framework Model of the Hanford Site's 100 Area

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract DE-AC06-08RL14788

P.O. Box 1600
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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CH2M HILL Plateau Remediation Company

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By Julia Raymer at 3:52 pm, Aug 23, 2017

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ENVIRONMENTAL CALCULATION COVER PAGE

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2	Revised 100-Areas Geologic Framework Model (100-Areas_2015-01-06.lfview) using updated Geocontacts database	05/07/2015	All ☒
3	Revised 100-Areas Geologic Framework Model (100-Areas_2015-01-06.lfview) using updated Geocontacts database	08/24/2015	All ☒
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Licenses: Engineer in Training (EIT)

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Senior Reviewer: Bruce A. Williams

Senior Geologist

BS, Geological Engineering, Colorado School of Mines, 1980

Licenses: Washington State Engineering Geologist, Hydrogeologist, and Geologist

Bruce is a practicing hydrogeologist with 26 years of experience at Hanford in the areas of hydrology, geology, borehole geophysical log analysis and interpretation, environmental site characterization, groundwater monitoring, well installations, and conceptual site modeling. He has applied his expertise in these areas to help

solve problems of national importance in the areas of Resource Conservation and Recovery Act (RCRA)/Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial investigations and feasibility studies (RI/FS), radioactive waste disposal characterization and assessments, and demonstration of compliance with applicable waste disposal regulatory requirements. He has successfully led science and project teams in technical hydrogeological reporting, 3-D geologic and contaminant plume interpretations, development of characterization programs, and implementation and interpretation of borehole geologic and geophysical results supporting regulatory groundwater compliance, risk assessments, and petroleum exploration.

Environmental Calculation File

Process for Constructing a Three-dimensional Geological Framework Model of the Hanford Site 100 Area

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Terms

3D	three-dimensional
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
ECF	environmental calculation file
EDA	Environmental Dashboard Application
EMMA	Environmental Model Management Archive
GIS	geographic information system
HISI	Hanford Information Systems Inventory
Hf	Hanford formation (undifferentiated)
IDMS	Information Data Management System
LiDAR	Light Detection and Ranging
Rwie	Ringold Formation unit E
RUM	Ringold Formation upper mud unit (undifferentiated)
NAVD88	North American Vertical Datum 1988
LiDAR	Light Detection And Ranging
NAIP	National Agriculture Imagery Program
ODBC	Open Database Connectivity

1 Purpose

This environmental calculation file (ECF) provides background and details for the process used in constructing a three-dimensional (3D) geological framework model of the River Corridor (100 Area) at the Hanford Site. Leapfrog-Geo®[1] (version 3.0, ARANZ Geo Limited, LLC, 2013) is a powerful 3D geological modeling tool that utilizes existing geologic and hydrogeologic data to provide a 3D spatial representation of the subsurface. It is used as a visual tool that can be manipulated by the end user to illustrate and explore hydrogeologic features that control and constrain groundwater, and groundwater contaminant movement in the subsurface. These 3D model interpretations can be used during many stages of project development requiring hydrogeologic evaluations, to enhance and improve site characterization, conceptual model development, inputs to other modeling efforts, remedial process evaluations, and remedial action decisions. In addition, the portability of the models and associated viewer software allow visual presentations of complex hydrogeologic-to-contaminant relationships/issues to be easily presented, and greatly improve communications and interactions with regulators and the public.

The objective of this modeling effort is to provide an accurate representation of the subsurface hydrogeologic environment beneath contaminated waste disposal facilities to support other modeling needs (i.e., contaminant fate and transport), to make informed remedial action decisions, and as an educational tool for presenting complex hydrogeologic concepts and associations to the public. The model is constructed based on consistent and defensible 3D interpretations of the Hanford Site's extensive stratigraphic database (Attachment A of this ECF).

This model revision provides the 2016 updated 3D model results which utilized the GeoContacts_100-Area_2016-20-12. This data set includes the addition of 34 new boreholes to the model (Table 1 lists the FY 2016 boreholes added and revised since the last model revision), and refinements to the surfaces based on input from project staff. The revised 3D model name is: 100-Area_2016-12-20.lfview. Information for Reworked Ringold Formation unit E (RE) and Reworked Ringold upper mud (RUM) is also defined in this dataset and in the borehole profiles if the reworked unit was documented, however, the reworked unit volumes and surface extents were not generated in model interpolation because the data were not believed to be consistently definable for the entire well data set. Model revisions and supporting input data are available upon request to the preparer of this ECF, or to the CHPRC Risk and Modeling Integration Manager.

Table 1. Newly Added Borehole Data for GeoContacts_100-Area_2016_20_12

Well Name	xcoord[a]	ycoord[a]	Elevation (m)	TD (m)
199-D4-102	572750.41	151458.68	143.52	33.5
199-D4-103	572749.45	151243.34	143.68	33.7
199-D5-149	573327.62	151461.82	143.92	34.3
199-D5-150	573429.42	151401.85	143.88	33.9
199-D5-151	573312.03	151391.88	139.64	29.7
199-D5-152	573300.18	151349.10	139.01	29.9
199-D5-160	573517.16	151429.17	143.68	34.9
199-D8-102	573661.84	152076.09	142.58	34.7

[1] Leapfrog Geo is a registered trademark of ARANZ, Christchurch, New Zealand.

Table 1. Newly Added Borehole Data for GeoContacts_100-Area_2016_20_12

Well Name	xcoord[a]	ycoord[a]	Elevation (m)	TD (m)
199-H4-87	577736.16	152667.79	129.25	19.8
199-H4-88	577850.51	152833.59	130.92	18.3
199-H4-89	577923.32	152893.98	128.20	17.3
199-K-223	568781.07	146145.09	144.75	54.1
199-K-224	568735.26	146205.95	145.94	56.7
199-K-225	569281.59	146457.74	145.11	50.3
199-K-226	569186.87	147038.68	135.15	45.4
199-N-371	571133.65	149571.82	138.42	29.3
199-N-372	571104.79	149500.24	139.07	32.1
199-N-373	571276.14	149441.79	139.43	30.9
199-N-374	571116.32	149532.29	139.12	31.1
199-N-376	571137.72	149346.36	140.13	33.3
199-N-377	571277.91	149677.94	139.68	33.3
699-66-30	580895.57	143649.79	121.19	9.6
699-66-32	580059.33	143628.39	126.57	11.9
699-67-26	581949.54	143798.07	120.79	12.6
699-71-26	581918.55	145176.00	121.34	12.4
699-71-34	579602.08	145271.21	120.95	11.2
699-75-28	581538.22	146514.93	125.07	18.0
699-75-31	580385.85	146516.19	123.21	12.4
699-75-34	579477.05	146444.09	122.45	13.6
699-75-34B	579478.30	146447.03	122.63	12.8
699-88-41A	577406.82	150957.60	127.93	18.0
699-90-45B	576441.52	150967.00	129.67	20.9
699-90-47B	575298.23	150951.48	130.18	20.5
699-93-37A	578449.32	151455.62	125.37	20.3

TD = total depth

a. Horizontal coordinate system is WCS83S (m); vertical datum is NAD 1988 Zone

2 Background

Leapfrog-Geo (version 3.0.0, ARANZ Geo Limited, LLC, 2013) utilizes radial basis functions to construct 3D interpolations based on borehole stratigraphic contact elevations to create continuous geologic surfaces.

If the user is so inclined to create these surfaces with a different geo-statistical function (i.e., ordinary kriging, inverse distance weighting), then surfaces can be created using any geographic information system (GIS) tool to generate a continuous gridded surface, and theses surfaces can be imported into Leapfrog. However, given the Leapfrog workflow paradigm, it is much more practical, and time effective to use the proprietary interpolation function (radial basis function), and manage the model consistently within Leapfrog software. The Information Data Management System (IDMS) and the 100-Area GeoContacts datasets provide the borehole, lithology data, and interpreted lithologic unit contacts used with the Leapfrog proprietary interpolation function to generate the models.

The 3D geologic solid model is updated periodically as borehole, or lithology datasets are updated or as interpretations change. Data inputs and configuration files will be available concurrently with each release of the model, however, there is additional qualitative information used in each model version. The process of creating the 3D solids model will be repeatable to a certain extent based solely on using the same input data provided with each version.

Additionally, data from boreholes, such as location, surface elevation, casing, and depth to geologic units, can be dynamically linked to an underlying data base using Open Database Connectivity (ODBC). And consequently, changes to the model can be made concurrently with changes to the database, as opposed to uploading new flat files. Supporting data is also imported and uploaded to the model to provide improved spatial representation and orientation for the end user. This includes, for example, Light Detection and Ranging (LiDAR) based ground surface layers, river bathymetry, and facility location information. In addition, user-specified layers can be imported to support multiple projects, i.e., water table surfaces, contaminant plume interpretations, etc.

3 Methodology

The Leapfrog workflow overview for creating the Hanford Site 3D geoframework solids models follows a generalized and consistent workflow structure that is used in the construction of the 100-Area 3D model. In summary, interpreted lithology from borehole data is used to define geologic contact points as subsurface elevations (ECF-100NPL-11-0070, *100 Area Stratigraphic Database Development*). These data inputs are interpolated within the Leapfrog-Geo framework to provide geological model surfaces that form the upper (e.g., surface elevation) and lower bounding surface constraints of the geologic intervals that, combined together, represent the solid model. The basic methodology for development and construction of a 3D solids model is as follows:

a. Define the model boundary and gather the site-specific descriptions and stratigraphic data for constructing the geologic layers of the model.

b. Run the model to generate the surface interpolations needed to assemble the geologic surface/layer components of the solid model. Subtract from the top down, or add from the bottom up, the interpolated surfaces to generate the volume and spatial orientation of each geologic unit. Apply additional control points as necessary to constrain known or desired stratigraphic or structural features (e.g., pinch-outs, faults, etc.) within the model volume.

c. Save the new model as a unique 3D geologic model 'scene' for visual exploration and graphic presentations. Retain copies and records of all data used in the model in user accessible folders on PRC-Spatial.

Figure 1 depicts the lateral boundaries used to define the 100-Area model construction. For the 100 Area model, the Columbia River boundary forms the northern and eastern boundary and the Gable Mountain-Gable Butte basalt subcrop and uplift above ground surface forms the southern boundary. The western boundary is defined by the north-to-south transect located just upgradient of the westernmost 100-Area operational area (100-B/C Operable Unit). The basalt sub-crops and exposures are assumed to be impermeable boundaries and form the basement rock underlying the entire Hanford Site. The surface of the basalt represents the bottom layer of Leapfrog-Geo model.

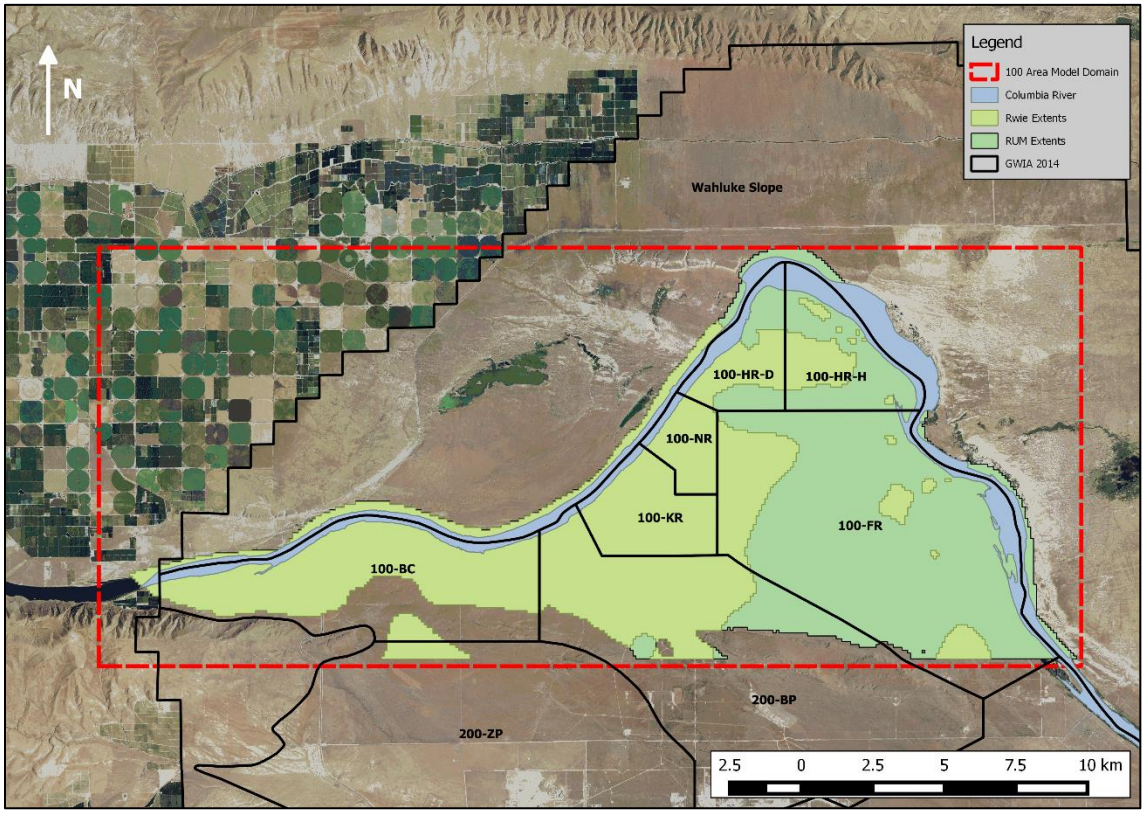

Figure 1. 100 Area Model Boundary and Extents of Ringold Formation Unit E and RUM Hydrogeologic Units

3.1 Building a Geological Model

A geological model is the fundamental method for describing and ordering lithological units in Leapfrog-Geo. Building the geological model in Leapfrog-Geo is a process of successive refinements made up of defining the model's boundary extents and building the internal structures. The geological model consists of a number of non-intersecting volumes that fit together to exactly fill a 3D boundary defined by the model top and bottom extents. The geological model is usually built from oldest lithologic unit to youngest lithologic unit or from youngest to oldest. At Hanford, the model boundary extents default to the topographic and top of basalt layers, but different lateral extents can be made, if desired.

Two-dimensional lithological columns constructed from imported borehole lithologic contact data are used as the basis to form the internal structure of the model, and the 3D model is created in the following sequence:

a) Define surfaces from linked lithology columns in chronological order from oldest to youngest (i.e., RUM, Re, Hf).

b) Build geological model volumes from oldest to youngest as sequential new deposits from the lithology contacts.

c) Leapfrog generates a new surface for each sequential lithologic entry using radial basis function

As mentioned previously, users may desire a different approach to interpolating from borehole data. This can be accomplished by applying an interpolation scheme in 2D to create a continuous surface, and then importing the grid directly in to the Leapfrog model, and transform it to a 3D surface. The disadvantage of this approach is maintaining and managing the 3D model. If model surfaces are interpolated using the proprietary Leapfrog interpolation co-radial base function scheme, then the model automatically updates if boreholes are updated. Conversely, if gridded surfaces are first created with a 3rd party program and then imported into the model, then each time there is an update to the borehole data, each surface will have to be re-created, and imported into the 3D model.

3.2 Defining Model Construction Boundaries - Topography and Basalt Surfaces, and Importing Borehole Data

The first step in creating a model is to define the topography, which represents the ground surface or top of the model and all data associated with it. The complete surface layer for this model required combining land surface topography (2008 Aero-Metric LiDAR) with the Columbia River bathymetry (PNNL-19878, *Development of a High-Resolution Bathymetry Dataset for the Columbia River Through the Hanford Reach*). This surface was created using a continuous (grid) interpolated from 0.5 m resolution LiDAR for land surface, integrated with continuous (grid) 0.2 m bathymetry data to represent the bottom surface of the Columbia River. These two grids (LiDAR & Bathymetry) were combined to create one continuous surface using a mosaic spatial analysis function in ArcMap®[2] 10.1 (ESRI 2011. ArcGIS Desktop, Release 10.1. Redlands, CA. Environmental Systems Research Institute.).

The bottom of the model is defined by the surface of the basalt bedrock that underlies the Hanford Site. The 100 Area model lower surface constraints are defined by the top of basalt. The top of basalt was originally interpolated into a 10-m grid from contours based on published interpretations of the top of basalt surface (i.e., PNNL-14753, *Groundwater Data Package for Hanford Assessments*) using the contours spatial analysis function in ArcMap® 10.0. Further refinements were made to the basalt surface using the Topo-to-Raster function in ArcMap® 10.0 which can use point data, contour data, boundary data and drain enforcement to create a hydrological correct surface with/or without sinks or drains. However, a newly revised top of basalt surface that combines the older surface with a new basalt surface data interpretation near Gable Gap and corrects the basalt surface near the southern boundary of the 100-Area model domain has been utilized in this calculation (ECF-HANFORD-16-0128, *Development of Contiguous Top of Basalt Surface for Use in Development of Site Geoframeworks*).

The next step in the modeling workflow, after the upper (topography) and lower (top of basalt surface) boundaries of the model are defined, is to construct the spatial representation of the stratigraphic unit surfaces that can be constrained within the model boundaries. Information for defining the top of each

[2] ArcMap® is a registered trademark of ESRI, Inc., Redlands, California, in the United States and other countries.

surface is maintained in IDMS and accessible through the Environmental Dashboard Application (EDA), and the Hanford geological contacts databases. The process for selecting boreholes, defining contact elevations from borehole logs, and quality assurance for borehole contacts is described in detail in *100 Area Stratigraphic Database Development* (ECF-100NPL-11-0070). The required borehole spatial location information, i.e., surface horizontal and vertical elevation coordinates, along with other optional well construction information are obtained from records maintained in IDMS (EDA).

The following steps describe the borehole data used and the essential format, and fields required to develop the Leapfrog models:

1. Import selected borehole collars containing borehole horizontal location coordinates and ground surface elevations using the “Borehole Data” folder directory in the Leapfrog project tree (abbreviated example shown in Table 2). Attachment A, Table A-1 contains the entire population of well and borehole surface information used to identify and locate the boreholes within the model.

2. Import borehole lithology data (elevations of geologic contact tops; Attachment A, Table A-2) associated with each borehole (example in Table 3, and Figure 1). This data import is a subset of the borehole collar data set imported into Table 2 and contains available subsurface geologic information that is not defined for all wells defined in the model. The 100-Area model domain is divided into three hydrogeologic units that are based on area specific geologic interpretations and publications.

    a. The three stratigraphic units are:

        i. Hanford formation (undifferentiated).

        ii. Ringold Formation unit E (also known as the Rwie, Ringold E, or Ringold unit 5).

        iii. Ringold Formation upper mud unit (also known as the RUM).

3. Import well construction information (i.e., total borehole depth, screen top and bottom information) associated with each borehole (see example in Table 4). This data import is a subset of the borehole collar data set imported into Table A-1 and contains available well construction information that is not defined for all wells defined in the model. However, screen data was not used in any aspect of model interpolation.

A snapshot of the completed Leapfrog-Geo model is termed a ‘scene' (Figure 2). Each scene is unique, composed of the top and bottom boundaries of the model as defined above, and the data inputs (pre-defined) from the tables above. Each model scene (or version) is archived as a complete model data package to support future recreation of the model. Note: Each Leapfrog-Geo scene available for use will also contain wells that were not used in the geological framework construction, but whose existence and location are of specific interest to scientists and project managers. Examples of these include decommissioned wells, aquifer tubes, and other wells that do not have information and details essential to geologic model construction.

Table 2. Example of Leapfrog Borehole Collars Table

Well Name	xcoord[a]	ycoord[a]	Elevation (m)	TD (m)	Well_id
199-B2-12	565368.44	145363.68	133.93	54.5	A4550
199-B2-14	565095.99	145232.26	134.30	46.4	C7665
199-B5-1	564878.15	144764.90	139.16	46.02	A4561
199-B5-5	564721.99	144955.49	135.42	65.47	A4562
199-B5-6	564967.70	144316.44	144.97	59.59	C7507

TD = total depth

a. Coordinates system in NAD 1983 HARN State Plane Washington South FIPS 4602

Table 3. Example of Leapfrog Borehole Lithology Table

Well Name	From (m)[a]	To (m)[b]	Lithology[c]
199-B2-12	0.0	3.0	Hanford
199-B2-12	3.0	3.8	RE Reworked
199-B2-12	3.8	45.5	Ringold E
199-B2-12	45.5	45.7	RUM Reworked
199-B2-12	45.7	54.5	RUM
199-B2-14	0.0	8.5	Hanford
199-B2-14	8.5	10.1	RE Reworked
199-B2-14	10.1	42.1	Ringold E
199-B2-14	42.1	43.8	RUM Reworked
199-B2-14	43.8	46.4	RUM

Notes:

a. Depth in meters below ground surface of the contact surface elevation.

b. Depth in meters below ground surface of the lower constraint of the contact elevation, and the beginning of the next contact elevation.

c. RE and RUM Reworked units were included in the model database but not interpolated as part of the model construction.

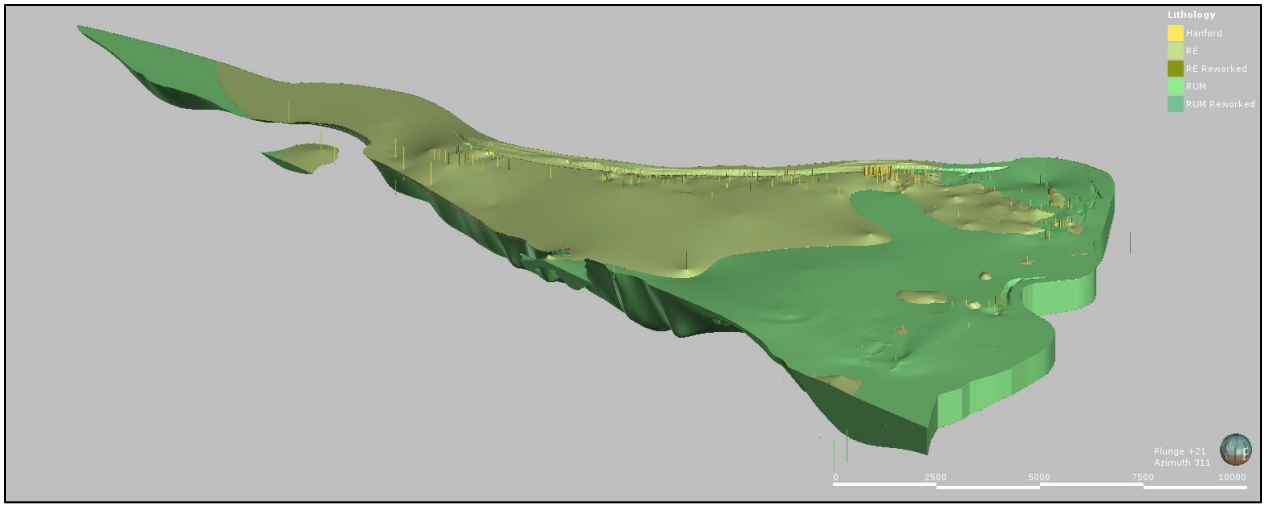

Figure 2. Three-dimensional View of the Leapfrog-Geo Model Shows Model Extent Boundaries and Borehole Locations

Table 4. Example of Leapfrog Well Screens Table

Well Name	From (m)[a]	To (m)[b]	Well type	Status	Screen type
199-B2-14	12.77	20.39	Groundwater	IN-USE	perforation
199-B2-15	48.13	51.38	Groundwater	IN-USE	screen
199-B3-1	6.1	18.29	Groundwater	IN-USE	screen
199-B3-50	21.09	27.19	Groundwater	IN-USE	screen
199-D2-10	3.01	7.58	Groundwater	IN-USE	Screen

Notes:

a. Depth in meters below ground surface of the top of open interval (screen or perforations).

b. Depth in meters below ground surface of the bottom of the open interval (screen or perforations).

3.3 Refine Geological Surfaces and Spatial Resolution

Model surfaces in the 100 Area model are refined by adding control points and/or polylines to geologic surfaces. The control point data includes x-coordinate, y-coordinate, and an elevation of the unit it represents (i.e., Hf, Rwie, RUM). The logic for placement of control points and polylines is based on an underlying understanding of the geologic framework, which is developed by professionally trained and experienced geologists, and is necessary in areas where the interpolated surface deviates from information that is not represented by borehole contacts (e.g., geologic truncations, faults, etc.). It also may be useful in areas where borehole data is sparse but well-defined structural patterns or trends are known or assumed (i.e., the 100-F-Area RUM surface trend). Control points and polylines may change as new wells are drilled or new well interpretations become available. The tables containing the control points that are associated with each scene or revision are also uploaded and archived concurrently with each model release. In addition to using control points, specific wells and/or borehole geologic intervals were omitted

from interpolation and use in the model. Wells and intervals were omitted in model areas where questionable unit contact depths, anomalous highs and anomalous lows (i.e. gaps, holes) could not be resolved by control points or polylines. These omissions are listed in Attachment B.

The 100 Area model is considered a regional model and provides geologic detail appropriate for the scale of this model. Refined models consisting of smaller extents are often required for supporting project-specific work scope in more localized areas typically defined by the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) Operable Unit boundaries. To meet the specific needs of scientists and project managers, we have created smaller models ("sub models") with greater spatial detail and higher resolution in select areas of interest within the larger boundary. To maintain model consistency and transparency, the smaller models are created by making a copy of the larger model in the same workspace and changing/trimming the model extents to cover a smaller area. Spatial detail and resolution are increased during this process. Currently smaller, project-specific models are available for the 100-K, 100-N, and 100-D/H Areas. For user access purposes, the smaller domain models are maintained with the larger models used to create them, but are not necessarily up-to-date with the current 100-Area model.

3.4 Add Feature Data

Additional feature data are added to the geological models as reference points and attributes of interest. The following feature data were added to the 100-Area Leapfrog scenes for view enhancement:

a) Groundwater Area Operable Unit boundaries

b) Waste sites boundaries

c) Well names, and color-indicators, by category, of the well information provided at that location. Information may include well screen information, geologic information, or well status, i.e., well decommissioned

d) Published 2-dimensional groundwater plume extents for all major contaminants of concern

e) Published interpretations of the water table

Additional feature data can be added to any scene at the request of project staff. The feature data sets are captured and archived with the completed scene data package.

3.5 Step-by-Step Instructions for Reproducing the 100 Area Leapfrog Solids Model

In the previous sections of the methodology, we have endeavored to provide the overall workflow and logic we employed to create our model. The section below provides the exact sequence of steps that must be followed, and the input files referred to in each step, in order for the user to construct the exact same model (*note: variation from this sequence of steps will produce a slightly different model output)*:

a) Open Leapfrog Software and create a new project

b) Import borehole data by right clicking on the folder titled "Drillhole Data" and navigating to the comma separated value (csv) table entitled "100_Area_collar_2016-20-12.csv". In the "import data dialogue box" there will also be a section to import well intervals. In this area, browse to the coma separated value table entitled "100_Area_Lithology_2016-20-12.csv".

c) Follow the prompts in the Leapfrog Borehole Data dialogue box entering the well name column from the csv file as (Hole ID), the x-coordinates column from the table as (X) data, the y-

coordinates as (Y) data, the elevation as (Z), constructed depth as (MAX DEPTH), Dip and Azimuth in the Leapfrog dialogue boxes respectively.

d) To add the upper surface of the model right click on the folder entitled "Topography", then "New Topography", then "Import Elevation Grid". Browse to the desired file, and import it. (*Note: Leapfrog will not accept the native 0.5 resolution due to the size of the file. Input 10 for the grid spacing)*

e) To add the lower surface of the model boundary and the northern clipping boundary, right click on the "Meshes" folder, and "import elevation grid", and navigate to final_tob.asc and import it.

f) To create a new geological model we define a region that encompasses the boundary coordinates of the model. Right click on the folder entitled "Geological Model", and click "New geological model". In the Base Lithology dropdown, navigate to the lithology (which should appear by default). Set the X minimum and maximum to 551,421.5 and 585,763.7 respectively, and set the Y minimum and maximum to 141,300.6 and 155,910.9 respectively. Set the Z elevations to -195.0 and 525.0 minimum and maximum respectively. Surface resolution is then set to 20, and click OK.

g) Expand the new Geological model and right click "Surface Chronology", then drop down to "New Deposit from Base Lithology." Drop down to Ringold E. Click the radio button "Contacts Below" and check the RUM. Click OK. This will add the Ringold solids model geometry to the existing model.

h) Again, right click on "Surface Chronology", but this time drop down to "New Deposit", and "From Base Lithology", and choose the Hanford, and choose the RUM and Ringold for contacts below.

i) To change the base of the model to the top of basalt, expand the geological model. Under "Boundaries", drop down to New Base, From Surface, and add the top of basalt that was previously added to the mesh (final_tob.asc).

j) To trim the Northern extent of the model boundary so it clips at the river, right click "Boundary" again, then Add New Lateral Extent, from GIS vector data, and select the “100 Area Extents 4” GIS line.

k) Surface control is added to the model with control wells included in the "Hanford South Leapfrog Collars.csv" and "Hanford South Lithology.csv" tables when imported. To add more surface control, import previously constructed polylines to the Polylines folder, then add them to the corresponding surface by right clicking on the surface and selecting “Add > Points”. Use polylines constructed for Hanford, Ringold E, and RUM. To change the base of the model to the top of basalt, expand the geological model. Under "Boundaries", drop down to New Base, From Surface, and add the top of basalt that was previously added to the mesh (final_tob.asc).

4 Assumptions and Inputs

4.1 100-Area Model Domain

The model domain is comprised of a rectangular region:

- approximately 15.0 km north-south
- approximately 35.5 km east-west

- coordinates:
    - Washington State Coordinate System: NAD_1983_StatePlane_Washington_South_FIPS_4602
    - lower left corner: Easting 550980 m, Northing 141125 m
    - upper right corner: Easting 589183 m, Northing 156327

4.1.1 Stratigraphy of the 100-Area Model

The interior of the 100-Area model domain is divided into three vertically stacked stratigraphic unit layers. The naming convention of the stratigraphic units is not consistent with the nomenclature used to define other models outside of the 100 Area domain (e.g., the Hanford South Geoframework model) because these regions were investigated following different purposes and corresponding and transecting stratigraphic correlations have not been made for the regions beyond the 100 Area.

The three stratigraphic units are, from youngest to oldest:

1) Hanford formation (undifferentiated)
2) Ringold Formation unit E (this has also been defined in publications as Rwie, Ringold unit E, or Ringold unit 5)
3) The Ringold Formation upper mud unit (also known as RUM). This informally defined unit is composed of the older undifferentiated Ringold Formation, an underlying thick sequence of silt, sand, and clay with interspersed lenses of sand and gravel comprising the Ringold Formation unit of Taylor Flat (and/or Savage Island), the lower mud unit, and unit A.

5 Software Applications

Software used for this calculation is applicable in accordance with PRC-PRO-IRM-309, *Controlled Software Management.*

5.1 Approved Software

The following software was used to perform the calculations and was approved and compliant with PRC-PRO-IRM-309. This software is managed under the following documents consistent with the procedure:

5.2 Descriptions

Required software descriptions are provided in the subsections that follow.

5.2.1 Leapfrog-Geo (Controlled Calculation Software)

- Software Title: Leapfrog-Geo
- Software Version: Version 3.0.0
- Hanford Information Systems Inventory (HISI) Identification Number: 2874 (Safety Software, graded Level C)
- Workstation type and property number (from which software is run): INTERA Laptop (non-HLAN), tag #0771

Leapfrog-Geo is controlled use software managed under the following software quality assurance documents;

- CHPRC-01753, *Leapfrog-Hydro and Leapfrog-Geo Software Management Plan*
- CHPRC-01754, *Leapfrog-Hydro and Leapfrog-Geo Software Test Plan*
- CHPRC-01755, *Leapfrog-Hydro and Leapfrog-Geo Acceptance Test Report: Leapfrog-Hydro Version 2.3.2 and Leapfrog-Geo Version 3.0.0*

5.2.2 pgAdmin PostGresSQL tools (Utility Software)

pgAdmin PostGresSQL tools were used to store and query data in a spatially-enabled relational database and perform calculations as necessary.

- Software Title: pgAdmin PostGresSQL tools
- Software Version: Version 1.16
- HISI Identification Number: (unregistered)
- Workstation type and property number (from which software is run): Dell Laptop (non-HLAN), Dell Service Tag #14610748609

5.2.3 ArcMap® (Utility Software)

ArcMap® was used for grid math and interpolations using the spatial analyst tool and 3D analyst tools.

- Software Title: ArcMap®
- Software Version: Version 10.2
- HISI Identification Number: (unregistered)
- Workstation type and property number (from which software is run): INTERA Laptop (non-HLAN), tag #00669

5.3 Statement of Valid Software Application

- Leapfrog-Geo software identified was used consistent with intended use for CHPRC as identified in CHPRC-01753 and is a valid use of this software for the problem addressed in this application. This software was used within the limitations defined in CHPRC-01753 for CHPRC applications. A copy of the *Software Installation and Checkout* form for this software is provided in Attachment B.
- Utility software was used for limited purposes to support the use of Leapfrog-Geo and this use was consistent with the purposes of these commercial, off-the-shelf software packages.

6 Results/Conclusions

The Leapfrog-Geo model is a 3D geological model. The model scenes are outputs representing the models which can be easily viewed and explored using a free Leapfrog-Geo Viewer (Leapfrog Viewer® version 4.6, ARANZ Geo Limited, LLC, 2013). The available models may be accessed (with permission) for viewing at an internal share location maintained by CHPRC; direct requests for access to the preparer of this ECF or the CHPRC Risk and Modeling Integration Manager. The Leapfrog Viewer® (version 4.0

or latest version) software can be downloaded from Hanford's Software Distribution site for HLAN users, or from the ARANZ website for external users.

The model scenes are maintained and regularly updated to remain consistent with the most recent borehole data and other relevant information. Update intervals vary depending on the availability of new information and/or project-specific requirements. New and revised model scenes are generated periodically as new borehole and site information become available. New models and revisions and the supporting data sets used in their construction are stored together in folders that are identified and linked by date (e.g., 100-Areas_2016-20-12). The model construction information and supporting data is managed, updated, and maintained via CHPRC under the Remedial Decision Support Task of the Environmental Programs and Strategic Planning Organization in CHPRC's Environmental Model Management Archive (EMMA) (CHPRC-00189, *Environmental Quality Assurance Plan*, Appendix E, "Quality Assurance Project Plan for Modeling").

The calculation results presented in Chapter 4 are evaluated with respect to the data source uncertainty. Uncertainty is not quantified in the ECF but is discussed qualitatively.

6.1 Uncertainty in Stratigraphic Surface Interpolation

The representation of the stratigraphic surface is affected by the following uncertainties:

- Uncertainties in interpreting geologic contacts
- Errors in reported depth measurements
- Method used to define control points may add bias and is subjective
- Representativeness of individual contact data points with respect to the region surrounding the data point
- Biases and variability introduced by the interpolating algorithm
- Limited number of deep geologic contact data measurements.

Developing geologic surface configurations from a limited spatial dataset also leads to uncertainty in the shape of that surface away from areas of dense well control. The kriging based interpolation routine (radial basis functions for the 3D geologic layers) was introduced to reduce this uncertainty. The issue is how far a geologic data point can be extrapolated away from the wellbore or model cell containing the wellbore. Kriging and radial basis functions have a diminishing influence with distance as defined by the exponential variogram structure. Kriging reduces but cannot eliminate uncertainty due to sparse data as it does not represent the physics of the processes that deposited the surface. It is instead an interpolation algorithm that is symmetric with respect to the measurement point. One of the reasons for using control points was to reduce the influence of this modeling limitation. Control points allow the imposition of the subjective bias by the geologist into the interpolation, their placement and the interpretation of their influence are subjective. They are mainly used to apply professional judgment where insufficient data exist to fully describe site conditions. The net effect of control points is to maintain consistency with published or interpreted geologic results.

The uncertainties listed above provide a listing of some common uncertainties encountered during any geologic investigation. These uncertainties are minimized, where possible, through accurate collection and recording of the raw data that are used to interpret the results, by utilizing consistent interpretation techniques, and maintenance/archival of the related databases and hydrogeologic publications that provide the basis for the interpretations.

7 References

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Attachment A

Well Information and Geologic Contacts Data Tables

The data contained in Tables A-1 and A-2 represent the most accurate and currently available well location and interpreted geologic contact depths available. Table A-1 presents the format used for well location and elevation information (i.e. ground surface, top of casing, brass cap, etc.) used in Leapfrog-Geo. The information in Table A-1 is the best estimate at the time of drilling and is derived from GeoContacts_100-Area_2016-20-12.xlsx. Table A-2 presents the geologic contact information derived from GeoContacts_100-Area_2016-20-12.xlsx used to generate geologic unit surfaces and interpolated volumes in the Leapfrog geologic framework model but also lists the reworked RE and RUM data. These data could not be excluded as doing so would introduce erroneous unit top elevations for RE and RUM in those particular wells. Table A-2 is formatted for use in Leapfrog Geo.

Tables A-3 and A-4 contain data for new wells added or changed in the most recent revision of the 100-Area model (100 Area 2016-20-12.aproj). These additions and revisions were made in December, 2016 to encompass wells drilled in FY 2016.

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-B2-12	565368.44	145363.68	133.93	54.5
199-B2-14	565095.99	145232.26	134.3	46.4
199-B2-15	565092.32	145230.48	134.27	59.1
199-B2-16	564915	145190.68	133.37	47.3
199-B3-2	565847.58	145326.11	135.43	240.8
199-B3-46	565899.57	145369.04	134.73	20.4
199-B3-50	566028.9	145058.21	143.02	55.9
199-B3-51	565379.25	145362.36	134.04	47.6
199-B4-8	565578.45	144653.79	144.46	27.6
199-B5-1	564878.15	144764.9	139.16	46.0
199-B5-5	564721.99	144955.49	135.42	65.5
199-B5-6	564967.7	144316.44	144.97	59.7
199-B5-8	566014	143587.69	153.93	70.3
199-B8-9	565276.43	144054.45	150.99	66.9
199-D2-10	574470.87	153465.19	120.3	9.5
199-D2-11	573328.16	151120.73	143.45	34.8
199-D2-12	574343.45	153300.01	120.57	10.4
199-D2-5	573812.3	151148.18	140.51	29.0
199-D2-6	573000.21	151119.86	143.36	33.7
199-D2-8	573263.6	151208.59	143.61	30.8
199-D3-3	572482.54	151186.96	143.2	34.8
199-D3-4	572468.16	151170.97	143.25	34.8
199-D3-5	572787.66	150994.54	144.05	34.2
199-D4-1	572752.85	151558.89	143.25	32.0
199-D4-10	572750.25	151540.44	143.44	29.8
199-D4-101	572800.1	151425.94	143.61	33.5
199-D4-11	572768.94	151554.14	143.38	29.6
199-D4-12	572771.58	151562.08	143.5	30.1
199-D4-13	572665.86	151424.47	142.94	30.8
199-D4-14	572839.81	151641.64	143.47	31.1
199-D4-15	572936.64	151424.86	143.66	32.0

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D4-16	572756.74	151555.32	143.43	31.0
199-D4-17	572738.09	151558.43	143.37	31.4
199-D4-18	572726.34	151570.93	142.98	31.1
199-D4-19	572559.35	151282.04	143.12	33.7
199-D4-2	572768.37	151543.96	143.75	31.5
199-D4-20	572794.04	151257.47	143.56	32.8
199-D4-21	572778.85	151569.8	143.65	30.2
199-D4-22	572788.45	151539.29	144.03	30.8
199-D4-23	572672.46	151592.87	140.39	26.8
199-D4-24	572699.89	151471.43	143.2	30.8
199-D4-25	572711.44	151476.24	143.51	32.3
199-D4-26	572712.33	151488.88	143.46	32.0
199-D4-27	572724.23	151493.48	143.63	32.0
199-D4-28	572725.09	151506.07	143.52	31.1
199-D4-29	572736.86	151510.69	143.81	31.1
199-D4-3	572766.08	151546.12	143.67	31.1
199-D4-30	572737.44	151523.22	143.82	30.6
199-D4-31	572749.47	151528	143.88	29.9
199-D4-32	572790.87	151573.75	143.68	30.8
199-D4-33	572792.63	151585.94	143.71	31.4
199-D4-34	572804.6	151590.03	143.58	31.7
199-D4-35	572806.31	151602.28	143.52	31.1
199-D4-36	572818.19	151606.22	143.52	31.1
199-D4-37	572820.29	151618.58	143.52	31.1
199-D4-38	572671.32	151537.86	142.81	31.1
199-D4-39	572747.45	151650.84	143.19	31.1
199-D4-4	572754.61	151571.61	143.42	32.3
199-D4-40	572832.35	151622.63	143.57	30.7
199-D4-41	572834.11	151634.66	143.48	30.8
199-D4-42	572847.13	151642.44	143.51	32.0
199-D4-43	572849.65	151656.21	143.46	31.1

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D4-44	572856.12	151665.63	143.34	31.4
199-D4-45	572868.01	151671.8	143.28	32.3
199-D4-46	572868.85	151684.94	143.17	31.7
199-D4-47	572880.48	151690.13	143.16	31.2
199-D4-48	572881.3	151703.46	143	32.9
199-D4-49	572699.12	151458.69	143.24	30.5
199-D4-5	572740.54	151556.5	143.31	30.8
199-D4-50	572687.3	151454.01	143.12	29.9
199-D4-51	572686.61	151441.4	143.15	30.4
199-D4-52	572674.91	151436.73	143.17	30.4
199-D4-53	572674.1	151424.63	143.14	29.7
199-D4-54	572662.43	151419.73	143.17	30.4
199-D4-55	572659.03	151414.64	143.19	30.3
199-D4-56	572657.66	151402.28	143.1	29.7
199-D4-57	572645.94	151397.86	143.16	30.9
199-D4-58	572644.81	151385.35	143.34	32.5
199-D4-59	572633.32	151380.82	143.22	31.2
199-D4-6	572733.34	151577.92	143.28	30.8
199-D4-60	572632.37	151368.26	143.18	31.8
199-D4-61	572620.66	151363.7	143.1	32.1
199-D4-62	572619.52	151351.07	143.19	33.4
199-D4-63	572607.64	151346.84	143.29	33.9
199-D4-64	572606.95	151333.91	143.32	33.8
199-D4-65	572594.77	151329.74	143.32	34.1
199-D4-66	572594.28	151316.86	143.33	34.7
199-D4-67	572581.86	151312.78	143.28	34.8
199-D4-68	572581.32	151299.84	143.07	35.1
199-D4-69	572569	151295.69	143.08	34.5
199-D4-7	572760.87	151551.25	143.36	29.3
199-D4-70	572568.79	151282.68	143.13	34.7
199-D4-71	572556.29	151278.5	143.12	34.7

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D4-72	572554.43	151265.78	143	34.8
199-D4-73	572542.17	151262.72	143.15	35.0
199-D4-74	572539.8	151249.8	142.9	35.0
199-D4-75	572527.76	151246.95	143.07	35.4
199-D4-76	572526.06	151234.24	142.97	35.3
199-D4-77	572513.33	151231.01	142.93	34.8
199-D4-78	572511.28	151218.26	142.98	34.4
199-D4-79	572498.24	151214.02	143.63	35.1
199-D4-8	572763.3	151552.65	143.34	30.2
199-D4-80	572496.87	151202.59	143.43	34.4
199-D4-81	572484.36	151199.64	143.33	34.4
199-D4-82	572470.26	151183.89	143.23	35.1
199-D4-83	572859.43	151723.42	142.89	29.9
199-D4-84	572568.04	151433.52	143.63	31.6
199-D4-85	572486.16	151324.2	143.31	35.1
199-D4-86	572389.06	151202.14	142.6	34.3
199-D4-87	572757.05	151550.04	143.44	30.6
199-D4-88	572758.67	151553.22	143.4	29.9
199-D4-89	572759.62	151547.12	143.53	29.1
199-D4-9	572758.2	151543.32	143.6	29.7
199-D4-90	572823.2	151616.13	143.45	30.9
199-D4-91	572817.65	151621.08	143.45	30.9
199-D4-92	572714.05	151486.31	143.52	32.5
199-D4-93	572710.39	151491.2	143.33	32.1
199-D4-94	572712.89	151496.05	143.33	31.3
199-D4-95	572612.82	151226.7	143.37	37.0
199-D4-96	572777.03	151519.78	144.2	32.5
199-D4-97	572906.23	151625.33	143.87	33.5
199-D4-98	572574.52	151481.65	143.1	33.8
199-D4-99	572527.36	151377.08	143.2	35.4
199-D5-101	572943.04	151521.52	143.83	34.8

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D5-102	573428.15	151340.23	143.81	34.6
199-D5-103	573505.87	151460.87	143.61	35.7
199-D5-104	573265.48	151422.43	144.05	35.4
199-D5-106	573503.74	151597.97	143.67	32.7
199-D5-107	572932.37	151283.14	144.09	31.7
199-D5-108	572923.34	151222.9	144.38	32.3
199-D5-109	572917.37	151285.57	144.02	32.7
199-D5-110	572931.57	151277.61	144.12	31.2
199-D5-111	572943.24	151281.47	144.11	31.0
199-D5-112	572929.08	151289.87	143.99	35.1
199-D5-113	572927.02	151288.45	143.99	31.1
199-D5-114	572918.04	151223.75	144.36	31.8
199-D5-115	572923.15	151221.12	144.39	32.0
199-D5-116	572926.93	151222.35	144.42	31.9
199-D5-117	572922.94	151225.43	144.39	27.9
199-D5-118	572921.03	151224.45	144.37	31.9
199-D5-12	573839.62	151557.2	143.74	27.7
199-D5-120	573377.18	151406.84	143.66	34.3
199-D5-121	573430.24	151399.27	143.77	34.1
199-D5-122	573300.25	151349.29	143.67	34.2
199-D5-123	573824.21	151639.41	144.17	37.7
199-D5-125	573667.39	151746.18	143.99	34.1
199-D5-126	573705.71	151843.28	143.63	34.8
199-D5-127	572992.26	151428.31	143.83	33.2
199-D5-128	573622.4	151237.35	143.15	32.5
199-D5-129	573735.5	151465.13	143.34	34.6
199-D5-13	573535.53	151955.18	143.65	29.7
199-D5-130	574039.2	151928.51	142.4	30.9
199-D5-131	573684.39	152006.75	143.75	35.5
199-D5-132	573875.35	151586.87	144.36	34.1
199-D5-133	573731.55	151497.37	143.44	34.1

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D5-134	573675.32	151862.46	143.68	82.3
199-D5-14	573789.63	151787.99	143.85	30.8
199-D5-140	573750.68	151778.82	143.95	34.4
199-D5-141	573243.43	151424.51	144.21	96.5
199-D5-142	573791.87	151563.26	143.16	27.4
199-D5-143	573701.53	151784.26	143.71	36.0
199-D5-144	573352.03	151404.83	143.77	35.2
199-D5-145	573215.53	151396.22	144.21	36.2
199-D5-146	573219.75	151345.63	144.04	35.6
199-D5-147	572993.32	151380.77	143.85	33.0
199-D5-148	573361.55	151083.22	143.02	35.1
199-D5-15	573738.61	151673.75	143.9	31.0
199-D5-153	573329.77	151992.82	142.6	33.2
199-D5-154	573632.26	151831.74	143.2	35.0
199-D5-16	573917.45	151652.51	144.45	29.9
199-D5-17	573730.52	151322.83	143.26	35.1
199-D5-18	573861.7	151325.18	142.58	30.6
199-D5-19	573849.12	151243.19	141.99	30.0
199-D5-20	573239.97	152030.15	142.97	31.5
199-D5-32	573372.04	151903.39	143.14	32.2
199-D5-33	573095.03	151714.54	143.41	31.8
199-D5-34	573240.42	151554.12	144.52	32.8
199-D5-36	572909.82	151746.32	143.12	31.4
199-D5-37	573092.24	151916.37	143.07	30.3
199-D5-38	572996.82	151545.59	143.96	33.5
199-D5-39	573142.86	151428.43	143.98	32.9
199-D5-40	573003.26	151272.02	143.98	33.4
199-D5-41	573358.16	151792.19	143.43	33.4
199-D5-42	573479.77	151622.67	143.85	33.4
199-D5-43	573179.98	151269.43	143.84	34.3
199-D5-44	572993.58	151835.74	142.66	30.5

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D5-92	573131.93	152009.82	142.48	30.2
199-D5-93	573350.22	151459.64	143.61	33.2
199-D5-97	573250.11	151302.47	143.72	34.6
199-D5-98	573369.56	151272.44	142.97	34.6
199-D5-99	573349.61	151402.01	143.99	35.1
199-D6-1	574129.87	151691.71	144.22	32.6
199-D6-2	574544.61	151970.2	133.72	24.5
199-D6-3	574159.09	151643.85	143.93	33.7
199-D7-3	574151.38	152363.41	135.38	27.2
199-D7-4	574377.07	152369.64	133.76	23.6
199-D7-5	574434.31	152678.72	131.43	19.4
199-D7-6	574429.2	152980.43	125.01	13.4
199-D8-4	573447.19	152090.21	143.22	32.7
199-D8-5	573537.15	152243.5	138.17	26.6
199-D8-53	573889.86	152452.26	132.89	21.2
199-D8-54A	573781.17	152408.03	134.93	23.8
199-D8-54B	573768.24	152398.65	134.92	43.9
199-D8-55	573620.95	152364.35	135.6	23.2
199-D8-68	573711.67	152427.1	134.82	24.4
199-D8-69	573843.61	152552.2	130.53	18.9
199-D8-70	573942.1	152508.74	131.95	22.6
199-D8-71	573837.1	152429.39	133.72	24.7
199-D8-72	573570.48	152211.77	140.75	29.0
199-D8-73	573388.7	152167.38	141.79	28.2
199-D8-88	573292.33	152141.26	141.1	29.8
199-D8-89	573478.64	152249.65	138.09	25.9
199-D8-90	573948.64	152646.23	125.96	17.2
199-D8-91	574036.89	152741.44	123.74	14.2
199-D8-93	574148.7	153085.8	120.4	6.4
199-D8-94	574047.82	152949.53	120.29	9.5
199-D8-95	573611.96	152160.61	141.81	31.8

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D8-96	573706	152152.24	140.48	30.9
199-D8-97	573859.56	152087.42	140.85	31.8
199-D8-98	574013.12	152123.02	138.03	27.9
199-D8-99	574006.77	152364.37	136.54	27.1
199-F2-3	580496.17	148497.77	121.84	14.6
199-F5-1	581250.12	147736.87	124.27	21.4
199-F5-2	581076.25	147799.51	126.47	30.5
199-F5-3	581176.98	147754.02	125.13	28.4
199-F5-4	580583.19	147533.73	126.47	35.1
199-F5-43A	581183.87	147948.07	120.61	15.2
199-F5-43B	581170.92	147960.38	120.43	57.9
199-F5-45	580706.88	147683.92	126.37	16.0
199-F5-46	580841.34	147781.51	127.19	17.4
199-F5-47	580495.51	147508.45	127.84	19.4
199-F5-48	580517.58	147690.1	127.29	16.8
199-F5-5	580971.34	147935.07	125.88	30.5
199-F5-52	580672.81	148143.82	127.62	22.5
199-F5-53	580978.54	148042.48	125.11	35.4
199-F5-54	581145.51	147576.44	126.62	23.6
199-F5-6	580901.65	148041.99	126.55	58.5
199-F6-1	581375.87	147564.51	123.6	17.2
199-F7-1	579687.17	147022.43	119.35	45.7
199-F7-3	579884.71	147112.53	120.49	10.1
199-F8-1	580335.26	147430.48	124.06	17.4
199-F8-2	580373.89	147468.47	125.45	17.8
199-F8-3	580253.99	147253.37	121.95	11.4
199-F8-4	580958.51	147123.53	125.37	15.5
199-F8-7	580242.91	147116.74	123.17	11.7
199-H1-1	576702.31	153384.49	123.52	12.5
199-H1-2	576451.07	153378.26	128.13	16.6
199-H1-20	575706.04	154183.61	121.11	17.6

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-H1-21	575896.84	154163.8	121.38	12.1
199-H1-25	576279.64	154069.97	122.96	13.0
199-H1-27	576403.86	154024.21	123.57	12.6
199-H1-3	576163.04	153372.22	128.56	14.8
199-H1-32	576767.07	153766	127.46	16.7
199-H1-33	576833.29	153716.23	126.09	13.7
199-H1-34	576883.13	153667.06	125.36	14.7
199-H1-35	576958.26	153628.14	125.57	15.6
199-H1-36	576885.62	153486.51	125.46	14.2
199-H1-37	577106.92	153641.63	126.05	14.1
199-H1-38	577161	153555.01	126.24	14.5
199-H1-39	577223.54	153533.4	125.57	13.4
199-H1-4	575826.78	153366.87	127.88	14.8
199-H1-40	577279.34	153500.19	125.95	13.5
199-H1-42	577127.18	153391.65	124.62	13.4
199-H1-43	577213.74	153384.28	125.35	14.9
199-H1-45	577240.96	153062.41	127.9	18.6
199-H1-5	574850.72	153090.3	123.99	14.2
199-H1-6	576037.81	153745.74	125.44	14.3
199-H1-7	577629.6	153172.1	124.8	11.3
199-H2-1	577752.31	153239.89	123.35	57.6
199-H3-1	577645.04	152437.94	129.13	22.9
199-H3-10	577545.14	152723.52	128.25	70.4
199-H3-25	577410.36	152978.49	127.79	18.7
199-H3-26	577440.83	152846.5	127.3	17.2
199-H3-27	577567.05	152811.14	128.36	18.9
199-H3-2A	577624.61	152750.07	128.05	17.1
199-H3-2B	577628.27	152757.16	128.01	17.7
199-H3-2C	577632.07	152750.3	128.02	47.2
199-H3-3	577562.09	152363.17	128.05	16.3
199-H3-4	577544.29	152293.21	126.46	14.9

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-H3-5	577454.7	152287.5	126.29	15.2
199-H3-6	578266.47	152425.33	128.53	18.8
199-H3-7	577931.74	152279.97	129.07	18.0
199-H3-9	578039.12	152913.6	126.36	66.5
199-H4-1	578148.51	152657.65	128.48	23.9
199-H4-10	577827.21	153155.81	123.7	13.6
199-H4-11	578141.91	152728.43	127.68	20.0
199-H4-12A	578009.15	152912.73	126.47	16.6
199-H4-12B	578004.39	152918.47	126.46	15.6
199-H4-12C	578011.77	152919.81	126.34	67.1
199-H4-13	578219.3	152595.27	127.98	19.6
199-H4-14	577803.75	152752.36	128.61	19.0
199-H4-15A	577904.31	153053.42	124.63	15.0
199-H4-15B	577899.6	153059.55	124.54	13.4
199-H4-15C	577907.68	153059.98	124.64	101.6
199-H4-16	577981.91	152591.57	129.82	19.6
199-H4-17	577779.18	153037.64	128.34	14.7
199-H4-18	578018.29	152756.48	129.1	15.5
199-H4-2	578093.55	152501.48	128.21	118.7
199-H4-3	577940.49	152858.54	128.48	17.6
199-H4-46	577883.86	152439.87	129.38	18.8
199-H4-48	577792.66	152620.21	129.97	19.9
199-H4-49	577713.83	152445.15	129.62	19.3
199-H4-5	577944.94	152939.78	127.33	19.3
199-H4-63	578185.83	152665.53	127.6	19.5
199-H4-64	577946.11	153010.58	125.29	17.2
199-H4-65	577998.26	152787.29	128.82	17.2
199-H4-69	578014.05	152686.66	129.39	19.5
199-H4-7	577804.13	152890.85	128.76	17.8
199-H4-70	578003.82	152646.45	129.6	18.7
199-H4-71	578010.64	152581.53	129.78	21.6

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-H4-72	578036.28	152500.14	128.39	18.7
199-H4-73	577940.58	152369.98	129.31	21.6
199-H4-74	577239.07	152268.83	125.36	14.0
199-H4-75	577212.36	152704.64	128.54	18.0
199-H4-76	576787.32	152976.85	129.66	18.2
199-H4-77	576487.79	152975.43	127.89	15.5
199-H4-78	576168.23	152166.12	129.54	19.5
199-H4-79	575659.13	151989.31	131.3	19.8
199-H4-8	577860.69	152921.7	128.6	17.8
199-H4-80	575238.97	152568.16	129.34	22.7
199-H4-81	575236.93	153035.36	124.79	13.5
199-H4-82	574906.99	152677.72	129.6	18.0
199-H4-85	577980.04	152880.67	128.03	16.0
199-H4-86	577705.05	152736.21	129.1	21.2
199-H4-9	577923.19	152893.89	128.28	16.5
199-H4-90	577922.94	152592.59	130.02	29.7
199-H4-91	578126.58	152524.1	128.22	29.8
199-H5-1A	577650.08	152257.72	128.17	18.4
199-H6-2	577886.5	152194.11	129.02	18.5
199-H6-3	578340.4	151929.35	128.4	21.5
199-H6-4	577771.59	151737.1	127.46	19.2
199-K-10	568912.76	146628.1	142.63	52.1
199-K-106A	568697.4	146502.39	142.55	57.9
199-K-107A	568579.94	146468.81	142.63	29.0
199-K-108A	568687.2	146396.14	142.77	28.5
199-K-109A	569122.18	146748.5	142.81	50.6
199-K-11	568938	146617.76	142.71	51.8
199-K-110A	569230.01	146677.91	142.97	28.4
199-K-111A	569308.17	146968.88	140.97	56.4
199-K-112A	570278.6	148503.44	126.49	16.5
199-K-113A	570098.07	148294.45	125.94	14.6

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-K-114A	570020.3	148280.55	125.73	15.5
199-K-115A	569939.99	148135.42	126.58	18.6
199-K-116A	569871.15	147960.5	129.94	28.2
199-K-117A	569702.56	147976.98	127.08	22.3
199-K-118A	569703.06	147865.9	130.06	24.7
199-K-119A	569661.8	147649.69	132.57	28.0
199-K-120A	569399.62	147518.48	125.21	30.8
199-K-121A	570017.17	147418.26	142.15	30.1
199-K-122A	569975.07	147172.86	142.43	30.8
199-K-123A	569931.1	147090.24	142.84	29.9
199-K-124A	569867.94	146991.67	143.02	30.8
199-K-125A	569712.87	147866.01	130.17	23.8
199-K-126	570574.73	148509.65	139.73	27.4
199-K-127	569539.23	147539	132.17	31.4
199-K-128	570009.54	147257.52	143.6	30.9
199-K-129	570283.65	148503.07	126.59	15.1
199-K-130	570478.99	148661.18	133.66	24.1
199-K-131	570662	148903.85	134.41	30.3
199-K-132	568495.12	146670.82	135.96	26.8
199-K-133	570560.09	148536.26	139.54	30.2
199-K-134	570600.09	148525.3	140.17	30.2
199-K-135	570589.3	148484.1	140.09	35.8
199-K-136	570549.02	148494.98	139.74	31.7
199-K-137	568653.37	146374.51	142.4	32.9
199-K-138	568395.22	146616.64	134.22	29.9
199-K-139	568551.39	146518.39	142.81	50.6
199-K-140	568493.07	146493.66	142.56	32.9
199-K-141	569024.22	146818.49	141.57	34.7
199-K-142	569104.26	146870.94	141.79	35.3
199-K-143	570934.41	148088.28	135.74	29.0
199-K-144	569163.34	147265.96	126.4	32.6

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-K-145	569284.6	147425.66	125.51	37.7
199-K-146	570197.6	148379.78	128.42	17.7
199-K-147	570411.64	148558.07	135.07	25.6
199-K-148	570584.74	148767.86	138.12	33.2
199-K-149	570778.25	148970.74	139.98	34.5
199-K-150	570787.67	149051.93	139.38	35.8
199-K-151	570941.32	148686.44	139.81	36.2
199-K-152	570736.25	148585.89	140.25	36.2
199-K-153	570530.04	148210.08	137.41	31.9
199-K-154	570321.06	148027.01	137.2	32.9
199-K-156	569674.01	147270.91	140.48	52.5
199-K-157	569432.18	147167.94	138.84	43.7
199-K-158	568627.45	146164.41	145.5	35.2
199-K-159	570911.73	149159.61	138.95	35.7
199-K-160	570919.58	149116.02	139.22	36.0
199-K-161	570004.64	148202.3	126.48	17.2
199-K-162	569340	147459.97	125.42	40.7
199-K-163	570230.66	147947.93	137.95	34.7
199-K-164	571202.22	148903.74	140.64	36.3
199-K-165	568674.96	146342.42	145.46	54.9
199-K-166	568594.56	146342.97	144.54	52.0
199-K-168	568544.37	146513.63	142.59	50.8
199-K-169	569988.97	147554.98	141.86	43.3
199-K-170	570009.01	147491.37	142.03	46.0
199-K-171	570544.03	147187.86	144.22	46.8
199-K-172	570871.69	147166.37	144.26	42.7
199-K-173	568674.07	146266.88	145.63	55.2
199-K-174	568915.38	146222.47	148.19	40.4
199-K-175	568882.72	146008.84	153.25	45.3
199-K-178	568963.01	146954.43	136.4	40.7
199-K-179	569847.25	147481.92	140.24	44.5

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-K-180	571116.08	147449.14	146.98	48.2
199-K-181	568849.75	146892.82	135.98	41.5
199-K-182	571185.32	148350.24	142.45	38.7
199-K-183	568302.28	146439.7	140.33	46.5
199-K-184	568618.68	146366.32	142.84	65.9
199-K-185	568574.92	146726.17	134.62	42.2
199-K-186	569209.65	146625.36	145.45	50.9
199-K-187	569499	146054.68	155.38	61.7
199-K-188	569386.8	146370.11	151.07	71.6
199-K-189	569150.27	146809.68	142.23	48.5
199-K-190	568835.28	146873.27	135.39	42.1
199-K-191	569711.2	146886.65	143.86	48.2
199-K-192	569393.17	147294.32	134.06	58.8
199-K-193	570641.99	146969.58	144.88	50.6
199-K-194	571315.65	147281.98	146.48	44.9
199-K-195	568850.08	146086.38	146.87	70.3
199-K-196	568433.3	146639.26	133.96	42.6
199-K-197	569348.77	147528.77	125.14	33.0
199-K-198	569304.19	147551.86	123.93	30.9
199-K-199	569339.76	147585.3	124.94	31.4
199-K-200	569426.14	147253.55	135.91	18.1
199-K-201	570092.13	148069.13	133.36	18.4
199-K-202	569101.45	146792.64	142.26	48.8
199-K-205	568845.67	146090.86	148.03	56.7
199-K-206	568734.33	146049.54	150.21	55.8
199-K-21	569769.9	147932.06	129.07	15.2
199-K-22	570023.7	148097.38	129.55	15.2
199-K-27	569155.96	146763.8	142.6	27.4
199-K-29	569205.08	146790.13	142.52	27.4
199-K-30	569238.12	146780.96	142.34	27.4
199-K-32A	569024.15	147006.68	135.47	21.0

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-K-32B	569012.4	147004.81	135.84	53.6
199-K-34	568605.78	146501.94	142.75	27.6
199-K-35	568832.33	146110.68	150.84	35.7
199-K-36	569373.61	146390.47	150.79	30.1
199-K-37	570216.2	148226.54	134.76	21.1
199-N-103A	571424.79	149903.68	140.32	32.0
199-N-104A	571778.32	149542.63	141.34	27.9
199-N-105A	571602.3	150024.96	139.62	29.9
199-N-106A	571737.6	150150.85	144.63	36.9
199-N-107A	571544.51	149812.5	141.26	23.2
199-N-121	571368.29	149973.29	122.38	13.0
199-N-122	571318.48	149928.81	122.33	14.6
199-N-123	571282.86	149889.37	123.1	16.5
199-N-136	571337.18	149940.73	122.06	7.9
199-N-137	571344.43	149946.3	122	7.9
199-N-142	571310.19	149916.16	122.2	7.8
199-N-143	571316.5	149923.04	122.26	7.9
199-N-144	571322.83	149929.28	122.25	7.8
199-N-145	571329.9	149935.11	122.08	7.9
199-N-160	571333.43	149938.01	122.08	7.9
199-N-161	571326.49	149932.43	122.13	7.7
199-N-162	571319.68	149926.6	122.24	7.9
199-N-163	571313.28	149919.73	122.22	7.9
199-N-164	571307.1	149913.06	122.18	7.7
199-N-167	571296.75	149698.29	140.7	25.3
199-N-169	571293.97	149705.43	140.76	25.3
199-N-170	571288.51	149714.84	140.79	25.5
199-N-171	571296.7	149740.08	140.96	25.6
199-N-172	571263.29	149738.54	140.56	25.0
199-N-173	571193.02	149759.67	123.46	13.8
199-N-174	571346.8	149955.26	122.07	6.3

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-N-176	571349.19	149953.27	121.96	5.7
199-N-177	571350.43	149952.38	121.91	5.6
199-N-178	571348.7	149957.63	122.07	5.7
199-N-180	571350.93	149955.69	122	5.7
199-N-181	571352.33	149954.77	121.95	5.9
199-N-182	571428.71	149819.87	140.52	46.9
199-N-183	571269.69	149756.01	140.24	35.8
199-N-184	571430.74	149817.82	140.53	32.9
199-N-185	571546.33	150237.98	122.07	28.2
199-N-186	571480.87	149715.06	141.39	29.7
199-N-187	571565.9	149897.96	141.25	28.8
199-N-188	571906.94	149581.53	139.31	27.4
199-N-189	571431.65	148430.52	143.64	35.8
199-N-2	571476.21	149859.43	140.55	38.1
199-N-200	571196.16	149755.44	123.44	5.5
199-N-203	571203.02	149767.48	123.5	8.3
199-N-205	571207.17	149775.6	123.44	8.0
199-N-206	571209.39	149779.37	123.38	5.4
199-N-207	571211.6	149783.59	123.37	8.2
199-N-208	571213.76	149787.7	123.42	4.9
199-N-209	571216.09	149791.71	123.44	8.1
199-N-210	571218.71	149795.42	123.46	5.0
199-N-211	571221.25	149799.02	123.47	8.0
199-N-212	571224.12	149802.66	123.44	4.9
199-N-213	571226.78	149806.3	123.4	8.0
199-N-214	571229.81	149810	123.32	4.9
199-N-215	571232.72	149813.53	123.25	8.3
199-N-216	571235.59	149816.81	123.23	5.0
199-N-217	571238.81	149820.18	123.14	8.1
199-N-220	571246.49	149831.5	123.23	8.1
199-N-221	571249.33	149835.26	123.3	8.2

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-N-222	571251.35	149838.48	123.13	5.3
199-N-223	571254.31	149843.04	123.17	8.1
199-N-224	571256.67	149846.41	123.26	5.3
199-N-225	571259.52	149850.47	123.4	8.2
199-N-227	571265.41	149857.51	123.31	8.4
199-N-228	571268.42	149861.28	123.23	4.9
199-N-231	571276.71	149871.81	123.09	8.0
199-N-232	571279.71	149875.71	123.07	5.0
199-N-234	571286.72	149883.1	123.21	5.1
199-N-235	571348.34	149950.76	121.94	4.9
199-N-236	571351.12	149954.54	121.97	8.1
199-N-238	571356.49	149961.94	122.12	8.1
199-N-239	571359.23	149965.75	122.17	5.2
199-N-241	571364.35	149973.32	122.25	5.0
199-N-242	571366.89	149976.8	122.24	7.5
199-N-243	571369.96	149979.88	122.28	5.2
199-N-244	571373.09	149982.83	122.28	8.0
199-N-245	571376.2	149986.82	122.27	5.3
199-N-246	571378.88	149990.56	122.28	8.2
199-N-247	571381.44	149994.14	122.26	5.5
199-N-248	571383.91	149997.93	122.22	8.2
199-N-249	571386.39	150001.56	122.17	5.2
199-N-250	571388.88	150005.61	122.14	8.2
199-N-251	571391.89	150009.72	122.11	5.2
199-N-252	571394.1	150013.22	122.08	8.1
199-N-254	571398.85	150020.79	121.93	8.1
199-N-255	571401.31	150024.75	121.9	5.2
199-N-256	571403.79	150028.61	121.84	8.3
199-N-262	571418.51	150051.2	121.88	8.0
199-N-263	571421.17	150055.46	121.88	5.4
199-N-264	571423.59	150058.79	121.86	8.1

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-N-266	571428.76	150067.07	121.87	8.2
199-N-267	571430.86	150070.66	121.86	5.2
199-N-268	571433.49	150074.61	121.87	8.2
199-N-273	571444.62	150093.65	121.93	5.4
199-N-275	571448.69	150102.9	121.95	5.3
199-N-276	571450.74	150106.59	121.93	8.0
199-N-277	571452.44	150110.78	121.83	5.5
199-N-278	571454.09	150114.44	121.76	8.1
199-N-279	571455.71	150118.57	121.73	5.4
199-N-280	571457.93	150122.77	121.69	8.2
199-N-281	571459.57	150127.35	121.66	5.5
199-N-282	571461.92	150131.39	121.67	8.2
199-N-283	571463.5	150135.71	121.62	5.4
199-N-284	571465.56	150139.88	121.61	7.9
199-N-285	571467.37	150144.43	121.65	5.4
199-N-286	571468.84	150148.69	121.68	8.4
199-N-287	571471.23	150152.3	121.65	5.4
199-N-288	571474	150155.5	121.67	8.3
199-N-289	571477.45	150158.86	121.74	5.2
199-N-290	571480.72	150161.93	121.79	8.4
199-N-292	571488.12	150167.75	121.81	8.4
199-N-293	571491.86	150170.59	121.8	5.4
199-N-294	571495.07	150173.69	121.86	8.3
199-N-295	571498.31	150176.51	121.92	5.5
199-N-296	571501.58	150179.51	121.93	8.3
199-N-297	571504.78	150182.74	121.95	5.5
199-N-298	571508.01	150186.18	121.97	8.4
199-N-299	571510.99	150189.41	121.97	5.5
199-N-300	571513.92	150192.87	121.96	8.3
199-N-303	571523.14	150203.35	122	5.2
199-N-304	571525.91	150206.87	121.98	8.5

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-N-305	571528.71	150210.59	121.99	5.5
199-N-306	571531.65	150214.05	121.95	8.4
199-N-307	571534.33	150217.5	121.95	8.4
199-N-308	571537.23	150221.22	121.97	8.2
199-N-309	571540.07	150224.73	122	5.4
199-N-310	571542.79	150228.42	121.99	8.4
199-N-311	571545.55	150232.11	121.94	5.4
199-N-312	571548.23	150235.72	121.89	8.5
199-N-313	571550.79	150239.58	121.85	5.2
199-N-314	571553.28	150243.43	121.87	8.2
199-N-315	571555.86	150247.53	121.89	5.3
199-N-318	571563.67	150258.74	121.88	8.2
199-N-319	571565.85	150262.58	121.88	5.2
199-N-320	571568.1	150266.48	121.88	8.3
199-N-321	571570.4	150270.14	121.91	5.5
199-N-322	571572.74	150274.27	121.91	8.1
199-N-323	571575.33	150278.17	122.02	5.2
199-N-324	571577.87	150282.5	122.08	8.2
199-N-326	571582.32	150290.34	122.09	8.1
199-N-327	571584.19	150294.19	122.09	5.5
199-N-328	571586.19	150298.36	122.1	7.9
199-N-329	571588.52	150302.33	122.12	5.1
199-N-330	571590.64	150306.15	122.09	7.9
199-N-331	571593.06	150310.12	122.09	5.7
199-N-332	571595.38	150314.3	122.14	8.0
199-N-333	571597.44	150318.21	122.16	5.3
199-N-334	571600.32	150322.03	122.15	8.0
199-N-335	571602.71	150325.46	122.13	5.3
199-N-336	571605.78	150329.36	122.14	8.2
199-N-337	571608.87	150333.1	122.13	5.3
199-N-338	571611.93	150336.26	122.1	8.2

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-N-340	571618.11	150342.67	122.08	7.9
199-N-341	571621.34	150346.38	122.15	5.2
199-N-342	571623.93	150349.47	122.2	8.7
199-N-343	571627.19	150353.33	122.25	5.3
199-N-344	571629.88	150356.82	122.27	8.4
199-N-345	571632.62	150360.44	122.21	5.5
199-N-346	571203.32	149780.23	123.61	8.2
199-N-347	571231.25	149822.23	123.13	8.2
199-N-348	571248.28	149845.23	123.19	8.1
199-N-349	571267.16	149866.13	123.17	8.1
199-N-350	571356.74	149966.26	122.16	8.2
199-N-351	571373.17	149987.11	122.3	8.2
199-N-352	571388.72	150009.03	122.18	8.2
199-N-353	571403.29	150031.62	121.92	8.1
199-N-354	571418.57	150055.09	121.93	8.2
199-N-355	571431.65	150077	121.96	8.1
199-N-357	571456.35	150125.44	121.83	8.2
199-N-358	571466.28	150148.67	121.73	8.1
199-N-359	571484.18	150168.77	121.93	8.2
199-N-360	571504.04	150186.94	122.09	8.1
199-N-361	571522	150206.98	122.08	8.2
199-N-362	571538.55	150228.08	122.11	8.3
199-N-363	571554.65	150249.9	121.99	8.2
199-N-364	571569.71	150273.49	121.91	8.1
199-N-366	571594.87	150317.84	122.17	7.8
199-N-367	571611.38	150340.41	122.21	8.3
199-N-41	572182.24	149965.26	139.9	23.8
199-N-43	572366.18	150139.95	137.13	23.8
199-N-5	571405.7	149675.17	139.37	38.1
199-N-50	572090.9	150298.79	141.75	26.2
199-N-52	572302.91	149466.18	141.9	23.2

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-N-54	571363.82	149633.66	139.77	22.3
199-N-57	571413.17	149542.05	140.06	23.2
199-N-61	571355.9	149156.7	141.3	20.6
199-N-62	571725.63	149483.06	141.82	23.9
199-N-66	571636.85	149684.09	142.42	24.4
199-N-69	571483.89	149804.8	140.61	31.7
199-N-70	572042.02	149877.99	138.91	31.8
199-N-71	571588.82	148982.17	141.23	26.5
199-N-75	571523.58	150060.72	139.33	27.3
199-N-77	571309.79	149243.05	139.94	31.4
199-N-80	571477.58	149950.85	139.61	38.3
199-N-8P	571326.89	149924.18	124.46	30.5
199-N-91A	571730	150500	122.55	18.0
199-N-92A	571647.42	150383.53	122.1	14.6
199-N-93A	571560	150260	120.79	13.1
199-N-94A	571466.08	150154.17	121.6	12.1
199-N-95A	571360	149970	121.61	14.9
199-N-96A	571213.48	149800.76	123.64	21.6
199-N-97A	571140	149650	120.85	19.3
699-100-43B	576675.9	154008.65	122.18	10.7
699-101-45	576032.4	154124.17	121.81	9.4
699-52-17	584666.38	139410.47	122.23	115.8
699-52-18A	584261.77	139367.27	125.49	27.4
699-52-18C	584270.8	139299.94	125.42	32.6
699-54-18C	584471.52	139998.62	123.56	108.2
699-54-18E	584297.38	139984.52	121.22	27.4
699-57-16	584953.5	140807.61	117.29	12.5
699-57-25B	582109.41	140801.46	126.79	24.7
699-57-29B	581138.33	140903.96	127.27	26.7
699-60-32	580115.08	141901.98	129.67	25.9
699-60-57	572623.5	141870.33	143.44	47.2

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
699-60-60	571588.58	141763.91	156.36	39.0
699-61-26A	581874.92	142104.96	125.12	110.6
699-61-41	577344.58	142188.41	130.82	15.9
699-62-31	580302.6	142532.47	132.42	25.6
699-62-43A	576809.57	142363.94	132.2	23.8
699-62-43F	576858.07	142481.14	129.31	24.7
699-63-25A	582315.48	142798	121.23	33.5
699-63-51	574446.76	142553.67	129.48	11.0
699-63-55	573094.39	142562.32	130.19	38.1
699-63-58	572262.69	142583.07	150.1	40.5
699-63-89	562902.06	142576.97	156.24	67.1
699-63-90	562367.22	142612.35	156.28	77.1
699-64-27	581375.46	142946.08	127.04	25.6
699-65-50	574590.79	143187.85	142.57	178.3
699-66-23	582864.76	143617.19	119.03	30.5
699-66-38	578294.02	143607.67	133.3	45.7
699-66-39	577847.18	143636.31	138.47	27.4
699-67-51	574178.93	143933.22	160.21	76.2
699-67-86	563661.65	143873.05	144.47	142.3
699-69-45	576157.41	144556.31	148.66	91.4
699-71-30	580603.35	145226.91	122.67	45.7
699-71-52	573907.9	145214.84	159.94	64.0
699-71-77	566401.95	145098.61	144.23	91.4
699-72-73	567551.54	145418.78	147.55	61.0
699-72-92	561839.42	145359.75	137.51	61.0
699-73-61	571420.82	145781.53	162.5	45.7
699-74-23	582756.43	146203.22	114.9	15.2
699-74-44	576393.09	146098.78	136.28	45.7
699-74-48	575237.72	146037.71	148.88	45.7
699-75-23A	582750.27	146233.69	115.69	12.7
699-75-23B	582744.11	146264.15	115.98	13.0

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
699-77-36	578847.21	146868.94	126.09	45.7
699-77-54	573385.97	146854.8	146.92	47.3
699-78-62	570877.3	147166.22	143.62	45.7
699-80-39B	578418.39	147763.27	123.87	16.2
699-80-43P	576703.93	147729.88	126.68	137.2
699-80-43Q	576703.23	147744.96	126.41	70.7
699-80-43R	576702.46	147760.31	126.45	42.7
699-80-43S	576701.92	147774.69	125.28	15.2
699-81-58	572185.42	148173.42	134.5	45.7
699-81-62	570943.03	148103.09	134.86	308.2
699-83-47	575492.04	148705.25	133.16	45.7
699-84-59	571758.02	149179.75	140.61	305.1
699-86-60	571625.74	149600.8	138.41	161.9
699-87-55	572969.75	149903.97	140.33	28.7
699-89-35	579121.74	150543.51	121.77	22.9
699-93-48A	575094.13	151795.3	133.54	25.3
699-94-41	577223.05	152111.68	124.96	12.2
699-94-43	576625.6	152087.9	129.81	18.5
699-95-45	576257	152556.28	128.54	15.4
699-95-48	575253.42	152323.05	130.69	19.6
699-95-51	574439.5	152528.59	132.29	21.7
699-96-41	576770.62	152607.64	129.18	19.0
699-96-42	576773.16	152612.6	129.21	15.9
699-96-43	576761.45	152605.31	128.71	16.2
699-96-45	576768.17	152607.03	129.19	18.3
699-96-49	574851.25	152858.08	128.26	30.5
699-96-52B	573910.16	152656.22	123.56	14.0
699-97-41	577217.5	153090.38	127.59	17.9
699-97-43	576671.93	153090.27	129.08	30.5
699-97-43B	576859.84	152981.3	129.34	16.3
699-97-43C	576857.31	152980.67	129.41	38.4

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
699-97-45	576051.7	152978.95	126.03	13.9
699-97-45B	576049.34	152979.41	125.99	36.7
699-97-48B	575247.59	152909.76	129.02	18.1
699-97-48C	575245.39	152909.66	129.07	37.5
699-98-43	576863.24	153371.37	122.44	12.0
699-98-46	575726.86	153365.63	127.37	13.9
699-98-51	574339.32	153302.71	120.4	9.2
699-99-41	577283.99	153590.74	125.63	13.9
699-99-42B	577010.23	153761.02	127.12	15.7
699-99-44	576458.77	153592.4	124.16	11.4
B2539	571898.17	149630.62	138.34	19.7
C6446	573597.53	151590.04	139.71	16.8
C6447	573591.97	151559.5	139.85	12.2
C6449	573590.45	151525.64	140.05	16.5
C6450	573579.92	151524.12	138.61	15.2
C7855	573841.65	151608.16	144.13	27.8
C7971	580158.59	147192.84	122.14	10.2
C8205	569405.07	146619.79	144.32	56.8
199-B4-16	566132	144479.9	150.12	62.4
199-B4-18	565401	144392.18	147.22	61.6
199-B5-9	564822	144250	145.38	62.5
199-B5-11	565188.34	144241.27	147.65	76.8
199-B5-13	564893.41	144764.86	139.48	68.1
199-B5-14	564170	144520	140.13	70.4
199-N-109A	571898.17	149630.62	137.29	19.7
699-84-35A	579193.11	149093.71	129.24	112.8
control_1	573314.41	154147.41	121.01	101.0
control_10	578207.05	154782.37	198.79	101.0
control_11	578624.82	154534.81	200.85	101.0
control_12	579021.67	154247.52	203.18	101.0
control_13	579341.84	153651.13	156.98	101.0

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
control_2	573763.89	154399.19	126.61	101.0
control_3	573764.23	155457.96	192.24	101.0
control_4	574318.77	155751.98	195.62	101.0
control_5	575156.39	155729.93	203.26	101.0
control_6	575685.45	155688.26	208.94	101.0
control_7	576352	155586.31	204.51	101.0
control_8	576940.29	155286.58	200.76	101.0
control_9	577647.78	155044.79	193.5	101.0
199-D5-155	573355.2	151346.7	121.12	10.6
199-D5-156	573335.08	151343.2	121.13	10.9
199-D5-157	573347.66	151358.83	121.07	10.4
199-D5-158	573358.48	151411.51	121.02	10.0
699-67-98	559944	143714.66	139.17	56.4
699-96-44	576773.1	152608.21	129.24	18.2
199-F5-49	581133.22	147705.04	126.42	10.9
199-K-203	569212.43	146848.9	142.02	49.3
199-K-204	568648.34	146572.85	142.48	49.7
199-K-210	569058.13	147155.25	125.61	37.2
199-K-212	569954.44	148047.71	129.59	26.2
199-K-220	569356.25	146417.52	145.36	52.2
699-101-48C	575222.89	154411.01	119.51	23.5
RieBC_ctrl 1	562126.2	145211.48	135.22	78.8
RieBC_ctrl 2	562378.17	144938.51	136.24	80.2
RieBC_ctrl 3	562740.37	144670.8	133.62	81.0
RieBC_ctrl 4	563013.34	144308.59	132.8	82.7
RieBC_ctrl 5	563470.03	144035.63	141.47	82.7
RieBC_ctrl 6	564204.94	143647.17	148.86	85.5
RieBC_ctrl 7	565412.28	143458.2	148.94	88.2
RieBC_ctrl 8	566661.63	143458.2	161.76	90.2
RieBC_ctrl 9	567412.28	143699.67	160.87	92.6
199-B2-13	564086.52	145264.56	127.69	12.2

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-B3-1	565561.46	145342.08	134.88	19.2
199-B3-47	565388.66	145368.95	133.85	18.6
199-B3-52	565391	145115.03	134.66	18.3
199-B4-1	565289.81	144791.53	141.6	27.4
199-B4-10	565396.56	144516.37	144.69	7.2
199-B4-14	564969.25	144313.98	144.97	29.2
199-B4-15	565439.68	144551.98	144.26	25.7
199-B4-2	565283.84	144770.89	141.65	27.4
199-B4-3	565295.59	144771.13	141.76	27.7
199-B4-4	565377.08	144479.71	145.37	32.0
199-B4-5	565390.51	144349.16	147.06	29.6
199-B4-6	565388.88	144382.97	147.02	29.7
199-B4-7	565398.86	144382.85	147.07	29.4
199-B4-9	565395.64	144563.93	143.81	28.3
199-B5-10	564812.14	144250.15	145.41	30.7
199-B5-12	565178.86	144241.26	147.51	31.8
199-B5-2	565405.43	144939.7	139.8	22.9
199-B8-6	564498.83	144157.79	145.02	27.7
199-B9-1	565501.96	144029.69	152.25	35.7
199-B9-2	565534.79	144078.08	151.73	36.0
199-B9-3	565667.36	144046.72	150.41	33.2
199-D5-100	573180.85	151224.96	143.47	8.7
199-D8-101	574069.46	152262.43	136.38	22.0
199-F5-55	581076.1	147797.57	126.81	15.2
199-F5-56	580440.62	147556.36	127.21	15.5
199-H3-11	577786.74	152490.41	130.21	16.6
199-H4-6	577585.32	152888.39	129.07	16.8
199-H4-83	578135.04	152634.01	126.48	14.8
199-H4-84	577902.58	152848.73	128.66	14.5
199-K-155	570230.01	147950.01	137.84	9.9
199-K-167	568675.81	146267.56	145.47	11.3

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-K-28	569171.71	146772.77	143.06	27.4
199-K-33	568573.65	146713.25	135.33	20.3
199-N-179	571349.81	149956.66	122.03	6.1
199-N-201	571198.46	149759.46	123.48	8.1
199-N-202	571200.86	149763.38	123.51	5.2
199-N-204	571205.06	149771.42	123.49	4.9
199-N-218	571241.44	149824.3	123.16	5.2
199-N-219	571243.95	149827.76	123.25	8.4
199-N-226	571262.4	149853.86	123.35	4.9
199-N-229	571271.28	149864.74	123.21	8.1
199-N-230	571274.06	149868.47	123.17	4.8
199-N-233	571282.66	149879.08	123.12	8.3
199-N-240	571361.72	149969.69	122.22	8.1
199-N-253	571396.29	150016.73	122.03	5.2
199-N-257	571406.1	150032.2	121.82	5.2
199-N-258	571408.97	150036.13	121.78	8.1
199-N-259	571411.1	150039.97	121.82	5.2
199-N-260	571413.69	150043.62	121.82	8.1
199-N-261	571416	150047.74	121.86	5.4
199-N-265	571426.1	150063.07	121.87	5.3
199-N-269	571436.02	150078.94	121.84	5.3
199-N-270	571438.52	150082.34	121.81	8.1
199-N-271	571440.22	150085.6	121.85	5.5
199-N-272	571441.87	150088.52	121.9	8.2
199-N-274	571446.84	150098.38	121.94	7.9
199-N-291	571484.24	150164.36	121.77	5.3
199-N-301	571516.95	150196.62	121.98	5.3
199-N-302	571520.09	150199.9	121.99	8.3
199-N-316	571558.24	150251.37	121.91	8.4
199-N-317	571560.87	150254.88	121.87	5.3
199-N-325	571580.17	150286.26	122.07	5.5

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-N-339	571615.1	150339.64	122.1	5.3
199-N-356	571446.09	150101.5	122	7.8
199-N-365	571583.77	150296.66	122.1	8.1
199-N-368	571344.44	149948.28	122.07	8.0
199-N-369	571341.78	149947.72	122.13	8.0
199-N-370	571339.68	149945.71	122.14	8.0
699-58-24	582308.82	141345.92	128.66	18.3
699-59-32	580010.34	141607.38	130.34	22.9
699-61-37	578587.19	141964.33	136.06	23.2
699-61-62	570914.86	141921.66	151.76	57.3
699-61-66	569787.59	142007.96	160.19	68.6
699-63-92	561559.74	142637.44	152.63	56.7
699-63-95	560914.64	142650.82	148.78	215.5
699-65-72	567883.67	143107.92	165.68	65.8
699-65-83	564590.47	143249.09	149.05	36.9
699-65-95	560815.43	143192.93	138.86	32.3
699-66-103	558538.77	143553.25	142.35	39.0
699-66-58	572266.66	143532.66	154.4	34.3
699-66-64	570290.74	143734.12	155.19	36.0
699-66-91	562174.81	143476.8	143.57	57.9
699-67-77	566423.4	143896.6	150.66	0.0
699-68-105	557803.35	144206.12	139.45	28.7
699-71-85	564039.81	145012.86	128.17	0.0
699-72-88	563247.29	145359.93	133.1	16.5
699-81-38	578172.35	148241.56	124.89	10.8
699-81-64B	570385.8	148163.8	136.64	11.6
699-91-46A	575910.95	151156.64	127.26	13.9
B2537	571541.51	149812.5	140.25	22.1
C5670	564376.35	143840	140.88	22.6
C7842	565391.93	145327.43	133.42	16.8
C7844	565290.19	144761.31	141.36	22.3

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
C7845	565355.92	144638.85	143.1	24.1
C7847	565340.87	144511.79	144.1	4.1
C7849	565397.34	144026.97	151.81	32.8
C7850	573888.94	152315.27	136.39	22.0
C7851	573701.48	152307.29	135.88	21.0
C7862	577708.85	152479.39	129.61	16.0
C7864	578090.07	152428.01	128.74	15.5
C7883	564812.4	144161.1	145.49	27.3
C7884	564734.5	144158.1	145.38	27.8
C8239	565331.7	144527.57	144.04	25.1
199-D5-159	573474.25	151910.82	143.3	32.5
199-H1-46	576986.9	153456.95	125.79	15.4
199-H4-92	576723.3	152233.84	127.64	17.9
199-H4-93	577025.75	152703.33	129.7	17.7
199-H6-7	577704.08	151478.02	128.42	16.7
199-H6-8	578205.59	151928.15	128.67	22.5
199-K-207	569409.77	146979.8	141.27	47.4
199-K-208	569291.76	147170.23	133	40.8
199-K-209	572552.36	147065.85	150.25	47.1
199-K-221	569129.42	146753.91	137.67	31.9
199-K-222	569186.78	146730.6	143.02	36.2
199-N-165	571261.01	149155.16	140.73	26.2
199-N-375	571395.05	149514.01	140	30.5
699-93-48C	575312.13	151728.96	130.6	20.4
699-95-45B	576365.99	152780.01	126.81	14.1
699-97-47B	575408.55	153265.29	125.71	11.7
699-97-60	575682.05	152794.99	127.51	27.1
699-97-61	574891.51	152914.15	128.33	30.8
199-H5-16	576906.8	151646.31	129.18	20.8
RebblCT-13	573283.15	151313.62	143.10007	150.0
199-D4-102	572750.41	151458.68	143.52	33.5

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D4-103	572749.45	151243.34	143.675	33.7
199-D5-149	573327.62	151461.82	143.918	34.3
199-D5-150	573429.42	151401.85	143.883	33.9
199-D5-151	573312.03	151391.88	139.643	29.7
199-D5-152	573300.18	151349.1	139.013	29.9
199-D5-160	573517.16	151429.17	143.676	34.9
199-D8-102	573661.84	152076.09	142.582	34.7
199-H4-87	577736.16	152667.79	129.25	19.8
199-H4-88	577850.51	152833.59	130.917	18.3
199-H4-89	577923.32	152893.98	128.198	17.3
199-K-223	568781.07	146145.09	144.75	54.1
199-K-224	568735.26	146205.95	145.945	56.7
199-K-225	569281.59	146457.74	145.109	50.3
199-K-226	569186.87	147038.68	135.145	45.4
199-N-371	571133.65	149571.82	138.416	29.3
199-N-372	571104.79	149500.24	139.074	32.1
199-N-373	571276.14	149441.79	139.425	30.9
199-N-374	571116.32	149532.29	139.118	31.1
199-N-376	571137.72	149346.36	140.129	33.3
199-N-377	571277.91	149677.94	139.684	33.3
699-66-30	580895.57	143649.79	121.19	9.6
699-66-32	580059.33	143628.39	126.567	11.9
699-67-26	581949.54	143798.07	120.788	12.6
699-71-26	581918.55	145176	121.34	12.4
699-71-34	579602.08	145271.21	120.949	11.2
699-75-28	581538.22	146514.93	125.066	18.0
699-75-31	580385.85	146516.19	123.213	12.4
699-75-34	579477.05	146444.09	122.45	13.6
699-75-34B	579478.3	146447.03	122.628	12.8
699-88-41A	577406.82	150957.6	127.926	29.3
699-90-45B	576441.52	150967	129.666	20.9

Table A-1. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Used in the Model

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
699-90-47B	575298.23	150951.48	130.18	20.5
699-93-37A	578449.32	151455.62	125.374	20.3

* = Maximum drill depth is approximately ± 1 m of actual borehole total drill depth to facilitate model visualization.

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-B4-16	0	38.1	Hanford
control_1	8.8	100	RUM
control_10	86.5	100	RUM
control_11	88.5	100	RUM
control_2	15.6	100	RUM
control_6	100	101	RUM
control_7	93.5	100	RUM
control_9	80.5	100	RUM
199-B2-12	0	3	Hanford
199-B2-12	3	3.8	RE Reworked
199-B2-12	3.8	45.5	RE
199-B2-12	45.5	45.7	RUM Reworked
199-B2-12	45.7	54.5	RUM
199-B2-14	0	8.5	Hanford
199-B2-14	8.5	10.1	RE Reworked
199-B2-14	10.1	42.1	RE
199-B2-14	42.1	43.8	RUM Reworked
199-B2-14	43.8	46.4	RUM
199-B2-15	0	9.5	Hanford
199-B2-15	9.5	43.8	RE
199-B2-15	43.8	59.1	RUM
199-B2-16	0	9.1	Hanford
199-B2-16	9.1	9.8	RE Reworked
199-B2-16	9.8	44.8	RE
199-B2-16	44.8	47.3	RUM
199-B3-2	0	13.7	Hanford
199-B3-2	13.7	46.6	RE
199-B3-2	46.6	199.939	RUM
199-B3-46	0	15.2	Hanford
199-B3-46	15.2	20.4	RE
199-B3-50	0	27.7	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-B3-50	27.7	54	RE
199-B3-50	54	55.9	RUM
199-B3-51	0	4	Hanford
199-B3-51	4	5.5	RE Reworked
199-B3-51	5.5	45.6	RE
199-B3-51	45.6	47.6	RUM
199-B4-16	38.1	39.6	RE Reworked
199-B4-16	39.6	59.7	RE
199-B4-16	59.7	60.7	RUM Reworked
199-B4-16	60.7	62.4	RUM
199-B4-18	0	28.7	Hanford
199-B4-18	28.7	34.1	RE Reworked
199-B4-18	34.1	59.4	RE
199-B4-18	59.4	61.6	RUM
199-B4-8	0	26.8	Hanford
199-B4-8	26.8	27.6	RE
199-B5-1	0	12.2	Hanford
199-B5-1	12.2	15.2	RE Reworked
199-B5-1	15.2	46	RE
199-B5-10	0	30.7	Hanford
199-B5-11	0	32	Hanford
199-B5-11	32	60.4	RE
199-B5-11	60.4	76.8	RUM
199-B5-12	0	31.8	Hanford
199-B5-13	0	13.7	Hanford
199-B5-13	13.7	18.3	RE Reworked
199-B5-13	18.3	62.8	RE
199-B5-13	62.8	66.5	RUM Reworked
199-B5-13	66.5	68.1	RUM
199-B5-14	0	16.8	Hanford
199-B5-14	16.8	21.3	RE Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-B5-14	21.3	68.5	RE
199-B5-14	68.5	70.4	RUM
199-B5-2	0	22.9	Hanford
199-B5-5	0	16.2	Hanford
199-B5-5	16.2	60.7	RE
199-B5-5	60.7	62.5	RUM Reworked
199-B5-5	62.5	65.5	RUM
199-B5-6	0	28.4	Hanford
199-B5-6	28.4	56.4	RE
199-B5-6	56.4	58.2	RUM Reworked
199-B5-6	58.2	59.6	RUM
199-B5-8	0	59.7	Hanford
199-B5-8	59.7	67.1	RE
199-B5-8	67.1	67.8	RUM Reworked
199-B5-8	67.8	70.3	RUM
199-B5-9	0	32	Hanford
199-B5-9	32	58.8	RE
199-B5-9	58.8	62.5	RUM
199-B8-6	0	27.7	Hanford
199-B8-9	0	37.2	Hanford
199-B8-9	37.2	43.9	RE Reworked
199-B8-9	43.9	64.5	RE
199-B8-9	64.5	66.9	RUM
199-B9-1	0	35.7	Hanford
199-B9-2	0	36	Hanford
199-B9-3	0	33.2	Hanford
199-D2-10	0	7.9	Hanford
199-D2-10	7.9	9.5	RUM
199-D2-11	0	24.8	Hanford
199-D2-11	24.8	27.5	RE Reworked
199-D2-11	27.5	32.9	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D2-11	32.9	34.8	RUM
199-D2-12	0	8.6	Hanford
199-D2-12	8.6	10.4	RUM
199-D2-5	0	21.6	Hanford
199-D2-5	21.6	26.2	RE
199-D2-5	26.2	29	RUM
199-D2-6	0	22.9	Hanford
199-D2-6	22.9	31.4	RE
199-D2-6	31.4	33.7	RUM
199-D3-3	0	19.5	Hanford
199-D3-3	19.5	34	RE
199-D3-3	34	34.6	RUM Reworked
199-D3-3	34.6	34.8	RUM
199-D3-4	0	20.6	Hanford
199-D3-4	20.6	33.8	RE
199-D3-4	33.8	34.4	RUM Reworked
199-D3-4	34.4	34.8	RUM
199-D3-5	0	26.5	Hanford
199-D3-5	26.5	30.9	RE
199-D3-5	30.9	31.7	RUM Reworked
199-D3-5	31.7	34.2	RUM
199-D4-1	0	16.8	Hanford
199-D4-1	16.8	29	RE
199-D4-1	29	29.9	RUM Reworked
199-D4-1	29.9	32	RUM
199-D4-10	0	16.5	Hanford
199-D4-10	16.5	29	RE
199-D4-10	29	29.8	RUM Reworked
199-D4-101	0	19.2	Hanford
199-D4-101	19.2	31.1	RE
199-D4-101	31.1	32	RUM Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-101	32	33.5	RUM
199-D4-11	0	17.1	Hanford
199-D4-11	17.1	29	RE
199-D4-11	29	29.6	RUM Reworked
199-D4-12	0	18.3	Hanford
199-D4-12	18.3	21	RE Reworked
199-D4-12	21	29.6	RE
199-D4-12	29.6	30.1	RUM
199-D4-13	0	15.5	Hanford
199-D4-13	15.5	27.7	RE
199-D4-13	27.7	30.8	RUM
199-D4-14	0	13.1	Hanford
199-D4-14	13.1	29.6	RE
199-D4-14	29.6	29.9	RUM Reworked
199-D4-14	29.9	31.1	RUM
199-D4-15	0	15.2	Hanford
199-D4-15	15.2	30.5	RE
199-D4-15	30.5	32	RUM
199-D4-16	0	17.1	Hanford
199-D4-16	17.1	29	RE
199-D4-16	29	29.6	RUM Reworked
199-D4-16	29.6	31	RUM
199-D4-17	0	17.7	Hanford
199-D4-17	17.7	29.3	RE
199-D4-17	29.3	29.6	RUM Reworked
199-D4-17	29.6	31.4	RUM
199-D4-18	0	11.6	Hanford
199-D4-18	11.6	16.5	RE Reworked
199-D4-18	16.5	25.6	RE
199-D4-18	25.6	29.1	RUM Reworked
199-D4-18	29.1	31.1	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-19	0	18.8	Hanford
199-D4-19	18.8	33.5	RE
199-D4-19	33.5	33.7	RUM
199-D4-2	29.7	30.5	RUM
199-D4-20	0	16.8	Hanford
199-D4-20	16.8	19.2	RE Reworked
199-D4-20	19.2	32	RE
199-D4-20	32	32.8	RUM
199-D4-21	0	12.2	Hanford
199-D4-21	12.2	14.9	RE Reworked
199-D4-21	14.9	29.7	RE
199-D4-21	29.7	30.2	RUM
199-D4-22	0	17.7	Hanford
199-D4-22	17.7	29.9	RE
199-D4-22	29.9	30.8	RUM
199-D4-23	0	13.7	Hanford
199-D4-23	13.7	25.3	RE
199-D4-23	25.3	26.8	RUM
199-D4-24	0	14.3	Hanford
199-D4-24	14.3	15.4	RE Reworked
199-D4-24	15.4	30	RE
199-D4-24	30	30.8	RUM
199-D4-25	0	15.7	Hanford
199-D4-25	15.7	30.9	RE
199-D4-25	30.9	32.3	RUM
199-D4-26	0	18	Hanford
199-D4-26	18	30.8	RE
199-D4-26	30.8	32	RUM
199-D4-27	0	17.1	Hanford
199-D4-27	17.1	30.8	RE
199-D4-27	30.8	32	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-28	0	17.1	Hanford
199-D4-28	17.1	29.3	RE
199-D4-28	29.3	30	RUM Reworked
199-D4-28	30	31.1	RUM
199-D4-29	0	17.7	Hanford
199-D4-29	17.7	29.1	RE
199-D4-29	29.1	29.9	RUM Reworked
199-D4-29	29.9	31.1	RUM
199-D4-3	0	15.9	Hanford
199-D4-3	15.9	17.4	RE Reworked
199-D4-3	17.4	29.9	RE
199-D4-3	29.9	31.1	RUM
199-D4-30	0	16.5	Hanford
199-D4-30	16.5	29.3	RE
199-D4-30	29.3	29.6	RUM Reworked
199-D4-30	29.6	29.7	RUM
199-D4-31	0	16.5	Hanford
199-D4-31	16.5	29.4	RE
199-D4-31	29.4	29.6	RUM Reworked
199-D4-31	29.6	29.9	RUM
199-D4-32	0	15.9	Hanford
199-D4-32	15.9	29.9	RE
199-D4-32	29.9	30.8	RUM
199-D4-33	0	15.2	Hanford
199-D4-33	15.2	30.3	RE
199-D4-33	30.3	31.4	RUM
199-D4-34	0	17.1	Hanford
199-D4-34	17.1	29.3	RE
199-D4-34	29.3	30.3	RUM Reworked
199-D4-34	30.3	31.7	RUM
199-D4-35	0	17.7	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-35	17.7	29	RE
199-D4-35	29	29.6	RUM Reworked
199-D4-35	29.6	31.1	RUM
199-D4-36	0	17.2	Hanford
199-D4-36	17.2	29.3	RE
199-D4-36	29.3	29.6	RUM Reworked
199-D4-36	29.6	31.1	RUM
199-D4-37	0	16.8	Hanford
199-D4-37	16.8	29.9	RE
199-D4-37	29.9	31.1	RUM
199-D4-38	0	16.6	Hanford
199-D4-38	16.6	29.9	RE
199-D4-38	29.9	31.1	RUM
199-D4-39	0	15.2	Hanford
199-D4-39	15.2	29.4	RE
199-D4-39	29.4	29.7	RUM Reworked
199-D4-39	29.7	31.1	RUM
199-D4-4	0	17.3	Hanford
199-D4-4	17.3	29.7	RE
199-D4-4	29.7	32.3	RUM
199-D4-40	0	15.2	Hanford
199-D4-40	15.2	16.5	RE Reworked
199-D4-40	16.5	29.6	RE
199-D4-40	29.6	29.9	RUM Reworked
199-D4-40	29.9	30.7	RUM
199-D4-41	0	16.5	Hanford
199-D4-41	16.5	29.4	RE
199-D4-41	29.4	30.1	RUM Reworked
199-D4-41	30.1	30.8	RUM
199-D4-42	0	14.3	Hanford
199-D4-42	14.3	30.6	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-42	30.6	32	RUM
199-D4-43	0	16.5	Hanford
199-D4-43	16.5	29	RE
199-D4-43	29	30.5	RUM Reworked
199-D4-43	30.5	31.1	RUM
199-D4-44	0	17.1	Hanford
199-D4-44	17.1	29.6	RE
199-D4-44	29.6	30.6	RUM Reworked
199-D4-44	30.6	31.4	RUM
199-D4-45	0	16.8	Hanford
199-D4-45	16.8	29.3	RE
199-D4-45	29.3	29.6	RUM Reworked
199-D4-45	29.6	32.3	RUM
199-D4-46	0	16.2	Hanford
199-D4-46	16.2	29	RE
199-D4-46	29	30.8	RUM Reworked
199-D4-46	30.8	31.7	RUM
199-D4-47	0	17.1	Hanford
199-D4-47	17.1	29	RE
199-D4-47	29	30.5	RUM Reworked
199-D4-47	30.5	31.2	RUM
199-D4-48	0	17.4	Hanford
199-D4-48	17.4	29.3	RE
199-D4-48	29.3	31.7	RUM Reworked
199-D4-48	31.7	32.9	RUM
199-D4-49	0	17.7	Hanford
199-D4-49	17.7	19.2	RE Reworked
199-D4-49	19.2	27.4	RE
199-D4-49	27.4	29.9	RUM Reworked
199-D4-49	29.9	30.5	RUM
199-D4-5	0	17.4	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-5	17.4	29.3	RE
199-D4-5	29.3	30.8	RUM
199-D4-50	0	17.4	Hanford
199-D4-50	17.4	29.7	RE
199-D4-50	29.7	29.9	RUM
199-D4-51	0	16.8	Hanford
199-D4-51	16.8	18.3	RE Reworked
199-D4-51	18.3	29.9	RE
199-D4-51	29.9	30.4	RUM
199-D4-52	0	18.1	Hanford
199-D4-52	18.1	29.3	RE
199-D4-52	29.3	29.9	RUM Reworked
199-D4-52	29.9	30.4	RUM
199-D4-53	0	14.3	Hanford
199-D4-53	14.3	17.4	RE Reworked
199-D4-53	17.4	27.7	RE
199-D4-53	27.7	29.6	RUM Reworked
199-D4-53	29.6	29.7	RUM
199-D4-54	0	18	Hanford
199-D4-54	18	28.7	RE
199-D4-54	28.7	29.7	RUM Reworked
199-D4-54	29.7	30	RUM
199-D4-55	0	18.6	Hanford
199-D4-55	18.6	28	RE
199-D4-55	28	29.9	RUM Reworked
199-D4-55	29.9	30.3	RUM
199-D4-56	0	16.2	Hanford
199-D4-56	16.2	17.4	RE Reworked
199-D4-56	17.4	29.7	RE
199-D4-57	29.6	29.9	RUM Reworked
199-D4-57	29.9	30	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-58	0	22.9	Hanford
199-D4-58	22.9	29.4	RE
199-D4-58	29.4	31.3	RUM Reworked
199-D4-58	31.3	32.5	RUM
199-D4-59	0	19.8	Hanford
199-D4-59	19.8	29.9	RE
199-D4-59	29.9	30.5	RUM Reworked
199-D4-59	30.5	31.2	RUM
199-D4-6	0	16.3	Hanford
199-D4-6	16.3	29.3	RE
199-D4-6	29.3	30.8	RUM
199-D4-60	0	18.9	Hanford
199-D4-60	18.9	30.8	RE
199-D4-60	30.8	30.9	RUM
199-D4-61	0	18.9	Hanford
199-D4-61	18.9	29.3	RE
199-D4-61	29.3	31.1	RUM Reworked
199-D4-61	31.1	31.2	RUM
199-D4-62	0	15.5	Hanford
199-D4-62	15.5	18.6	RE Reworked
199-D4-62	18.6	24.7	RE
199-D4-62	24.7	33.2	RUM Reworked
199-D4-62	33.2	33.4	RUM
199-D4-63	0	16.2	Hanford
199-D4-63	16.2	18.6	RE Reworked
199-D4-63	18.6	28	RE
199-D4-63	28	33.5	RUM Reworked
199-D4-63	33.5	33.9	RUM
199-D4-64	0	19.8	Hanford
199-D4-64	19.8	30.5	RE
199-D4-64	30.5	33.7	RUM Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-64	33.7	33.8	RUM
199-D4-65	0	16.2	Hanford
199-D4-65	16.2	18.9	RE Reworked
199-D4-65	18.9	33.8	RE
199-D4-65	33.8	34.1	RUM
199-D4-66	0	19.1	Hanford
199-D4-66	19.1	33.7	RE
199-D4-66	33.7	33.8	RUM
199-D4-67	0	17.4	Hanford
199-D4-67	17.4	18.6	RE Reworked
199-D4-67	18.6	31.7	RE
199-D4-67	31.7	33.8	RUM Reworked
199-D4-67	33.8	33.9	RUM
199-D4-68	0	16.5	Hanford
199-D4-68	16.5	18.3	RE Reworked
199-D4-68	18.3	31.7	RE
199-D4-68	31.7	34.1	RUM Reworked
199-D4-68	34.1	34.2	RUM
199-D4-69	0	18	Hanford
199-D4-69	18	31.4	RE
199-D4-69	31.4	33.5	RUM Reworked
199-D4-69	33.5	33.6	RUM
199-D4-7	0	17.1	Hanford
199-D4-7	17.1	29.3	RE
199-D4-70	0	16.8	Hanford
199-D4-70	16.8	18.6	RE Reworked
199-D4-70	18.6	32.6	RE
199-D4-70	32.6	33.7	RUM Reworked
199-D4-70	33.7	33.8	RUM
199-D4-71	0	17.1	Hanford
199-D4-71	17.1	18.3	RE Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-71	18.3	33.4	RE
199-D4-71	33.4	33.7	RUM Reworked
199-D4-71	33.7	33.8	RUM
199-D4-72	0	18	Hanford
199-D4-72	18	33.8	RE
199-D4-72	33.8	33.9	RUM
199-D4-73	0	18.4	Hanford
199-D4-73	18.4	34	RE
199-D4-73	34	34.1	RUM
199-D4-74	0	18.3	Hanford
199-D4-74	18.3	34	RE
199-D4-74	34	34.1	RUM
199-D4-75	0	15.4	Hanford
199-D4-75	15.4	18.1	RE Reworked
199-D4-75	18.1	34.4	RE
199-D4-75	34.4	34.5	RUM Reworked
199-D4-76	0	14.6	Hanford
199-D4-76	14.6	18.4	RE Reworked
199-D4-76	18.4	34.3	RE
199-D4-76	34.3	34.4	RUM
199-D4-77	0	18	Hanford
199-D4-77	18	18.4	RE Reworked
199-D4-77	18.4	33.7	RE
199-D4-77	33.7	33.8	RUM Reworked
199-D4-77	33.8	33.9	RUM
199-D4-78	0	18.6	Hanford
199-D4-78	18.6	33.7	RE
199-D4-78	33.7	34.1	RUM Reworked
199-D4-78	34.1	34.4	RUM
199-D4-79	0	19.2	Hanford
199-D4-79	19.2	33.5	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-79	33.5	34.4	RUM Reworked
199-D4-79	34.4	35.1	RUM
199-D4-8	0	16.9	Hanford
199-D4-8	16.9	29.3	RE
199-D4-8	29.3	30.2	RUM
199-D4-80	0	18.6	Hanford
199-D4-80	18.6	34.4	RE
199-D4-81	0	18.8	Hanford
199-D4-81	18.8	33.8	RE
199-D4-81	33.8	34.3	RUM Reworked
199-D4-81	34.3	34.4	RUM
199-D4-82	0	19.8	Hanford
199-D4-82	19.8	34.3	RE
199-D4-82	34.3	34.6	RUM Reworked
199-D4-82	34.6	35.1	RUM
199-D4-83	0	16.8	Hanford
199-D4-83	16.8	25.9	RE
199-D4-83	25.9	29	RUM Reworked
199-D4-83	29	29.9	RUM
199-D4-84	0	21	Hanford
199-D4-84	21	29.9	RE
199-D4-84	29.9	30.9	RUM Reworked
199-D4-84	30.9	31.6	RUM
199-D4-85	0	18.9	Hanford
199-D4-85	18.9	32.6	RE
199-D4-85	32.6	33.8	RUM Reworked
199-D4-85	33.8	35.1	RUM
199-D4-86	0	18.9	Hanford
199-D4-86	18.9	33.5	RE
199-D4-86	33.5	34	RUM Reworked
199-D4-86	34	34.3	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-87	0	19.8	Hanford
199-D4-87	19.8	29.6	RE
199-D4-87	29.6	29.7	RUM
199-D4-88	0	18.3	Hanford
199-D4-88	18.3	29.9	RE
199-D4-89	0	19.8	Hanford
199-D4-89	19.8	29.1	RE
199-D4-9	0	17.4	Hanford
199-D4-9	17.4	29.1	RE
199-D4-9	29.1	29.4	RUM Reworked
199-D4-9	29.4	29.7	RUM
199-D4-90	0	17.4	Hanford
199-D4-90	17.4	30.2	RE
199-D4-90	30.2	30.9	RUM
199-D4-91	0	17.1	Hanford
199-D4-91	17.1	29	RE
199-D4-91	29	29.6	RUM Reworked
199-D4-91	29.6	30.4	RUM
199-D4-92	0	17.3	Hanford
199-D4-92	17.3	31.2	RE
199-D4-92	31.2	32.5	RUM
199-D4-93	0	17.4	Hanford
199-D4-93	17.4	31	RE
199-D4-93	31	32.1	RUM
199-D4-94	0	17.4	Hanford
199-D4-94	17.4	30	RE
199-D4-94	30	31.3	RUM
199-D4-95	0	20.4	Hanford
199-D4-95	20.4	35.2	RE
199-D4-95	35.2	37	RUM
199-D4-96	0	15.2	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-96	15.2	17.4	RE Reworked
199-D4-96	17.4	30.5	RE
199-D4-96	30.5	32.5	RUM
199-D4-97	0	13.7	Hanford
199-D4-97	13.7	15.2	RE Reworked
199-D4-97	15.2	31.9	RE
199-D4-97	31.9	33.5	RUM
199-D4-98	0	18	Hanford
199-D4-98	18	31.3	RE
199-D4-98	31.3	32.3	RUM Reworked
199-D4-98	32.3	33.8	RUM
199-D4-99	0	18.6	Hanford
199-D4-99	18.6	33.4	RE
199-D4-99	33.4	35.4	RUM
199-D5-100	0	8.7	Hanford
199-D5-101	0	17.1	Hanford
199-D5-101	17.1	32.9	RE
199-D5-101	32.9	33.5	RUM Reworked
199-D5-101	33.5	34.8	RUM
199-D5-102	32.9	34.6	RUM
199-D5-103	0	18.3	Hanford
199-D5-103	18.3	33.7	RE
199-D5-103	33.7	35.7	RUM
199-D5-104	0	19.8	Hanford
199-D5-104	19.8	33.6	RE
199-D5-104	33.6	35.4	RUM
199-D5-106	0	16.5	Hanford
199-D5-106	16.5	32.7	RE
199-D5-107	0	18.3	Hanford
199-D5-107	18.3	19.8	RE Reworked
199-D5-107	19.8	30.8	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D5-107	30.8	31.7	RUM
199-D5-108	0	19.8	Hanford
199-D5-108	19.8	22.9	RE Reworked
199-D5-108	22.9	31.4	RE
199-D5-108	31.4	32.3	RUM
199-D5-109	0	18.3	Hanford
199-D5-109	18.3	22.3	RE Reworked
199-D5-109	22.3	31.2	RE
199-D5-109	31.2	31.7	RUM Reworked
199-D5-109	31.7	31.8	RUM
199-D5-110	0	19.8	Hanford
199-D5-110	19.8	20.7	RE Reworked
199-D5-110	20.7	30.2	RE
199-D5-110	30.2	30.6	RUM Reworked
199-D5-110	30.6	31.2	RUM
199-D5-111	0	18.3	Hanford
199-D5-111	18.3	21.3	RE Reworked
199-D5-111	21.3	30.5	RE
199-D5-111	30.5	31	RUM
199-D5-112	0	16.8	Hanford
199-D5-112	16.8	20.7	RE Reworked
199-D5-112	20.7	28.6	RE
199-D5-113	0	18.9	Hanford
199-D5-113	18.9	20.7	RE Reworked
199-D5-113	20.7	30.6	RE
199-D5-113	30.6	31.1	RUM
199-D5-114	0	22.3	Hanford
199-D5-114	22.3	31.8	RE
199-D5-115	0	22.3	Hanford
199-D5-115	22.3	31.7	RE
199-D5-115	31.7	32	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D5-116	0	22.6	Hanford
199-D5-116	22.6	31.7	RE
199-D5-116	31.7	31.9	RUM
199-D5-117	0	22	Hanford
199-D5-117	22	22.4	RE Reworked
199-D5-117	22.4	27.9	RE
199-D5-118	0	22.4	Hanford
199-D5-118	22.4	31.7	RE
199-D5-118	31.7	31.9	RUM
199-D5-12	0	14.6	Hanford
199-D5-12	14.6	27.1	RE
199-D5-12	27.1	27.7	RUM
199-D5-120	0	16.2	Hanford
199-D5-120	16.2	18.3	RE Reworked
199-D5-120	18.3	32.9	RE
199-D5-120	32.9	34.3	RUM
199-D5-121	0	19.2	Hanford
199-D5-121	19.2	32.6	RE
199-D5-121	32.6	32.9	RUM Reworked
199-D5-121	32.9	34.1	RUM
199-D5-123	0	13.7	Hanford
199-D5-123	13.7	18.3	RE Reworked
199-D5-123	18.3	32.9	RE
199-D5-123	32.9	37.7	RUM Reworked
199-D5-125	0	14.9	Hanford
199-D5-125	14.9	32	RE
199-D5-125	32	32.6	RUM Reworked
199-D5-125	32.6	34.1	RUM
199-D5-126	0	15.2	Hanford
199-D5-126	15.2	16.8	RE Reworked
199-D5-126	16.8	31.4	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D5-126	31.4	33.5	RUM Reworked
199-D5-126	33.5	34.8	RUM
199-D5-127	0	19.5	Hanford
199-D5-127	19.5	21.3	RE Reworked
199-D5-127	21.3	30.2	RE
199-D5-127	30.2	32.3	RUM Reworked
199-D5-127	32.3	33.2	RUM
199-D5-128	0	18.9	Hanford
199-D5-128	18.9	21.3	RE Reworked
199-D5-128	21.3	29.9	RE
199-D5-128	29.9	30.5	RUM Reworked
199-D5-128	30.5	32.5	RUM
199-D5-129	0	16.8	Hanford
199-D5-129	16.8	18.3	RE Reworked
199-D5-129	18.3	30.5	RE
199-D5-129	30.5	32.2	RUM Reworked
199-D5-129	32.2	34.6	RUM
199-D5-13	0	15.5	Hanford
199-D5-13	15.5	29.7	RE
199-D5-130	0	13.4	Hanford
199-D5-130	13.4	14.6	RE Reworked
199-D5-130	14.6	29	RE
199-D5-130	29	30.2	RUM Reworked
199-D5-130	30.2	30.9	RUM
199-D5-131	0	16.8	Hanford
199-D5-131	16.8	32.3	RE
199-D5-131	32.3	33.2	RUM Reworked
199-D5-131	33.2	35.5	RUM
199-D5-132	0	15.5	Hanford
199-D5-132	15.5	32	RE
199-D5-132	32	32.3	RUM Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D5-132	32.3	34.1	RUM
199-D5-133	0	14	Hanford
199-D5-133	14	16.2	RE Reworked
199-D5-133	16.2	31.6	RE
199-D5-133	31.6	32.2	RUM Reworked
199-D5-133	32.2	34.1	RUM
199-D5-134	0	17.1	Hanford
199-D5-134	17.1	18.8	RE Reworked
199-D5-134	18.8	33.1	RE
199-D5-134	33.1	34.1	RUM Reworked
199-D5-134	34.1	82.3	RUM
199-D5-14	0	16.2	Hanford
199-D5-14	16.2	30.8	RE
199-D5-140	0	13.4	Hanford
199-D5-140	13.4	14.6	RE Reworked
199-D5-140	14.6	32.3	RE
199-D5-140	32.3	32.9	RUM Reworked
199-D5-140	32.9	34.4	RUM
199-D5-141	0	17.1	Hanford
199-D5-141	17.1	18.6	RE Reworked
199-D5-141	18.6	34.3	RE
199-D5-141	34.3	35.1	RUM Reworked
199-D5-141	35.1	96.5	RUM
199-D5-142	0	14	Hanford
199-D5-142	14	27.4	RE
199-D5-143	0	14.3	Hanford
199-D5-143	14.3	17.1	RE Reworked
199-D5-143	17.1	31.7	RE
199-D5-143	31.7	36	RUM Reworked
199-D5-144	0	16.8	Hanford
199-D5-144	16.8	22.9	RE Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D5-144	22.9	33.1	RE
199-D5-144	33.1	35.2	RUM
199-D5-145	0	18	Hanford
199-D5-145	18	21.6	RE Reworked
199-D5-145	21.6	32.9	RE
199-D5-145	32.9	34.6	RUM Reworked
199-D5-145	34.6	36.2	RUM
199-D5-147	0	16.9	Hanford
199-D5-147	16.9	31.1	RE
199-D5-147	31.1	31.6	RUM Reworked
199-D5-147	31.6	33	RUM
199-D5-148	0	26.7	Hanford
199-D5-148	26.7	32.6	RE
199-D5-148	32.6	35.1	RUM
199-D5-15	0	15.2	Hanford
199-D5-15	15.2	31	RE
199-D5-153	0	14.6	Hanford
199-D5-153	14.6	30.2	RE
199-D5-153	30.2	31.2	RUM Reworked
199-D5-153	31.2	33.2	RUM
199-D5-154	0	15.2	Hanford
199-D5-154	15.2	30.5	RE
199-D5-154	30.5	32.2	RUM Reworked
199-D5-154	32.2	35	RUM
199-D5-158	9.7	10	RUM
199-D5-16	0	16.8	Hanford
199-D5-16	16.8	29.9	RE
199-D5-17	0	23.8	Hanford
199-D5-17	23.8	31.6	RE
199-D5-17	31.6	35.1	RUM
199-D5-18	0	15.2	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D5-18	15.2	30	RE
199-D5-18	30	30.2	RUM Reworked
199-D5-18	30.2	30.6	RUM
199-D5-19	28.7	28.8	RUM Reworked
199-D5-19	28.8	29	RUM
199-D5-20	0	16.8	Hanford
199-D5-20	16.8	30.5	RE
199-D5-20	30.5	30.8	RUM Reworked
199-D5-20	30.8	31.5	RUM
199-D5-32	0	14.9	Hanford
199-D5-32	14.9	32	RE
199-D5-32	32	32.2	RUM
199-D5-33	0	16.8	Hanford
199-D5-33	16.8	31.1	RE
199-D5-33	31.1	31.4	RUM Reworked
199-D5-33	31.4	31.8	RUM
199-D5-34	0	16.5	Hanford
199-D5-34	16.5	32	RE
199-D5-34	32	32.8	RUM
199-D5-36	0	14.3	Hanford
199-D5-36	14.3	29.3	RE
199-D5-36	29.3	29.9	RUM Reworked
199-D5-36	29.9	31.4	RUM
199-D5-37	0	14	Hanford
199-D5-37	14	28.7	RE
199-D5-37	28.7	28.8	RUM Reworked
199-D5-37	28.8	30.3	RUM
199-D5-38	0	15.2	Hanford
199-D5-38	15.2	16.5	RE Reworked
199-D5-38	16.5	31.7	RE
199-D5-38	31.7	32	RUM Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D5-38	32	33.5	RUM
199-D5-39	0	13.7	Hanford
199-D5-39	13.7	15.2	RE Reworked
199-D5-39	15.2	31.4	RE
199-D5-39	31.4	32.9	RUM
199-D5-40	0	22.6	Hanford
199-D5-40	22.6	30.3	RE
199-D5-40	30.3	32.3	RUM Reworked
199-D5-40	32.3	33.4	RUM
199-D5-41	0	14.6	Hanford
199-D5-41	14.6	15.2	RE Reworked
199-D5-41	15.2	31.4	RE
199-D5-41	31.4	31.9	RUM Reworked
199-D5-41	31.9	33.4	RUM
199-D5-42	0	13.7	Hanford
199-D5-42	13.7	14.6	RE Reworked
199-D5-42	14.6	32.3	RE
199-D5-42	32.3	33.4	RUM
199-D5-43	0	14.5	Hanford
199-D5-43	14.5	32.6	RE
199-D5-43	32.6	34.3	RUM
199-D5-44	0	12.2	Hanford
199-D5-44	12.2	14.5	RE Reworked
199-D5-44	14.5	28.4	RE
199-D5-44	28.4	29	RUM Reworked
199-D5-44	29	30.5	RUM
199-D5-92	0	16.8	Hanford
199-D5-92	16.8	29.9	RE
199-D5-92	29.9	30.2	RUM
199-D5-93	0	20.4	Hanford
199-D5-93	20.4	33.2	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D5-98	0	17.4	Hanford
199-D5-98	17.4	32.9	RE
199-D5-98	32.9	33.5	RUM Reworked
199-D5-98	33.5	34.6	RUM
199-D5-99	33.4	35.1	RUM
199-D6-1	0	18.9	Hanford
199-D6-1	18.9	30.8	RE
199-D6-1	30.8	32.6	RUM
199-D6-2	0	13.4	Hanford
199-D6-2	13.4	22.3	RE
199-D6-2	22.3	23.5	RUM Reworked
199-D6-2	23.5	24.5	RUM
199-D6-3	0	18.3	Hanford
199-D6-3	18.3	31	RE
199-D6-3	31	33.7	RUM
199-D7-3	0	25	Hanford
199-D7-3	25	26.2	RUM Reworked
199-D7-3	26.2	27.2	RUM
199-D7-4	0	10.4	Hanford
199-D7-4	10.4	22.6	RE
199-D7-4	22.6	23.6	RUM
199-D7-5	0	16.5	Hanford
199-D7-5	16.5	17.4	RUM Reworked
199-D7-5	17.4	19.4	RUM
199-D7-6	0	6.1	Hanford
199-D7-6	6.1	11.1	RE
199-D7-6	11.1	13.4	RUM
199-D8-4	0	15.2	Hanford
199-D8-4	15.2	31.1	RE
199-D8-4	31.1	31.7	RUM Reworked
199-D8-4	31.7	31.8	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D8-5	0	13.5	Hanford
199-D8-5	13.5	24.4	RE
199-D8-5	24.4	25.3	RUM Reworked
199-D8-5	25.3	26.6	RUM
199-D8-53	20.3	21	RUM Reworked
199-D8-53	21	21.2	RUM
199-D8-54A	23.2	23.8	RUM
199-D8-54B	23.2	43.9	RUM
199-D8-55	0	10.7	Hanford
199-D8-55	10.7	21	RE
199-D8-55	21	21.3	RUM Reworked
199-D8-55	21.3	22.6	RUM
199-D8-68	22.3	22.9	RUM Reworked
199-D8-68	22.9	24.4	RUM
199-D8-69	17.5	18.9	RUM
199-D8-70	21.6	22.6	RUM
199-D8-71	23.2	23.5	RUM Reworked
199-D8-71	23.5	24.7	RUM
199-D8-72	0	15.7	Hanford
199-D8-72	15.7	23.5	RE
199-D8-72	23.5	28.5	RUM Reworked
199-D8-72	28.5	29	RUM
199-D8-73	0	16	Hanford
199-D8-73	16	27.3	RE
199-D8-73	27.3	28.2	RUM
199-D8-88	0	15.1	Hanford
199-D8-88	15.1	15.9	RE Reworked
199-D8-88	15.9	26.5	RE
199-D8-88	26.5	29.3	RUM Reworked
199-D8-88	29.3	29.8	RUM
199-D8-89	0	15.2	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D8-89	15.2	15.9	RE Reworked
199-D8-89	15.9	23.5	RE
199-D8-89	23.5	23.8	RUM Reworked
199-D8-89	23.8	25.9	RUM
199-D8-90	0	15.5	Hanford
199-D8-90	15.5	17.2	RUM
199-D8-91	0	12.2	Hanford
199-D8-91	12.2	12.8	RUM Reworked
199-D8-91	12.8	14.2	RUM
199-D8-93	0	4.9	Hanford
199-D8-93	4.9	6.4	RUM
199-D8-94	0	8	Hanford
199-D8-94	8	9.5	RUM
199-D8-95	0	16.8	Hanford
199-D8-95	16.8	17.7	RE Reworked
199-D8-95	17.7	29.6	RE
199-D8-95	29.6	30.8	RUM Reworked
199-D8-95	30.8	31.8	RUM
199-D8-96	0	15.2	Hanford
199-D8-96	15.2	27.7	RE
199-D8-96	27.7	29.6	RUM Reworked
199-D8-96	29.6	30.9	RUM
199-D8-97	0	20.7	Hanford
199-D8-97	20.7	28.7	RE
199-D8-97	28.7	29.9	RUM Reworked
199-D8-97	29.9	31.8	RUM
199-D8-98	0	25.9	Hanford
199-D8-98	25.9	27.9	RUM
199-D8-99	0	17.4	Hanford
199-D8-99	17.4	24.7	RE
199-D8-99	24.7	25.6	RUM Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D8-99	25.6	27.1	RUM
199-F2-3	0	14.2	Hanford
199-F2-3	14.2	14.6	RUM
199-F5-1	18.3	18.9	RUM Reworked
199-F5-1	18.9	20.4	RUM
199-F5-2	0	22.9	Hanford
199-F5-2	22.9	23.2	RE
199-F5-2	23.2	25.9	RUM Reworked
199-F5-2	25.9	30.5	RUM
199-F5-3	0	22.3	Hanford
199-F5-3	22.3	27.4	RE
199-F5-3	27.4	27.5	RUM
199-F5-4	0	14.9	Hanford
199-F5-4	14.9	22.9	RUM Reworked
199-F5-4	22.9	35.1	RUM
199-F5-43A	0	14.5	Hanford
199-F5-43A	14.5	15.2	RUM
199-F5-43B	0	13.1	Hanford
199-F5-43B	13.1	57.9	RUM
199-F5-45	0	15.5	Hanford
199-F5-45	15.5	15.7	RUM Reworked
199-F5-45	15.7	16	RUM
199-F5-46	0	17.1	Hanford
199-F5-46	17.1	17.2	RUM Reworked
199-F5-46	17.2	17.4	RUM
199-F5-47	0	3.7	Hanford
199-F5-47	3.7	7.9	RE Reworked
199-F5-47	7.9	19.1	RE
199-F5-47	19.1	19.4	RUM
199-F5-48	0	5.5	Hanford
199-F5-48	5.5	7.6	RE Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-F5-48	7.6	15.9	RE
199-F5-48	15.9	16.3	RUM Reworked
199-F5-48	16.3	16.8	RUM
199-F5-49	0	10.9	Hanford
199-F5-5	0	22	Hanford
199-F5-5	22	22.9	RUM Reworked
199-F5-5	22.9	30.5	RUM
199-F5-52	0	20.1	Hanford
199-F5-52	20.1	22.5	RUM
199-F5-53	0	9.5	Hanford
199-F5-53	9.5	16.6	RE Reworked
199-F5-53	16.6	20.7	RUM Reworked
199-F5-53	20.7	35.4	RUM
199-F5-54	0	21.3	Hanford
199-F5-54	21.3	21.6	RUM Reworked
199-F5-54	21.6	23.6	RUM
199-F5-55	0	15.2	Hanford
199-F5-56	7	15.5	RE Reworked
199-F5-6	0	10.4	Hanford
199-F5-6	10.4	21	RE Reworked
199-F5-6	21	58.5	RUM
199-F6-1	15.2	16.2	RUM
199-F7-1	7.3	9.1	RUM Reworked
199-F7-1	9.1	45.7	RUM
199-F7-3	0	5.2	Hanford
199-F7-3	5.2	8.5	RE
199-F7-3	8.5	8.8	RUM Reworked
199-F7-3	8.8	10.1	RUM
199-F8-1	0	7.6	Hanford
199-F8-1	7.6	13.7	RE
199-F8-1	13.7	17.4	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-F8-3	9.1	10.4	RUM
199-F8-4	14.2	14.5	RUM
199-F8-7	9.8	10.7	RUM
199-H1-1	0	7.9	Hanford
199-H1-1	7.9	10.3	RE
199-H1-1	10.3	12.5	RUM Reworked
199-H1-2	0	13.9	Hanford
199-H1-2	13.9	14.6	RUM Reworked
199-H1-2	14.6	16.6	RUM
199-H1-20	0	11.6	Hanford
199-H1-20	11.6	17.6	RUM
199-H1-21	0	4.9	Hanford
199-H1-21	4.9	9.8	RE
199-H1-21	9.8	10.4	RUM Reworked
199-H1-21	10.4	12.1	RUM
199-H1-25	9.8	10.4	RUM Reworked
199-H1-25	10.4	12	RUM
199-H1-27	0	10.7	Hanford
199-H1-27	10.7	11	RUM Reworked
199-H1-27	11	12.6	RUM
199-H1-3	14.2	14.8	RUM
199-H1-32	13.1	13.7	RUM Reworked
199-H1-32	13.7	15.7	RUM
199-H1-33	11.9	13.7	RUM
199-H1-34	11.6	13.7	RUM
199-H1-35	12.5	13.1	RUM Reworked
199-H1-35	13.1	14.6	RUM
199-H1-36	0	7.6	Hanford
199-H1-36	7.6	9.1	RE Reworked
199-H1-36	9.1	11.9	RE
199-H1-36	11.9	14.2	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-H1-37	0	12.5	Hanford
199-H1-37	12.5	13.1	RUM Reworked
199-H1-37	13.1	14.1	RUM
199-H1-38	0	12.8	Hanford
199-H1-38	12.8	13.7	RUM Reworked
199-H1-38	13.7	14.5	RUM
199-H1-39	0	11.6	Hanford
199-H1-39	11.6	12.2	RUM Reworked
199-H1-39	12.2	13.4	RUM
199-H1-4	0	12.5	Hanford
199-H1-4	12.5	14.8	RUM
199-H1-40	0	11.7	Hanford
199-H1-40	11.7	13.5	RUM
199-H1-42	0	8.5	Hanford
199-H1-42	8.5	11	RE Reworked
199-H1-42	11	11.9	RE
199-H1-42	11.9	12.5	RUM Reworked
199-H1-42	12.5	13.4	RUM
199-H1-43	0	13.1	Hanford
199-H1-43	13.1	13.7	RUM Reworked
199-H1-43	13.7	14.9	RUM
199-H1-45	0	12.5	Hanford
199-H1-45	12.5	16.9	RE
199-H1-45	16.9	18.6	RUM
199-H1-5	0	13	Hanford
199-H1-5	13	14.2	RE
199-H1-6	0	11.1	Hanford
199-H1-6	11.1	14.3	RUM
199-H1-7	0	9.6	Hanford
199-H1-7	9.6	11.3	RUM
199-H2-1	0	11.3	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-H2-1	11.3	12.2	RUM Reworked
199-H2-1	12.2	57.6	RUM
199-H3-1	0	17.1	Hanford
199-H3-1	17.1	22.9	RUM
199-H3-10	0	16.8	Hanford
199-H3-10	16.8	70.4	RUM
199-H3-11	0	16.6	Hanford
199-H3-25	0	16.8	Hanford
199-H3-25	16.8	17.1	RUM Reworked
199-H3-25	17.1	18.7	RUM
199-H3-26	0	15.5	Hanford
199-H3-26	15.5	15.9	RUM Reworked
199-H3-26	15.9	17.2	RUM
199-H3-27	0	17.4	Hanford
199-H3-27	17.4	18.9	RUM
199-H3-2A	0	16.5	Hanford
199-H3-2A	16.5	17.1	RUM
199-H3-2B	0	17.4	Hanford
199-H3-2B	17.4	17.7	RUM
199-H3-2C	0	16.8	Hanford
199-H3-2C	16.8	19.5	RUM Reworked
199-H3-2C	19.5	47.2	RUM
199-H3-3	0	14.9	Hanford
199-H3-3	14.9	16.3	RUM
199-H3-4	0	13.7	Hanford
199-H3-4	13.7	14.9	RUM
199-H3-5	0	9.5	Hanford
199-H3-5	9.5	10.1	RE Reworked
199-H3-5	10.1	13.4	RE
199-H3-5	13.4	13.9	RUM Reworked
199-H3-5	13.9	15.2	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-H3-6	0	16.6	Hanford
199-H3-6	16.6	18.8	RUM
199-H3-7	0	16	Hanford
199-H3-7	16	18	RUM
199-H3-9	0	13.1	Hanford
199-H3-9	13.1	18.3	RUM Reworked
199-H3-9	18.3	66.5	RUM
199-H4-1	16.8	22.9	RUM
199-H4-10	11.6	11.7	RUM
199-H4-11	17.4	18	RUM Reworked
199-H4-11	18	18.1	RUM
199-H4-12A	15.2	15.3	RUM Reworked
199-H4-12B	15.2	15.5	RUM Reworked
199-H4-12C	0	14.9	Hanford
199-H4-12C	14.9	15.2	RE Reworked
199-H4-12C	15.2	24.4	RE
199-H4-12C	24.4	67.1	RUM
199-H4-13	16.5	18	RUM Reworked
199-H4-13	18	18.6	RUM
199-H4-14	16.5	18	RUM Reworked
199-H4-14	18	18.1	RUM
199-H4-15A	12.5	13.4	RUM Reworked
199-H4-15A	13.4	14	RUM
199-H4-15B	13.1	13.4	RUM
199-H4-15C	13.4	14	RUM Reworked
199-H4-16	0	18.3	Hanford
199-H4-16	18.3	18.6	RUM Reworked
199-H4-16	18.6	18.7	RUM
199-H4-17	0	13.4	Hanford
199-H4-17	13.4	13.7	RUM Reworked
199-H4-17	13.7	13.8	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-H4-18	0	14.9	Hanford
199-H4-18	14.9	15.2	RUM Reworked
199-H4-18	15.2	15.5	RUM
199-H4-2	18	109.723	RUM
199-H4-3	0	15.2	Hanford
199-H4-3	15.2	17.6	RE
199-H4-46	18.6	18.8	RUM
199-H4-48	0	12.2	Hanford
199-H4-48	12.2	18.9	RE
199-H4-48	18.9	19	RUM
199-H4-49	16.8	17.5	RUM Reworked
199-H4-49	17.5	18.3	RUM
199-H4-5	14.6	18.3	RUM
199-H4-63	0	9.8	Hanford
199-H4-63	9.8	11	RE Reworked
199-H4-63	11	17.2	RE
199-H4-63	17.2	17.4	RUM Reworked
199-H4-63	17.4	19.5	RUM
199-H4-64	0	10.7	Hanford
199-H4-64	10.7	14.6	RE
199-H4-64	14.6	17.2	RUM
199-H4-65	15.2	16.2	RUM
199-H4-69	0	17.7	Hanford
199-H4-69	17.7	18.3	RUM Reworked
199-H4-69	18.3	19.5	RUM
199-H4-7	16.5	16.8	RUM
199-H4-70	0	17.1	Hanford
199-H4-70	17.1	18.7	RUM
199-H4-71	0	18.9	Hanford
199-H4-71	18.9	21.6	RUM
199-H4-72	0	17.1	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-H4-72	17.1	18.7	RUM
199-H4-73	0	18.9	Hanford
199-H4-73	18.9	21.3	RUM Reworked
199-H4-73	21.3	21.6	RUM
199-H4-74	0	9.1	Hanford
199-H4-74	9.1	11.6	RE
199-H4-74	11.6	13	RUM Reworked
199-H4-74	13	14	RUM
199-H4-75	0	12.2	Hanford
199-H4-75	12.2	15.2	RE
199-H4-75	15.2	18	RUM
199-H4-76	13.7	15.2	RUM Reworked
199-H4-76	15.2	17.2	RUM
199-H4-77	0	13	Hanford
199-H4-77	13	15.5	RUM
199-H4-78	0	2.6	Hanford
199-H4-78	2.6	17.8	RE
199-H4-78	17.8	19.5	RUM
199-H4-79	0	13.4	Hanford
199-H4-79	13.4	16.2	RE
199-H4-79	16.2	18.1	RUM Reworked
199-H4-79	18.1	19.8	RUM
199-H4-8	14.6	16.8	RUM
199-H4-80	0	12.2	Hanford
199-H4-80	12.2	20.4	RE
199-H4-80	20.4	21.3	RUM Reworked
199-H4-80	21.3	22.7	RUM
199-H4-81	0	8.2	Hanford
199-H4-81	8.2	11.9	RE
199-H4-81	11.9	13.5	RUM
199-H4-82	0	16.2	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-H4-82	16.2	18	RUM
199-H4-83	0	14.8	Hanford
199-H4-84	0	12.9	Hanford
199-H4-85	0	10.7	Hanford
199-H4-85	10.7	14.5	RE
199-H4-85	14.5	16	RUM
199-H4-86	0	13	Hanford
199-H4-86	13	13.7	RE Reworked
199-H4-86	13.7	18.4	RE
199-H4-86	18.4	18.9	RUM Reworked
199-H4-86	18.9	20.2	RUM
199-H4-9	13.1	14.2	RUM Reworked
199-H4-9	14.2	15.5	RUM
199-H4-90	0	18.3	Hanford
199-H4-90	18.3	19.2	RUM Reworked
199-H4-90	19.2	29.7	RUM
199-H4-91	16.5	17.2	RUM Reworked
199-H4-91	17.2	28.8	RUM
199-H5-1A	15.9	17.4	RUM
199-H6-2	0	13.7	Hanford
199-H6-2	13.7	15.5	RE
199-H6-2	15.5	16.8	RUM Reworked
199-H6-2	16.8	18.5	RUM
199-H6-3	0	18.3	Hanford
199-H6-3	18.3	20.5	RUM
199-H6-4	0	7.3	Hanford
199-H6-4	7.3	10.1	RE Reworked
199-H6-4	10.1	16.8	RE
199-H6-4	16.8	17.4	RUM Reworked
199-H6-4	17.4	19.2	RUM
199-K-10	0	14.3	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-10	14.3	50	RE
199-K-10	50	52.1	RUM
199-K-106A	0	6.4	Hanford
199-K-106A	6.4	49.5	RE
199-K-106A	49.5	57.9	RUM
199-K-107A	0	5.8	Hanford
199-K-107A	5.8	29	RE
199-K-108A	0	9.1	Hanford
199-K-108A	9.1	28.5	RE
199-K-109A	0	11.7	Hanford
199-K-109A	11.7	47.2	RE
199-K-109A	47.2	50.6	RUM Reworked
199-K-11	0	13.7	Hanford
199-K-11	13.7	50.3	RE
199-K-11	50.3	51.8	RUM
199-K-110A	0	10.8	Hanford
199-K-110A	10.8	28.4	RE
199-K-111A	0	7.9	Hanford
199-K-111A	7.9	47.3	RE
199-K-111A	47.3	56.4	RUM
199-K-112A	0	7.9	Hanford
199-K-112A	7.9	14.6	RE
199-K-112A	14.6	16.5	RUM
199-K-113A	0	6.7	Hanford
199-K-113A	6.7	12.5	RE
199-K-113A	12.5	14.6	RUM
199-K-114A	0	6.4	Hanford
199-K-114A	6.4	7.3	RE Reworked
199-K-114A	7.3	12.5	RE
199-K-114A	12.5	15.5	RUM
199-K-115A	0	4.9	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-115A	4.9	16.5	RE
199-K-115A	16.5	18.6	RUM
199-K-116A	0	11.6	Hanford
199-K-116A	11.6	26.5	RE
199-K-116A	26.5	28.2	RUM
199-K-117A	0	4.3	Hanford
199-K-117A	4.3	20.7	RE
199-K-117A	20.7	22.3	RUM
199-K-118A	0	5.8	Hanford
199-K-118A	5.8	23	RE
199-K-118A	23	24.7	RUM
199-K-119A	0	4.9	Hanford
199-K-119A	4.9	27.1	RE
199-K-119A	27.1	28	RUM
199-K-120A	0	0.9	Hanford
199-K-120A	0.9	29.3	RE
199-K-120A	29.3	30.8	RUM
199-K-121A	0	16.5	Hanford
199-K-121A	16.5	30.1	RE
199-K-122A	0	11.9	Hanford
199-K-122A	11.9	30.5	RE
199-K-122A	30.5	30.8	RUM
199-K-123A	0	11.6	Hanford
199-K-123A	11.6	29.9	RE
199-K-124A	0	11	Hanford
199-K-124A	11	30.8	RE
199-K-125A	0	8.8	Hanford
199-K-125A	8.8	22.9	RE
199-K-125A	22.9	23.8	RUM
199-K-126	0	12.8	Hanford
199-K-126	12.8	27.4	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-127	0	8.5	Hanford
199-K-127	8.5	31.4	RE
199-K-128	0	13.7	Hanford
199-K-128	13.7	29.9	RE
199-K-128	29.9	30.2	RUM
199-K-129	0	7.3	Hanford
199-K-129	7.3	14.6	RE
199-K-129	14.6	15.1	RUM
199-K-130	0	8.5	Hanford
199-K-130	8.5	24.1	RE
199-K-131	0	9.1	Hanford
199-K-131	9.1	29.9	RE
199-K-131	29.9	30.3	RUM
199-K-132	0	8.2	Hanford
199-K-132	8.2	26.8	RE
199-K-133	0	15.7	Hanford
199-K-133	15.7	30.2	RE
199-K-134	0	18.3	Hanford
199-K-134	18.3	30.2	RE
199-K-135	0	15.2	Hanford
199-K-135	15.2	34.6	RE
199-K-135	34.6	34.9	RUM
199-K-136	0	14.9	Hanford
199-K-136	14.9	31.7	RE
199-K-138	0	9.1	Hanford
199-K-138	9.1	29.9	RE
199-K-141	0	10.7	Hanford
199-K-141	10.7	13.4	RE Reworked
199-K-141	13.4	34.7	RE
199-K-142	0	10.1	Hanford
199-K-142	10.1	35.3	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-143	0	8.2	Hanford
199-K-143	8.2	29	RE
199-K-144	0	3.4	Hanford
199-K-144	3.4	29	RE
199-K-144	29	29.6	RUM Reworked
199-K-144	29.6	32.6	RUM
199-K-145	0	1.2	Hanford
199-K-145	1.2	36	RE
199-K-145	36	37.7	RUM
199-K-146	0	8.2	Hanford
199-K-146	8.2	16.2	RE
199-K-146	16.2	17.7	RUM
199-K-147	0	8.2	Hanford
199-K-147	8.2	23.5	RE
199-K-147	23.5	24.1	RUM Reworked
199-K-147	24.1	25.6	RUM
199-K-148	0	13.7	Hanford
199-K-148	13.7	15.2	RE Reworked
199-K-148	15.2	30.5	RE
199-K-148	30.5	33.2	RUM
199-K-149	0	16.2	Hanford
199-K-149	16.2	32.3	RE
199-K-149	32.3	34.5	RUM
199-K-150	0	16.5	Hanford
199-K-150	16.5	34.1	RE
199-K-150	34.1	35.8	RUM
199-K-151	0	15.2	Hanford
199-K-151	15.2	35.1	RE
199-K-151	35.1	36.2	RUM
199-K-152	0	16.8	Hanford
199-K-152	16.8	35.4	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-152	35.4	36.2	RUM
199-K-153	0	12.2	Hanford
199-K-153	12.2	13.7	RE Reworked
199-K-153	13.7	30.5	RE
199-K-153	30.5	31.9	RUM
199-K-154	0	12.2	Hanford
199-K-154	12.2	31.1	RE
199-K-154	31.1	32.9	RUM
199-K-155	0	9.9	Hanford
199-K-156	0	9.1	Hanford
199-K-156	9.1	50.6	RE
199-K-156	50.6	52.5	RUM
199-K-157	0	8.2	Hanford
199-K-157	8.2	42.4	RE
199-K-157	42.4	43.7	RUM
199-K-159	0	15.2	Hanford
199-K-159	15.2	22.9	RE Reworked
199-K-159	22.9	33.5	RE
199-K-159	33.5	35.7	RUM
199-K-160	0	16.8	Hanford
199-K-160	16.8	22.9	RE Reworked
199-K-160	22.9	34.4	RE
199-K-160	34.4	36	RUM
199-K-161	0	8.5	Hanford
199-K-161	8.5	14.9	RE
199-K-161	14.9	15.5	RUM Reworked
199-K-161	15.5	17.2	RUM
199-K-162	0	9.1	Hanford
199-K-162	9.1	39	RE
199-K-162	39	40.7	RUM
199-K-163	0	12.2	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-163	12.2	33.5	RE
199-K-163	33.5	34.7	RUM
199-K-164	0	19.8	Hanford
199-K-164	19.8	34.1	RE
199-K-164	34.1	36.3	RUM
199-K-165	0	8.8	Hanford
199-K-165	8.8	52.4	RE
199-K-165	52.4	53.6	RUM Reworked
199-K-165	53.6	54.9	RUM
199-K-166	0	8.2	Hanford
199-K-166	8.2	50.6	RE
199-K-166	50.6	51.3	RUM Reworked
199-K-166	51.3	52	RUM
199-K-167	0	11.3	Hanford
199-K-168	0	8.5	Hanford
199-K-168	8.5	13.1	RE Reworked
199-K-168	13.1	46.9	RE
199-K-168	46.9	48.8	RUM Reworked
199-K-168	48.8	50.8	RUM
199-K-169	0	21.3	Hanford
199-K-169	21.3	40.2	RE
199-K-169	40.2	43.3	RUM
199-K-170	0	13.7	Hanford
199-K-170	13.7	43.6	RE
199-K-170	43.6	45.4	RUM Reworked
199-K-170	45.4	46	RUM
199-K-171	0	18.3	Hanford
199-K-171	18.3	19.8	RE Reworked
199-K-171	19.8	45.1	RE
199-K-171	45.1	46.8	RUM
199-K-172	0	18.3	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-172	18.3	19.8	RE Reworked
199-K-172	19.8	40.2	RE
199-K-172	40.2	42.7	RUM
199-K-173	19.8	53.2	RE
199-K-173	53.2	55.2	RUM
199-K-174	0	15.2	Hanford
199-K-174	15.2	40.4	RE
199-K-175	0	21.3	Hanford
199-K-175	21.3	45.3	RE
199-K-178	0	9.1	Hanford
199-K-178	9.1	10.7	RE Reworked
199-K-178	10.7	39.3	RE
199-K-178	39.3	40.5	RUM Reworked
199-K-178	40.5	40.7	RUM
199-K-179	0	12.2	Hanford
199-K-179	12.2	43	RE
199-K-179	43	43.3	RUM Reworked
199-K-179	43.3	44.5	RUM
199-K-180	0	19.8	Hanford
199-K-180	19.8	46.3	RE
199-K-180	46.3	47.2	RUM Reworked
199-K-180	47.2	47.5	RUM
199-K-181	0	6.1	Hanford
199-K-181	6.1	39.9	RE
199-K-181	39.9	41.5	RUM
199-K-182	0	15.2	Hanford
199-K-182	15.2	37.5	RE
199-K-182	37.5	38.7	RUM
199-K-183	0	7	Hanford
199-K-183	7	10.2	RE Reworked
199-K-183	10.2	44.2	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-183	44.2	45	RUM Reworked
199-K-183	45	46.5	RUM
199-K-184	49.6	65.9	RUM
199-K-185	0	13.1	Hanford
199-K-185	13.1	40.7	RE
199-K-185	40.7	42.2	RUM
199-K-186	0	14.2	Hanford
199-K-186	14.2	19.5	RE Reworked
199-K-186	19.5	49.4	RE
199-K-186	49.4	50.9	RUM
199-K-187	0	20.9	Hanford
199-K-187	20.9	60.2	RE
199-K-187	60.2	61.7	RUM
199-K-188	0	18.3	Hanford
199-K-188	18.3	55.8	RE
199-K-188	55.8	71.6	RUM
199-K-189	0	11	Hanford
199-K-189	11	46.9	RE
199-K-189	46.9	47.6	RUM Reworked
199-K-189	47.6	48.5	RUM
199-K-190	0	8.8	Hanford
199-K-190	8.8	40.5	RE
199-K-190	40.5	42.1	RUM
199-K-191	0	12.5	Hanford
199-K-191	12.5	12.8	RE Reworked
199-K-191	12.8	46.7	RE
199-K-191	46.7	48.2	RUM
199-K-193	0	14	Hanford
199-K-193	14	49.1	RE
199-K-193	49.1	50.6	RUM
199-K-194	0	18.3	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-194	18.3	19.8	RE Reworked
199-K-194	19.8	43.1	RE
199-K-194	43.1	44.9	RUM
199-K-195	0	14.6	Hanford
199-K-195	14.6	15.2	RE Reworked
199-K-195	15.2	54.3	RE
199-K-195	54.3	70.3	RUM
199-K-196	0	9.8	Hanford
199-K-196	9.8	10.7	RE Reworked
199-K-196	10.7	40.4	RE
199-K-196	40.4	42.6	RUM
199-K-197	0	30.8	RE
199-K-197	30.8	33	RUM
199-K-198	0	28.04	RE
199-K-198	28.04	28.53	RUM Reworked
199-K-198	28.53	30.94	RUM
199-K-199	0	29.4	RE
199-K-199	29.4	31.4	RUM
199-K-200	0	10.1	Hanford
199-K-200	10.1	18.1	RE
199-K-201	0	7.9	Hanford
199-K-201	7.9	18.4	RE
199-K-202	0	12.2	Hanford
199-K-202	12.2	46.9	RE
199-K-202	46.9	48.8	RUM
199-K-203	0	9.1	Hanford
199-K-203	9.1	10.4	RE Reworked
199-K-203	10.4	47.5	RE
199-K-203	47.5	49.3	RUM
199-K-204	0	7	Hanford
199-K-204	7	42.7	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-204	42.7	47.9	RUM Reworked
199-K-204	47.9	49.7	RUM
199-K-205	0	15.5	Hanford
199-K-205	15.5	17.1	RE Reworked
199-K-205	17.1	54.9	RE
199-K-205	54.9	55.5	RUM Reworked
199-K-205	55.5	56.7	RUM
199-K-206	0	20.1	Hanford
199-K-206	20.1	53.6	RE
199-K-206	53.6	55.8	RUM
199-K-21	0	7.6	Hanford
199-K-21	7.6	15.2	RE
199-K-210	0	5.2	Hanford
199-K-210	5.2	35.5	RE
199-K-210	35.5	37.2	RUM
199-K-212	0	4	Hanford
199-K-212	4	23.5	RE
199-K-212	23.5	26.2	RUM
199-K-22	0	7	Hanford
199-K-22	7	15.2	RE
199-K-220	0	16.8	Hanford
199-K-220	16.8	18.3	RE Reworked
199-K-220	18.3	50.2	RE
199-K-220	50.2	52.2	RUM
199-K-29	0	12.2	Hanford
199-K-29	12.2	27.4	RE
199-K-30	0	12.2	Hanford
199-K-30	12.2	27.4	RE
199-K-32A	0	8.2	Hanford
199-K-32A	8.2	21	RE
199-K-32B	0	11	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-32B	11	41.5	RE
199-K-32B	41.5	53.6	RUM
199-K-34	0	6.7	Hanford
199-K-34	6.7	27.6	RE
199-K-35	0	23.5	Hanford
199-K-35	23.5	35.7	RE
199-K-36	0	18.9	Hanford
199-K-36	18.9	27.6	RE
199-K-37	0	9.3	Hanford
199-K-37	9.3	21.1	RE
199-N-104A	0	17.4	Hanford
199-N-104A	17.4	27.9	RE
199-N-105A	0	13.1	Hanford
199-N-105A	13.1	28	RE
199-N-105A	28	29.3	RUM Reworked
199-N-105A	29.3	29.9	RUM
199-N-106A	0	17.7	Hanford
199-N-106A	17.7	36.3	RE
199-N-106A	36.3	36.9	RUM
199-N-107A	0	11.6	Hanford
199-N-107A	11.6	12.8	RE Reworked
199-N-107A	12.8	23.2	RE
199-N-109A	0	13.4	Hanford
199-N-109A	13.4	19.7	RE
199-N-121	0	2.4	Hanford
199-N-121	2.4	12.5	RE
199-N-121	12.5	13	RUM
199-N-122	0	4.3	Hanford
199-N-122	4.3	13.6	RE
199-N-122	13.6	14.6	RUM
199-N-123	0	3.5	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-123	3.5	16.1	RE
199-N-123	16.1	16.5	RUM
199-N-136	0	3.7	Hanford
199-N-136	3.7	7.9	RE
199-N-137	0	3.7	Hanford
199-N-137	3.7	7.9	RE
199-N-142	0	4.3	Hanford
199-N-142	4.3	7.8	RE
199-N-143	0	3.1	Hanford
199-N-143	3.1	7.9	RE
199-N-144	0	4.3	Hanford
199-N-144	4.3	7.8	RE
199-N-145	0	3.1	Hanford
199-N-145	3.1	7.9	RE
199-N-160	0	4.6	Hanford
199-N-160	4.6	7.9	RE
199-N-161	0	4.3	Hanford
199-N-161	4.3	7.7	RE
199-N-162	0	4.6	Hanford
199-N-162	4.6	7.9	RE
199-N-163	0	4.3	Hanford
199-N-163	4.3	7.9	RE
199-N-164	0	4	Hanford
199-N-164	4	7.7	RE
199-N-167	0	14.9	Hanford
199-N-167	14.9	25.3	RE
199-N-169	0	13.1	Hanford
199-N-169	13.1	25.3	RE
199-N-170	0	12.8	Hanford
199-N-170	12.8	25.5	RE
199-N-171	0	13.7	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-171	13.7	15.4	RE Reworked
199-N-171	15.4	25.6	RE
199-N-172	0	13.4	Hanford
199-N-172	13.4	25	RE
199-N-173	0	2.7	Hanford
199-N-173	2.7	13.7	RE
199-N-173	13.7	13.8	RUM
199-N-174	0	4.3	Hanford
199-N-174	4.3	6.3	RE
199-N-176	0	4.9	Hanford
199-N-176	4.9	5.7	RE
199-N-177	0	4.4	Hanford
199-N-177	4.4	5.6	RE
199-N-178	0	4.9	Hanford
199-N-178	4.9	5.7	RE
199-N-179	0	6.1	Hanford
199-N-180	0	4.7	Hanford
199-N-180	4.7	5.7	RE
199-N-181	0	2	Hanford
199-N-181	2	4.6	RE Reworked
199-N-181	4.6	5.9	RE
199-N-182	0	14	Hanford
199-N-182	14	17.4	RE Reworked
199-N-182	17.4	31.1	RE
199-N-182	31.1	46.9	RUM
199-N-183	0	15.2	Hanford
199-N-183	15.2	16.8	RE Reworked
199-N-183	16.8	33.3	RE
199-N-183	33.3	35.8	RUM
199-N-184	0	16.8	Hanford
199-N-184	16.8	18.3	RE Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-184	18.3	30.5	RE
199-N-184	30.5	30.8	RUM Reworked
199-N-184	30.8	32.9	RUM
199-N-186	0	15.2	Hanford
199-N-186	15.2	28.4	RE
199-N-186	28.4	29.7	RUM Reworked
199-N-187	0	12.2	Hanford
199-N-187	12.2	15.2	RE Reworked
199-N-187	15.2	28.8	RE
199-N-188	0	9.1	Hanford
199-N-188	9.1	27.4	RE
199-N-189	0	15.2	Hanford
199-N-189	15.2	18	RE Reworked
199-N-189	18	32	RE
199-N-189	32	32.6	RUM Reworked
199-N-189	32.6	35.8	RUM
199-N-2	0	10.7	Hanford
199-N-2	10.7	30.5	RE
199-N-2	30.5	32	RUM Reworked
199-N-2	32	38.1	RUM
199-N-200	0	0.2	Hanford
199-N-200	0.2	5.5	RE
199-N-203	0	0.2	Hanford
199-N-203	0.2	3.1	RE Reworked
199-N-203	3.1	8.3	RE
199-N-205	0	0.2	Hanford
199-N-205	0.2	2.3	RE Reworked
199-N-205	2.3	8	RE
199-N-206	0	0.2	Hanford
199-N-206	0.2	2.1	RE Reworked
199-N-206	2.1	5.4	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-207	0	0.2	Hanford
199-N-207	0.2	8.2	RE
199-N-208	0	0.2	Hanford
199-N-208	0.2	2.4	RE Reworked
199-N-208	2.4	4.9	RE
199-N-209	0	2.6	Hanford
199-N-209	2.6	8	RE
199-N-210	0	0.6	Hanford
199-N-210	0.6	5	RE
199-N-211	0	0.6	Hanford
199-N-211	0.6	1.8	RE Reworked
199-N-211	1.8	8	RE
199-N-212	0	2.1	Hanford
199-N-212	2.1	4.9	RE
199-N-213	0	2.4	Hanford
199-N-213	2.4	8	RE
199-N-214	0	0.3	Hanford
199-N-214	0.3	3.1	RE Reworked
199-N-214	3.1	4.9	RE
199-N-215	0	1.8	Hanford
199-N-215	1.8	8.3	RE
199-N-220	0	4.6	Hanford
199-N-220	4.6	8	RE
199-N-221	0	3.7	Hanford
199-N-221	3.7	8.2	RE
199-N-223	0	1.8	Hanford
199-N-223	1.8	8.1	RE
199-N-224	0	1.8	Hanford
199-N-224	1.8	5.3	RE
199-N-225	0	1.8	Hanford
199-N-225	1.8	8.2	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-226	0	4.9	Hanford
199-N-227	0	0.6	Hanford
199-N-227	0.6	8.4	RE
199-N-228	0	0.3	Hanford
199-N-228	0.3	4.3	RE Reworked
199-N-228	4.3	4.9	RE
199-N-231	0	0.3	Hanford
199-N-231	0.3	4	RE Reworked
199-N-231	4	8	RE
199-N-232	0	3.1	Hanford
199-N-232	3.1	5	RE
199-N-234	0	0.9	Hanford
199-N-234	0.9	2.4	RE Reworked
199-N-234	2.4	5.1	RE
199-N-235	0	0.9	Hanford
199-N-235	0.9	2.7	RE Reworked
199-N-235	2.7	4.9	RE
199-N-236	0	0.6	Hanford
199-N-236	0.6	3.1	RE Reworked
199-N-236	3.1	8.1	RE
199-N-238	0	0.6	Hanford
199-N-238	0.6	4.9	RE Reworked
199-N-238	4.9	8.1	RE
199-N-239	0	3.1	Hanford
199-N-239	3.1	5.2	RE
199-N-241	0	3.1	Hanford
199-N-241	3.1	5	RE
199-N-242	0	0.9	Hanford
199-N-242	0.9	4.4	RE
199-N-243	0	2.4	Hanford
199-N-243	2.4	5.2	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-244	0	0.6	Hanford
199-N-244	0.6	3.7	RE Reworked
199-N-244	3.7	8	RE
199-N-245	0	0.9	Hanford
199-N-245	0.9	5.3	RE
199-N-246	0	3.1	Hanford
199-N-246	3.1	8.2	RE
199-N-247	0	1.5	Hanford
199-N-247	1.5	5.5	RE
199-N-248	0	1.8	Hanford
199-N-248	1.8	8.2	RE
199-N-249	0	0.6	Hanford
199-N-249	0.6	5.2	RE
199-N-250	0	0.6	Hanford
199-N-250	0.6	8.2	RE
199-N-251	0	1.5	Hanford
199-N-251	1.5	5.2	RE
199-N-252	0	1.8	Hanford
199-N-252	1.8	8.1	RE
199-N-254	0	0.6	Hanford
199-N-254	0.6	8.1	RE
199-N-255	0	0.6	Hanford
199-N-255	0.6	5.2	RE
199-N-256	0	0.6	Hanford
199-N-256	0.6	8.3	RE
199-N-262	0	2.1	Hanford
199-N-262	2.1	8	RE
199-N-263	0	0.6	Hanford
199-N-263	0.6	5.4	RE
199-N-264	0	0.6	Hanford
199-N-264	0.6	8.1	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-266	0	0.3	Hanford
199-N-266	0.3	8.2	RE
199-N-267	0	0.3	Hanford
199-N-267	0.3	5.2	RE
199-N-268	0	0.6	Hanford
199-N-268	0.6	8.2	RE
199-N-273	0	0.6	Hanford
199-N-273	0.6	5.4	RE
199-N-275	0	0.9	Hanford
199-N-275	0.9	5.3	RE
199-N-276	0	0.6	Hanford
199-N-276	0.6	8	RE
199-N-277	0	0.6	Hanford
199-N-277	0.6	5.5	RE
199-N-278	0	0.6	Hanford
199-N-278	0.6	8.1	RE
199-N-279	0	0.3	Hanford
199-N-279	0.3	5.4	RE
199-N-281	0	1.2	Hanford
199-N-281	1.2	5.5	RE
199-N-282	0	1.2	Hanford
199-N-282	1.2	8.2	RE
199-N-283	0	1.4	Hanford
199-N-283	1.4	5.4	RE
199-N-284	0	1.2	Hanford
199-N-284	1.2	7.9	RE
199-N-285	0	0.9	Hanford
199-N-285	0.9	5.4	RE
199-N-286	0	1.5	Hanford
199-N-286	1.5	8.4	RE
199-N-287	0	1.2	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-287	1.2	5.4	RE
199-N-288	0	1.4	Hanford
199-N-288	1.4	8.3	RE
199-N-289	0	0.9	Hanford
199-N-289	0.9	5.2	RE
199-N-290	0	0.6	Hanford
199-N-290	0.6	8.4	RE
199-N-292	0	1.2	Hanford
199-N-292	1.2	8.4	RE
199-N-293	0	1.5	Hanford
199-N-293	1.5	5.4	RE
199-N-294	0	1.8	Hanford
199-N-294	1.8	8.3	RE
199-N-295	0	1.8	Hanford
199-N-295	1.8	5.5	RE
199-N-296	0	0.6	Hanford
199-N-296	0.6	3.1	RE Reworked
199-N-296	3.1	8.3	RE
199-N-297	0	2.1	Hanford
199-N-297	2.1	5.5	RE
199-N-298	0	1.5	Hanford
199-N-298	1.5	8.4	RE
199-N-299	0	1.8	Hanford
199-N-299	1.8	5.5	RE
199-N-303	0	0.9	Hanford
199-N-303	0.9	5.2	RE
199-N-305	0	1.8	Hanford
199-N-305	1.8	5.5	RE
199-N-306	0	1.5	Hanford
199-N-306	1.5	8.4	RE
199-N-307	0	0.9	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-307	0.9	5.2	RE
199-N-308	0	0.9	Hanford
199-N-308	0.9	8.2	RE
199-N-309	0	0.6	Hanford
199-N-309	0.6	5.4	RE
199-N-311	0	0.9	Hanford
199-N-311	0.9	5.4	RE
199-N-312	0	1.8	Hanford
199-N-312	1.8	8.5	RE
199-N-313	0	0.6	Hanford
199-N-313	0.6	5.2	RE
199-N-314	0	1.2	Hanford
199-N-314	1.2	8.1	RE
199-N-315	0	0.9	Hanford
199-N-315	0.9	5.3	RE
199-N-318	0	0.6	Hanford
199-N-318	0.6	8.2	RE
199-N-319	0	0.6	Hanford
199-N-319	0.6	5.2	RE
199-N-320	0	0.9	Hanford
199-N-320	0.9	8.3	RE
199-N-321	0	0.9	Hanford
199-N-321	0.9	5.5	RE
199-N-322	0	1.8	Hanford
199-N-322	1.8	8.1	RE
199-N-323	0	0.6	Hanford
199-N-323	0.6	5.2	RE
199-N-324	0	0.6	Hanford
199-N-324	0.6	8.2	RE
199-N-326	0	0.6	Hanford
199-N-326	0.6	8.1	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-327	0	0.6	Hanford
199-N-327	0.6	5.5	RE
199-N-328	0	0.9	Hanford
199-N-328	0.9	7.9	RE
199-N-329	0	0.9	Hanford
199-N-329	0.9	5.1	RE
199-N-330	0	0.9	Hanford
199-N-330	0.9	7.9	RE
199-N-331	0	1.1	Hanford
199-N-331	1.1	5.7	RE
199-N-332	0	0.8	Hanford
199-N-332	0.8	8	RE
199-N-333	0	0.6	Hanford
199-N-333	0.6	5.3	RE
199-N-334	0	0.6	Hanford
199-N-334	0.6	8	RE
199-N-335	0	0.9	Hanford
199-N-335	0.9	5.3	RE
199-N-336	0	1.2	Hanford
199-N-336	1.2	8.2	RE
199-N-337	0	0.9	Hanford
199-N-337	0.9	5.3	RE
199-N-338	0	0.9	Hanford
199-N-338	0.9	8.2	RE
199-N-340	0	0.9	Hanford
199-N-340	0.9	1.8	RE Reworked
199-N-340	1.8	7.3	RE
199-N-340	7.3	7.9	RUM Reworked
199-N-341	0	0.9	Hanford
199-N-341	0.9	5.2	RE
199-N-342	0	0.9	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-342	0.9	3.1	RE Reworked
199-N-342	3.1	8.7	RE
199-N-343	0	0.9	Hanford
199-N-343	0.9	5.3	RE
199-N-344	0	0.6	Hanford
199-N-344	0.6	6.1	RE
199-N-344	6.1	8.4	RUM
199-N-345	0	0.9	Hanford
199-N-345	0.9	5.5	RE
199-N-346	0	2.1	Hanford
199-N-346	2.1	8.2	RE
199-N-347	0	2.1	Hanford
199-N-347	2.1	8.2	RE
199-N-348	0	0.6	Hanford
199-N-348	0.6	1.8	RE Reworked
199-N-348	1.8	8.1	RE
199-N-349	0	0.3	Hanford
199-N-349	0.3	2.7	RE Reworked
199-N-349	2.7	8.1	RE
199-N-350	0	3.5	Hanford
199-N-350	3.5	8.2	RE
199-N-351	0	1.8	Hanford
199-N-351	1.8	8.2	RE
199-N-352	0	0.6	Hanford
199-N-352	0.6	1.2	RE Reworked
199-N-352	1.2	8.2	RE
199-N-353	0	0.6	Hanford
199-N-353	0.6	8.1	RE
199-N-354	0	0.9	Hanford
199-N-354	0.9	8.2	RE
199-N-355	0	0.3	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-355	0.3	8.1	RE
199-N-358	0	1.2	Hanford
199-N-358	1.2	8.1	RE
199-N-360	0	1.8	Hanford
199-N-360	1.8	8.1	RE
199-N-361	0	1.8	Hanford
199-N-361	1.8	3.1	RE Reworked
199-N-361	3.1	8.2	RE
199-N-362	0	1.2	Hanford
199-N-362	1.2	8.3	RE
199-N-363	0	1.2	Hanford
199-N-363	1.2	8.2	RE
199-N-364	0	1.2	Hanford
199-N-364	1.2	7.9	RE
199-N-366	0	1.2	Hanford
199-N-366	1.2	7.8	RE
199-N-367	0	0.9	Hanford
199-N-367	0.9	8.3	RE
199-N-368	0	8	Hanford
199-N-369	0	8	Hanford
199-N-370	0	8	Hanford
199-N-41	0	13.7	Hanford
199-N-41	13.7	23.8	RE
199-N-43	0	11.6	Hanford
199-N-43	11.6	23.8	RE
199-N-5	32	35.1	RUM Reworked
199-N-5	35.1	38.1	RUM
199-N-50	0	18	Hanford
199-N-50	18	26.2	RE
199-N-52	0	18.9	Hanford
199-N-52	18.9	23.2	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-54	0	14.9	Hanford
199-N-54	14.9	22.3	RE
199-N-57	0	17.4	Hanford
199-N-57	17.4	23.2	RE
199-N-61	0	18	Hanford
199-N-61	18	20.6	RE
199-N-62	0	19.5	Hanford
199-N-62	19.5	23.9	RE
199-N-66	0	16.2	Hanford
199-N-66	16.2	24.4	RE
199-N-69	0	12.8	Hanford
199-N-69	12.8	30.8	RE
199-N-69	30.8	31.7	RUM
199-N-70	0	11.3	Hanford
199-N-70	11.3	31.7	RE
199-N-70	31.7	31.8	RUM
199-N-71	0	16.8	Hanford
199-N-71	16.8	26.5	RE
199-N-75	0	17.1	Hanford
199-N-75	17.1	18.3	RE Reworked
199-N-75	18.3	27.3	RE
199-N-77	29.6	31.4	RUM
199-N-80	0	11.9	Hanford
199-N-80	11.9	29.9	RE
199-N-80	29.9	38.3	RUM
199-N-8P	15.9	30.5	RUM
199-N-91A	0	0.6	Hanford
199-N-91A	0.6	13.4	RE
199-N-91A	13.4	18	RUM
199-N-92A	0	0.6	Hanford
199-N-92A	0.6	12.8	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-92A	12.8	14.6	RUM
199-N-95A	0	4.3	Hanford
199-N-95A	4.3	11.7	RE
199-N-95A	11.7	14.9	RUM
199-N-97A	0	1.4	Hanford
199-N-97A	1.4	18.3	RE
199-N-97A	18.3	18.6	RUM
699-100-43B	9	10.7	RUM
699-101-45	7.8	9.4	RUM
699-52-17	27.4	108.199	RUM
699-52-18A	26.8	27.4	RUM
699-52-18C	30.5	32.6	RUM
699-54-18C	22.9	106.675	RUM
699-54-18E	24.1	27.4	RUM
699-57-16	11.6	12.5	RUM
699-57-25B	24.1	24.7	RUM
699-57-29B	24.7	25	RUM
699-58-24	0	18.3	Hanford
699-60-32	19.8	25.9	RUM
699-60-57	29.3	44.194	RUM
699-60-60	0	18.3	Hanford
699-60-60	18.3	29.9	RE
699-60-60	29.9	39.012	RUM
699-61-26A	0	13.4	Hanford
699-61-26A	13.4	22.6	RE
699-61-26A	22.6	110.6	RUM
699-61-41	12.2	15.9	RUM
699-62-31	22.9	25.6	RUM
699-62-43A	20.1	23.8	RUM
699-62-43F	21.3	24.7	RUM
699-63-25A	18.9	33.5	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
699-63-51	7.6	11	RUM
699-63-55	0	19.8	Hanford
699-63-55	19.8	25	RE
699-63-55	25	34.136	RUM
699-63-58	0	33.5	Hanford
699-63-58	33.5	36.574	RE
699-63-89	0	48.2	Hanford
699-63-89	48.2	63.7	RE
699-63-90	0	41.2	Hanford
699-63-90	41.2	43	RE
699-63-90	43	72.539	RUM
699-64-27	22.6	25.6	RUM
699-65-83	0	36.9	Hanford
699-66-23	16.8	30.5	RUM
699-66-38	8.2	45.7	RUM
699-66-39	12.8	27.4	RUM
699-67-51	0	44.2	Hanford
699-67-51	44.2	64	RE
699-67-51	64	76.2	RUM
699-67-86	75.3	142.3	RUM
699-67-98	0	51.813	Hanford
699-69-45	41.2	91.4	RUM
699-71-30	0	9.1	Hanford
699-71-30	9.1	11.3	RE
699-71-30	11.3	45.7	RUM
699-71-52	53.3	64	RUM
699-71-77	0	22.9	Hanford
699-71-77	22.9	27.4	RE Reworked
699-71-77	27.4	51.8	RE
699-71-77	51.8	54	RUM Reworked
699-71-77	54	91.4	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
699-72-73	0	27.4	Hanford
699-72-73	27.4	50.9	RE
699-72-73	50.9	61	RUM
699-72-92	0	47.2	Hanford
699-72-92	47.2	61	RE
699-73-61	0	38.1	Hanford
699-73-61	38.1	45.7	RE
699-74-23	7.6	15.2	RUM
699-74-44	16.8	45.7	RUM
699-74-48	37.8	45.7	RUM
699-77-36	0	6.1	Hanford
699-77-36	6.1	15.2	RE
699-77-36	15.2	45.7	RUM
699-77-54	0	29	Hanford
699-77-54	29	46.3	RE
699-77-54	46.3	46.6	RUM
699-78-62	0	13.4	Hanford
699-78-62	13.4	45.7	RE
699-80-39B	13.1	16.2	RUM
699-80-43P	14	134.105	RUM
699-80-43Q	13.7	70.7	RUM
699-80-43R	13.7	42.7	RUM
699-80-43S	12.2	15.2	RUM
699-81-58	29	45.7	RUM
699-81-62	0	13.7	Hanford
699-81-62	13.7	32	RE
699-81-62	32	160.317	RUM
699-83-47	0	10.7	Hanford
699-83-47	10.7	29	RE
699-83-47	29	45.7	RUM
699-84-35A	0	13.7	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
699-84-35A	13.7	20.7	RE
699-84-35A	20.7	24.4	RUM Reworked
699-86-60	0	16.8	Hanford
699-86-60	16.8	29.3	RE
699-86-60	29.3	156.964	RUM
699-87-55	0	18.6	Hanford
699-87-55	18.6	28.7	RE
699-89-35	0	13.7	Hanford
699-89-35	13.7	16.8	RE
699-89-35	16.8	22.9	RUM
699-91-46A	0	13.9	Hanford
699-93-48A	0	4.2	Hanford
699-93-48A	4.2	4.7	RE Reworked
699-93-48A	4.7	22.3	RE
699-93-48A	22.3	25.3	RUM
699-94-41	0	9.9	Hanford
699-94-41	9.9	10.8	RE
699-94-41	10.8	12.2	RUM
699-94-43	0	6.7	Hanford
699-94-43	6.7	8.7	RE Reworked
699-94-43	8.7	16.9	RE
699-94-43	16.9	18.5	RUM
699-95-45	0	8.8	Hanford
699-95-45	8.8	9.1	RE Reworked
699-95-45	9.1	13.8	RE
699-95-45	13.8	15.4	RUM
699-95-48	0	9	Hanford
699-95-48	9	18	RE
699-95-48	18	19.6	RUM
699-95-51	0	8.5	Hanford
699-95-51	8.5	11.7	RE Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
699-95-51	11.7	20.1	RE
699-95-51	20.1	21.7	RUM
699-96-41	0	5.8	Hanford
699-96-41	5.8	14.2	RE
699-96-41	14.2	19	RUM
699-96-42	0	7.9	Hanford
699-96-42	7.9	15.7	RE
699-96-42	15.7	15.9	RUM
699-96-43	0	9.1	Hanford
699-96-43	9.1	13.7	RE
699-96-43	13.7	14	RUM Reworked
699-96-43	14	16.2	RUM
699-96-44	0	18.2	Hanford
699-96-45	0	14.3	Hanford
699-96-45	14.3	18.3	RUM
699-96-49	0	18.6	Hanford
699-96-49	18.6	21.3	RE
699-96-49	21.3	24.4	RUM Reworked
699-96-49	24.4	30.5	RUM
699-96-52B	0	12.2	Hanford
699-96-52B	12.2	14	RUM
699-97-41	0	16.5	Hanford
699-97-41	16.5	17.9	RUM
699-97-43	15.2	16.8	RUM Reworked
699-97-43	16.8	30.5	RUM
699-97-43B	0	14.6	Hanford
699-97-43B	14.6	16.3	RUM
699-97-43C	0	14.9	Hanford
699-97-43C	14.9	15.4	RUM Reworked
699-97-43C	15.4	38.4	RUM
699-97-45	12.2	13.9	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
699-97-45B	0	12.1	Hanford
699-97-45B	12.1	36.7	RUM
699-97-48B	0	16.5	Hanford
699-97-48B	16.5	18.1	RUM
699-97-48C	0	16.8	Hanford
699-97-48C	16.8	37.5	RUM
699-98-43	0	10.4	Hanford
699-98-43	10.4	12	RUM
699-98-46	0	12.3	Hanford
699-98-46	12.3	13.9	RUM
699-98-51	0	7.6	Hanford
699-98-51	7.6	9.2	RUM
699-99-41	0	12.2	Hanford
699-99-41	12.2	13.9	RUM
699-99-42B	0	13.9	Hanford
699-99-42B	13.9	15.7	RUM
699-99-44	0	6.1	Hanford
699-99-44	6.1	7	RE Reworked
699-99-44	7	9.9	RE
699-99-44	9.9	11.4	RUM
B2539	0	13.4	Hanford
B2539	13.4	19.7	RE
C6446	0	10.1	Hanford
C6446	10.1	11.3	RE Reworked
C6446	11.3	16.8	RE
C6447	0	8.8	Hanford
C6447	8.8	11.6	RE Reworked
C6447	11.6	12.2	RE
C6449	0	6.7	Hanford
C6449	6.7	11.6	RE Reworked
C6449	11.6	16.5	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
C6450	0	11	Hanford
C6450	11	15.2	RE
C7844	0	18.9	Hanford
C7844	18.9	22.3	RE Reworked
C7845	0	24.1	Hanford
C7847	0	4.1	Hanford
C7849	0	32.8	Hanford
C7855	0	14.3	Hanford
C7855	14.3	15.2	RE Reworked
C7855	15.2	27.8	RE
C7883	0	27.3	Hanford
C7884	0	27.8	Hanford
C7971	0	8.8	Hanford
C7971	8.8	10.2	RUM
C8205	0	14.9	Hanford
C8205	14.9	16.2	RE Reworked
C8205	16.2	51.8	RE
C8205	51.8	56.8	RUM
C8239	0	25.1	Hanford
control_12	91.7	100	RUM
control_13	46	100	RUM
control_3	85.2	100	RUM
control_4	89.6	100	RUM
control_5	97.3	100	RUM
control_8	87.8	100	RUM
RieBC_ctrl 1	0	45.2	Hanford
RieBC_ctrl 1	45.2	77.8	RE
RieBC_ctrl 2	0	46.2	Hanford
RieBC_ctrl 2	46.2	79.2	RE
RieBC_ctrl 3	0	43.6	Hanford
RieBC_ctrl 3	43.6	80	RE

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
RieBC_ctrl 4	0	42.8	Hanford
RieBC_ctrl 4	42.8	81.7	RE
RieBC_ctrl 5	0	51.5	Hanford
RieBC_ctrl 5	51.5	81.7	RE
RieBC_ctrl 6	0	58.9	Hanford
RieBC_ctrl 6	58.9	84.5	RE
RieBC_ctrl 7	0	58.9	Hanford
RieBC_ctrl 7	58.9	87.2	RE
RieBC_ctrl 8	0	71.8	Hanford
RieBC_ctrl 8	71.8	89.2	RE
RieBC_ctrl 9	0	70.9	Hanford
RieBC_ctrl 9	70.9	91.6	RE
199-B3-1	0	19.2	Hanford
199-B3-47	0	18.59	Hanford
199-B3-52	0	18.29	Hanford
199-B4-7	0	29.42	Hanford
199-B4-9	0	28.29	Hanford
199-B4-14	0	29.2	Hanford
199-B4-15	0	25.69	Hanford
199-D5-155	3.66	10.09	RE
199-D5-155	10.09	10.58	RUM
199-D5-156	2.59	10.06	RE
199-D5-156	10.06	10.58	RUM Reworked
199-D5-156	10.58	10.94	RUM
199-D5-157	2.8	10.24	RE
199-D5-157	10.24	10.41	RUM
199-D8-101	0	21.95	Hanford
199-F8-2	0	16.46	Hanford
199-F8-2	16.46	16.76	RUM Reworked
199-H4-6	0	16.76	Hanford
199-K-33	0	20.3	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-137	0	7.2	Hanford
199-K-137	7.2	32.9	RE
199-K-158	0	10.67	Hanford
199-K-158	10.67	18.29	RE Reworked
199-K-158	18.29	35.2	RE
199-K-192	43.28	44.81	RUM Reworked
199-K-192	44.81	58.8	RUM
199-N-202	0	0.15	Hanford
199-N-202	0.15	5.21	RE Reworked
199-N-230	0	0.3	Hanford
199-N-230	0.3	4.82	RE Reworked
699-101-48C	0	14.33	Hanford
699-66-58	0	34.29	Hanford
699-75-23A	0	10.67	Hanford
699-75-23A	10.67	10.77	RUM
699-75-23B	0	10.97	Hanford
699-75-23B	10.97	11.07	RUM
699-81-64B	0	11.58	Hanford
699-84-59	0	15.85	Hanford
699-84-59	15.85	15.95	RE
B2537	0	22.1	Hanford
C7842	0	16.76	Hanford
C7850	0	22.04	Hanford
C7851	0	21.03	Hanford
C7862	0	15.97	Hanford
C7864	0	15.48	Hanford
199-D5-159	0	13.716	Hanford
199-D5-159	13.716	16.1544	RE Reworked
199-D5-159	16.1544	28.956	RE
199-D5-159	28.956	30.1752	RUM Reworked
199-D5-159	30.1752	32.4612	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-H1-46	0	12.192	Hanford
199-H1-46	12.192	14.0208	RUM Reworked
199-H1-46	14.0208	15.36192	RUM
199-H4-92	0	1.524	Hanford
199-H4-92	1.524	15.5448	RE
199-H4-92	15.5448	16.1544	RUM Reworked
199-H4-92	16.1544	17.92224	RUM
199-H4-93	0	1.0668	Hanford
199-H4-93	1.0668	15.5448	RE
199-H4-93	15.5448	16.4592	RUM Reworked
199-H4-93	16.4592	17.6784	RUM
199-H5-16	0	2.1336	Hanford
199-H5-16	2.1336	18.19656	RE Reworked
199-H5-16	18.19656	20.78736	RUM
199-H6-7	0	13.5636	Hanford
199-H6-7	13.5636	16.67256	RUM
199-H6-8	0	20.7264	Hanford
199-H6-8	20.7264	22.46376	RUM
199-K-207	0	8.5344	Hanford
199-K-207	8.5344	45.72	RE
199-K-207	45.72	47.3964	RUM
199-K-208	0	6.096	Hanford
199-K-208	6.096	38.862	RE
199-K-208	38.862	40.81272	RUM
199-K-209	0	22.2504	Hanford
199-K-209	22.2504	45.1104	RE
199-K-209	45.1104	45.72	RUM Reworked
199-K-209	45.72	47.12208	RUM
199-K-221	0	12.0396	Hanford
199-K-221	12.0396	31.88208	RE
199-K-222	0	6.82752	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-K-222	6.82752	15.63624	RE Reworked
199-K-222	15.63624	36.16452	RE
199-N-165	0	9.7536	Hanford
199-N-165	9.7536	17.526	RE Reworked
199-N-165	17.526	26.2128	RE
199-N-375	0	16.39824	Hanford
199-N-375	16.39824	16.764	RE Reworked
199-N-375	16.764	30.46476	RE
699-93-48C	0	4.572	Hanford
699-93-48C	4.572	13.1064	RE Reworked
699-93-48C	13.1064	18.8976	RE
699-93-48C	18.8976	20.4216	RUM
699-95-45B	0	1.2192	Hanford
699-95-45B	1.2192	12.192	RE
699-95-45B	12.192	14.11224	RUM
699-97-47B	0	3.048	Hanford
699-97-47B	3.048	10.0584	RE Reworked
699-97-47B	10.0584	10.668	RUM Reworked
699-97-47B	10.668	11.70432	RUM
699-97-60	0	1.524	Hanford
699-97-60	1.524	10.0584	RE Reworked
699-97-60	10.0584	15.3924	RE
699-97-60	15.3924	16.88592	RUM Reworked
699-97-60	16.88592	27.136344	RUM
699-97-61	0	0.9144	Hanford
699-97-61	0.9144	20.4216	RE Reworked
699-97-61	20.4216	30.75432	RUM
699-101-48C	14.33	23.47	RE Reworked
199-D5-102	0	24.4	Hanford
199-D5-102	24.4	32.9	RE
199-K-173	0	19.8	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-B3-2	199.939	240.792	Basalt
199-H4-2	109.723	117.6528	Basalt
699-52-17	108.199	115.824	Basalt
699-54-18C	106.675	108.204	Basalt
699-60-57	44.194	47.244	Basalt
699-60-60	39.012	39.0144	Basalt
699-61-62	54.099	57.3024	Basalt
699-61-66	65.834	68.58	Basalt
699-63-55	34.136	38.1	Basalt
699-63-58	36.574	40.5384	Basalt
699-63-89	63.7	67.056	Basalt
699-63-90	72.539	77.1144	Basalt
699-63-92	45.718	56.6928	Basalt
699-63-95	23.773	215.4936	Basalt
699-65-50	176.166	178.308	Basalt
699-65-95	17.068	32.3088	Basalt
699-66-91	29.869	57.912	Basalt
699-67-98	51.813	56.388	Basalt
699-80-43P	134.105	137.16	Basalt
699-81-62	160.317	308.1528	Basalt
699-84-35A	24.4	109.723	RUM
699-84-35A	109.723	112.776	Basalt
699-84-59	159.707	305.1048	Basalt
699-86-60	156.964	161.8488	Basalt
199-D4-102	0	17.0688	Hanford
199-D4-102	17.0688	21.6408	RE Reworked
199-D4-102	21.6408	28.956	RE
199-D4-102	28.956	31.0896	RUM Reworked
199-D4-102	31.0896	33.4518	RUM
199-D4-103	0	16.764	Hanford
199-D4-103	16.764	20.4216	RE Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-D4-103	20.4216	29.8704	RE
199-D4-103	29.8704	33.72612	RUM Reworked
199-D5-149	0	16.764	Hanford
199-D5-149	16.764	18.288	RE Reworked
199-D5-149	18.288	32.6136	RE
199-D5-149	32.6136	34.341816	RUM
199-D5-150	0	18.288	Hanford
199-D5-150	18.288	28.956	RE
199-D5-150	28.956	32.3088	RUM Reworked
199-D5-150	32.3088	33.884616	RUM
199-D5-151	0	9.144	Hanford
199-D5-151	9.144	11.5824	RE Reworked
199-D5-151	11.5824	28.0416	RE
199-D5-151	28.0416	29.718	RUM
199-D5-152	0	12.192	Hanford
199-D5-152	12.192	27.8892	RE
199-D5-152	27.8892	29.9466	RUM
199-D5-160	0	16.1544	Hanford
199-D5-160	16.1544	25.2984	RE Reworked
199-D5-160	25.2984	32.6136	RE
199-D5-160	32.6136	32.9184	RUM Reworked
199-D5-160	32.9184	34.93008	RUM
199-D8-102	0	17.6784	Hanford
199-D8-102	17.6784	31.0896	RE
199-D8-102	31.0896	32.9184	RUM Reworked
199-D8-102	32.9184	33.963864	RUM
199-H4-87	17.3736	19.784568	RUM
199-H4-88	0	16.1544	Hanford
199-H4-88	16.1544	18.25752	RUM
199-H4-89	0	13.716	Hanford
199-H4-89	13.716	14.0208	RUM Reworked

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-H4-89	14.0208	15.28572	RUM
199-K-223	0	14.6304	Hanford
199-K-223	14.6304	17.9832	RE Reworked
199-K-223	17.9832	52.4256	RE
199-K-223	52.4256	54.053232	RUM
199-K-224	0	8.8392	Hanford
199-K-224	8.8392	18.288	RE Reworked
199-K-224	18.288	54.2544	RE
199-K-224	54.2544	56.659272	RUM
199-K-225	0	11.2776	Hanford
199-K-225	11.2776	19.2024	RE Reworked
199-K-225	19.2024	47.8536	RE
199-K-225	47.8536	48.768	RUM Reworked
199-K-225	48.768	50.33772	RUM
199-K-226	0	3.048	Hanford
199-K-226	3.048	6.096	RE Reworked
199-K-226	6.096	43.434	RE
199-K-226	43.434	45.351192	RUM
199-N-371	0	14.6304	Hanford
199-N-371	14.6304	16.4592	RE Reworked
199-N-371	16.4592	27.67584	RE
199-N-371	27.67584	29.2608	RUM
199-N-372	0	15.8496	Hanford
199-N-372	15.8496	17.6784	RE Reworked
199-N-372	17.6784	30.48	RE
199-N-372	30.48	32.12592	RUM
199-N-373	0	15.24	Hanford
199-N-373	15.24	16.764	RE Reworked
199-N-373	16.764	25.908	RE
199-N-373	25.908	29.2608	RUM Reworked
199-N-373	29.2608	30.87624	RUM

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
199-N-374	0	14.3256	Hanford
199-N-374	14.3256	16.1544	RE Reworked
199-N-374	16.1544	24.9936	RE
199-N-374	24.9936	29.2608	RUM Reworked
199-N-374	29.2608	31.05912	RUM
199-N-376	0	18.7452	Hanford
199-N-376	18.7452	28.4988	RE
199-N-376	28.4988	31.583376	RUM Reworked
199-N-376	31.583376	33.32988	RUM
199-N-377	0	13.4112	Hanford
199-N-377	13.4112	27.7368	RE
199-N-377	27.7368	31.60776	RUM Reworked
199-N-377	31.60776	33.320736	RUM
699-66-30	0	6.7056	Hanford
699-66-30	6.7056	9.561576	RUM
699-66-32	0	8.2296	Hanford
699-66-32	8.2296	8.8392	RUM Reworked
699-66-32	8.8392	11.87196	RUM
699-67-26	0	9.144	Hanford
699-67-26	9.144	12.640056	RUM
699-71-26	0	9.144	Hanford
699-71-26	9.144	9.4488	RUM Reworked
699-71-26	9.4488	12.396216	RUM
699-71-34	0	7.9248	Hanford
699-71-34	7.9248	9.144	RUM Reworked
699-71-34	9.144	11.195304	RUM
699-75-28	0	14.6304	Hanford
699-75-28	14.6304	17.95272	RUM
699-75-31	0	9.4488	Hanford
699-75-31	9.4488	12.444984	RUM
699-75-34	0	10.0584	Hanford

Table A-2. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for Wells used in the Model (See Table A-1 for well locations and depths)

Well Name	From	To	Lithology
699-75-34	10.0584	10.3632	RUM Reworked
699-75-34	10.3632	13.615416	RUM
699-75-34B	0	10.3632	Hanford
699-75-34B	10.3632	12.8016	RUM
699-88-41A	0	15.5448	RE Reworked
699-88-41A	15.5448	16.4592	RUM Reworked
699-88-41A	16.4592	29.27	RUM
699-90-45B	0	8.8392	Hanford
699-90-45B	8.8392	11.8872	RE Reworked
699-90-45B	11.8872	18.5928	RE
699-90-45B	18.5928	20.4216	RUM Reworked
699-90-45B	20.4216	20.93976	RUM
699-90-47B	0	4.8768	Hanford
699-90-47B	4.8768	11.8872	RE Reworked
699-90-47B	11.8872	17.6784	RE
699-90-47B	17.6784	18.5928	RUM Reworked
699-90-47B	18.5928	20.48256	RUM
699-93-37A	0	15.8496	Hanford
699-93-37A	15.8496	18.5928	RE Reworked
699-93-37A	18.5928	20.2692	RUM Reworked
199-H4-15C	14	95.7	RUM
199-H4-15C	95.7	100.6	Basalt
699-65-50	35.1	176.166	RUM

Table A-3. Well Names, Locations, Maximum Drill Depths, and Surface Elevations Added to the Model for FY 2016

Well Name	X-COORD	Y-COORD	Z-COORD	Drill Depth*
199-D4-102	572750.41	151458.68	143.52	33.5
199-D4-103	572749.45	151243.34	143.68	33.7
199-D5-149	573327.62	151461.82	143.92	34.3
199-D5-150	573429.42	151401.85	143.88	33.9
199-D5-151	573312.03	151391.88	139.64	29.7
199-D5-152	573300.18	151349.10	139.01	29.9
199-D5-160	573517.16	151429.17	143.68	34.9
199-D8-102	573661.84	152076.09	142.58	34.7
199-H4-87	577736.16	152667.79	129.25	19.8
199-H4-88	577850.51	152833.59	130.92	18.3
199-H4-89	577923.32	152893.98	128.20	17.3
199-K-223	568781.07	146145.09	144.75	54.1
199-K-224	568735.26	146205.95	145.94	56.7
199-K-225	569281.59	146457.74	145.11	50.3
199-K-226	569186.87	147038.68	135.15	45.4
199-N-371	571133.65	149571.82	138.42	29.3
199-N-372	571104.79	149500.24	139.07	32.1
199-N-373	571276.14	149441.79	139.43	30.9
199-N-374	571116.32	149532.29	139.12	31.1
199-N-376	571137.72	149346.36	140.13	33.3
199-N-377	571277.91	149677.94	139.68	33.3
699-66-30	580895.57	143649.79	121.19	9.6
699-66-32	580059.33	143628.39	126.57	11.9
699-67-26	581949.54	143798.07	120.79	12.6
699-71-26	581918.55	145176.00	121.34	12.4
699-71-34	579602.08	145271.21	120.95	11.2
699-75-28	581538.22	146514.93	125.07	18.0
699-75-31	580385.85	146516.19	123.21	12.4
699-75-34	579477.05	146444.09	122.45	13.6
699-75-34B	579478.30	146447.03	122.63	12.8

699-88-41A	577406.82	150957.60	127.93	18.0
699-90-45B	576441.52	150967.00	129.67	20.9
699-90-47B	575298.23	150951.48	130.18	20.5
699-93-37A	578449.32	151455.62	125.37	20.3

* = Maximum drill depth is approximately ± 1 m of actual borehole total drill depth to facilitate model visualization.

Table A-4. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for New Wells used in the Model (See Table A-3 for well locations and depths)

Well Name	From	To	Lithology
199-D4-102	0	17.0688	Hanford
199-D4-102	17.0688	21.6408	RE Reworked
199-D4-102	21.6408	28.956	RE
199-D4-102	28.956	31.0896	RUM Reworked
199-D4-102	31.0896	33.4518	RUM
199-D4-103	0	16.764	Hanford
199-D4-103	16.764	20.4216	RE Reworked
199-D4-103	20.4216	29.8704	RE
199-D4-103	29.8704	33.72612	RUM Reworked
199-D5-149	0	16.764	Hanford
199-D5-149	16.764	18.288	RE Reworked
199-D5-149	18.288	32.6136	RE
199-D5-149	32.6136	34.341816	RUM
199-D5-150	0	18.288	Hanford
199-D5-150	18.288	28.956	RE
199-D5-150	28.956	32.3088	RUM Reworked
199-D5-150	32.3088	33.884616	RUM
199-D5-151	0	9.144	Hanford
199-D5-151	9.144	11.5824	RE Reworked
199-D5-151	11.5824	28.0416	RE

Table A-4. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for New Wells used in the Model (See Table A-3 for well locations and depths)

Well Name	From	To	Lithology
199-D5-151	28.0416	29.718	RUM
199-D5-152	0	12.192	Hanford
199-D5-152	12.192	20.1168	RE Reworked
199-D5-152	20.1168	27.8892	RE
199-D5-152	27.8892	29.9466	RUM
199-D5-160	0	16.1544	Hanford
199-D5-160	16.1544	25.2984	RE Reworked
199-D5-160	25.2984	32.6136	RE
199-D5-160	32.6136	32.9184	RUM Reworked
199-D5-160	32.9184	34.93008	RUM
199-D8-102	0	17.6784	Hanford
199-D8-102	17.6784	31.0896	RE
199-D8-102	31.0896	32.9184	RUM Reworked
199-D8-102	32.9184	33.963864	RUM
199-H4-87	17.3736	19.784568	RUM
199-H4-88	0	16.1544	Hanford
199-H4-88	16.1544	18.25752	RUM
199-H4-89	0	13.716	Hanford
199-H4-89	13.716	14.0208	RUM Reworked
199-H4-89	14.0208	15.28572	RUM
199-K-223	0	14.6304	Hanford
199-K-223	14.6304	17.9832	RE Reworked
199-K-223	17.9832	52.4256	RE
199-K-223	52.4256	54.053232	RUM
199-K-224	0	8.8392	Hanford
199-K-224	8.8392	18.288	RE Reworked
199-K-224	18.288	54.2544	RE
199-K-224	54.2544	56.659272	RUM
199-K-225	0	11.2776	Hanford
199-K-225	11.2776	19.2024	RE Reworked

Table A-4. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for New Wells used in the Model (See Table A-3 for well locations and depths)

Well Name	From	To	Lithology
199-K-225	19.2024	47.8536	RE
199-K-225	47.8536	48.768	RUM Reworked
199-K-225	48.768	50.33772	RUM
199-K-226	0	3.048	Hanford
199-K-226	3.048	6.096	RE Reworked
199-K-226	6.096	43.434	RE
199-K-226	43.434	45.351192	RUM
199-N-371	0	14.6304	Hanford
199-N-371	14.6304	16.4592	RE Reworked
199-N-371	16.4592	27.67584	RE
199-N-371	27.67584	29.2608	RUM
199-N-372	0	15.8496	Hanford
199-N-372	15.8496	17.6784	RE Reworked
199-N-372	17.6784	30.48	RE
199-N-372	30.48	32.12592	RUM
199-N-373	0	15.24	Hanford
199-N-373	15.24	16.764	RE Reworked
199-N-373	16.764	25.908	RE
199-N-373	25.908	29.2608	RUM Reworked
199-N-373	29.2608	30.87624	RUM
199-N-374	0	14.3256	Hanford
199-N-374	14.3256	16.1544	RE Reworked
199-N-374	16.1544	24.9936	RE
199-N-374	24.9936	29.2608	RUM Reworked
199-N-374	29.2608	31.05912	RUM
199-N-376	0	18.7452	Hanford
199-N-376	18.7452	28.4988	RE
199-N-376	28.4988	31.583376	RUM Reworked
199-N-376	31.583376	33.32988	RUM
199-N-377	0	13.4112	Hanford

Table A-4. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for New Wells used in the Model (See Table A-3 for well locations and depths)

Well Name	From	To	Lithology
199-N-377	13.4112	27.7368	RE
199-N-377	27.7368	31.60776	RUM Reworked
199-N-377	31.60776	33.320736	RUM
699-66-30	0	6.7056	Hanford
699-66-30	6.7056	9.561576	RUM
699-66-32	0	8.2296	Hanford
699-66-32	8.2296	8.8392	RUM Reworked
699-66-32	8.8392	11.87196	RUM
699-67-26	0	9.144	Hanford
699-67-26	9.144	12.640056	RUM
699-71-26	9.4488	12.396216	RUM
699-71-34	0	7.9248	Hanford
699-71-34	7.9248	9.144	RUM Reworked
699-71-34	9.144	11.195304	RUM
699-75-28	0	14.6304	Hanford
699-75-28	14.6304	17.95272	RUM
699-75-31	0	9.4488	Hanford
699-75-31	9.4488	12.444984	RUM
699-75-34	0	10.0584	Hanford
699-75-34	10.0584	10.3632	RUM Reworked
699-75-34	10.3632	13.615416	RUM
699-75-34B	0	10.3632	Hanford
699-75-34B	10.3632	12.8016	RUM
699-88-41A	0	15.5448	RE Reworked
699-88-41A	15.5448	16.4592	RUM Reworked
699-88-41A	16.4592	29.27	RUM
699-90-45B	0	8.8392	Hanford
699-90-45B	8.8392	11.8872	RE Reworked
699-90-45B	11.8872	18.5928	RE
699-90-45B	18.5928	20.4216	RUM Reworked

Table A-4. Current Lithologic Unit Selections from GeoContacts_100-Area_2016-20-12.xlsx for New Wells used in the Model (See Table A-3 for well locations and depths)

Well Name	From	To	Lithology
699-90-45B	20.4216	20.93976	RUM
699-90-47B	0	4.8768	Hanford
699-90-47B	4.8768	11.8872	RE Reworked
699-90-47B	11.8872	17.6784	RE
699-90-47B	17.6784	18.5928	RUM Reworked
699-90-47B	18.5928	20.48256	RUM
699-93-37A	0	15.8496	Hanford
699-93-37A	15.8496	18.5928	RE Reworked
699-93-37A	18.5928	20.2692	RUM Reworked

Attachment B

Wells and Intervals Omitted from Model

This attachment provides a listing of wells that were not included in the model because of uncertainty in the borehole data or because the density of the borehole locations is significantly less than the model grid which caused serious interpolation errors. For more details, see GeoContacts_100-Area_2016-20-12.xlsx.

[redacted]

4/28/15

100-Area model:

Things I did:

Turned off PE699-84-59 / has all "X's" for RUM contacts and this is a deep well.

- ✓ 199-B3-47 : Remove !
- ✓ C7842 : Remove !
- ✓ 199-B3-1 : Remove !

(turn off X's !)

- ✓ 199-B3-52
- ✓ 199-B4-1 through 7, B4-9 to 10, B4-14
- ✓ B4-15
- ✓ B2-13
- ✓ D5-19 turn off HF + RE, preserve RUM.
- ✓ D8-101 turn off
- ✓ F5-1 turn off HF + RE:
- ✓ F5-56 -"-
- ✓ F6-1 -"-
- ✓ F7-1 -"-

Keep RUM

- ✓ F8-2 turn off all
- ✓ F8-3 RUM only
- ✓ F8-4
- ✓ F8-7
- ✓ H1-3 RUM only + Rem RUM

H1-25	RUN + ReRUN only	
H1-32		
33		
34		
35		
H4-1	RUN + ReRUN only (Keep)	
H4-2		
H4-5		
H4-6	turn off all	
7	Run only (Keep)	
8		
9		
10		
11		
12A		
12B		
13		
14		
15A		
15B		
15C		
46		
49		
65		

[redacted]

[redacted]

✓	H4-76	RUM only (Keep)
✓	-91	-11-
✓	H5-1A	|
✓	K-28	turn off all
✓	K-33	-11-
✓	K-192	RUM + ReRUM only (Keep)
✓	N-5	-11-
✓	N-8P	-11-
✓	N-77	-11-
✓	N-201	turn off all
✓	N-202	-11-
✓	N-204	-11-
✓	N-229	-11-
✓	N-230	-11-
✓	N-233	-11-
✓	N-240	-11-
✓	699-100-43B	Rum + ReRum only (Keep)
✓	101-45	-11-
✓	101-48C	turn off all
✓	52-17	Rum + ReRum only (Keep)
✓	52-18A	|
✓	52-18C	|
✓	52-18E	|
✓	57-16	|

(Keep)

✓	699-57-25B	Rum + ReRum only (keep)
✓	699-57-29B	-11-
✓	59-32	turn off all
✓	60-32	Rum + ReRum only (Keep)
✓	60-57	-11-
✓	61-37	turn off all
✓	61-41	Rum + ReRum only (keep)
✓	61-62	turn off all
✓	61-66	-11-
✓	62-31	Rum + ReRum only (Keep)
✓	62-43A	-11-
✓	62-43F	-11-
✓	63-25A	-11-
✓	63-51	-11-
✓	63-92	turn off all
✓	63-95	-11-
✓	64-27	Rum + ReRum only (keep)
✓	65-50	-11-
✓	65-72	turn off all
✓	65-95	-11-
✓	66-103	-11-
✓	66-23	Rum + ReRum only (keep)
✓	66-38	-11-
✓	66-39	-11-

[redacted]

✓	699-66-58	turn off all
✓	66-64	-11-
✓	66-91	-11-
✓	67-77	-11-
✓	67-86	Rum + Re Rum only
✓	68-105	turn off all
✓	69-45	Rum + Re Rum (Keep)
✓	71-52	-11-
✓	71-85	turn off all
✓	72-88	turn off all
✓	74-23	Rum + Re Rum (Keep)
✓	74-44	
✓	74-48	
✓	75-23A	
✓	75-23B	
✓	80-39B	
✓	80-43P	
✓	80-43Q	
✓	80-43R	
✓	80-43S	
✓	81-38	all
✓	81-58	Rum + Re Rum only
✓	81-64B	off all
✓	84-59	-11-

✓ 699-97-43	Rum + Return only (Reg).
✓ 94-45	+/-
✓ B2537	turn off all
✓ C5610	+/-
✓ C7842	-/-
✓ C7851	+/-
✓ C7862	+/-
✓ C7864	+/-

5/1/15

✓ 699-D8-71	turn off HF
✓ D8-68	-/-
✓ D7-5	-/-
✓ D5-156	turn off HF + RE
✓ D5-155	turn off
✓ D5-157	-/-
✓ D5-99	-/-
✓ D5-158	-/-
✓ D4-2	+/-
✓ D4-57	HF

[redacted]

✓ K-184	turn off HF + RE
✓ K-137	-/-
✓ D-122	turn off all

[redacted]

[redacted]

✓ 199-D5-102	turn off Hf & RE
✓ C7850	-"-
✓ 199 D-70	turned Hf
✓ 199-D-54A	turn off all except RUM
✓ 199-D-156	turn off all
✓ 199-D-146	all except RUM & Re Rem
✓ 199-D8-70	- Hf only
✓ 4 D8-69	-"-
[redacted]	
✓ K-173	-"-
✓ K-158	-all-
✓ K-139	-"-
✓ 199-D8-53	Hf & Re off
✓ D8-54B	-"-
✓ K-92	all turned off
✓ K-198	- all -

199-K-162: Turned off Hf and RE because contacts were not consistent with nearby newer wells (e.g 199-K-197 to 199).

2016-01-06 11:32 - Update drillhole 199-K-221 RE top to 12.0396. Reflected in Geocontacts_100-Area_2016_01_05_DRAFT.xlsx.

2016-01-06 11:32 - Update drillhole 199-K-222 RE Reworked top to 6.82752. Reflected in Geocontacts_100-Area_2016_01_05_DRAFT.xlsx.

2016-01-07 10:57 - Updated drillhole 699-73-61. RE top is now deeper at 38.1 m bgs.

2016-05-31 12:43 For wells D4-30, D4-60, D4-61, D4-66, D4-70, D4-71, D4-73, D4-74, D4-76, D8-4, H4-10, H4-11, H4-14, H4-16, 699-75-23A 699-75-23B and 0.1 m was added to the bottom of the RUM depth in order to reconcile from depth >= to depth discrepancies.

2016-05-31 14:21 699-84-59: Adjusted bottom of RE in order to eliminate anomalous bubble.

2016-05-31 14:45 199-K-192: turned off Hf contact as this was pushed falsely deep due to Geocontacts inputs.

2016-05-31 14:48 199-K-28 was turned off because of uncertain RE and RUM contacts (caused a bubble) in GCDB.

2016-05-31 14:53 199-K-139 turned off. GCDB picks need revisiting (typos?).

2016-05-31 14:57 199-K-137 turned off due to bubbling. Suggest revisiting picks in GCDB.

2016-05-31 15:26 D-155, 156 and 157 had Hf turned off because GCDB indicates RE at the drill pad. These wells were constructed within an excavation.

2016-06-06 12:44 Wells turned off to reconcile with previous version (01-06-15) include the following: These were turned back on @ 2016-06-09 14:37.

2016-06-06 13:01 Well 199-K-27 turned off to elimenate a "bubble" in the Ringold E.

2016-06-06 13:02 699-73-61 Ringold E pick updated in Model from 12.2 to 38.1.

2016-06-06 13:03 Units added back to the following wells:

699-101-48C	14.33	23.47	RE Reworked
699-80-43R	0.0	12.8	Hanford
699-80-43R	12.8	13.7	Ringold E

2016-06-06 13:06 In the previous model version (01-06-15) and in this current version, the follwing wells had uncertain ("X" in GCDB) RE and/or Reworked picks and therefore have Hanford, RE and Reworked RE turned off: 199-B3-52, 199-B4-1 through B4-6, 199-B4-9 and 10, 199-N-77, 699-67-86, 199-K-128, 699-81-58, 199-N-5, 199-N-103A, 199-D5-97, 199-D5-145 and 146, 199-D5-141 199-D5-122, 199-D5-119, 199-D5-104, 199-D5-102, 199-D5-101, 199-D5-102, 199-D5-93, 199-D5-121, 199-D5-155, 199-D5-158, 199-D5-19, 199-D8-68, 199-D8-71, 199-D8-54A, 199-D8-94, 199-D8-54B, 199-D8-53, 199-D8-70, 199-D8-69, 699-97-45, 699-59-32, 699-61-37, 199-H1-3, 699-97-43, 699-61-62, 699-61-66, 699-68-105, 699-63-95, 199-B2-13, C5670, 699-63-92, 699-66-91, 699-66-103, 699-65-72, 699-65-95, 699-66-64, 199-H4-76, 699-101-45, 199-H1-25, 199-H1-32 and 33, 199-H1-35, 199-H4-10, 199-H4-15A thourgh C, 199-H4-5, 199-H4-8 and 9, 199-H4-12A and B

2016-06-09 14:22 These were turned back on: 699-67-98, 699-84-59, 199-K-137, 199-K-173, 699-58-24, 199-K-168, 199-K-158, 199-K-199, 199-K-184, 199-N-352, 199-N-356, 199-K-169 and 199-B4-15.

2016-06-10 13:47 199-K-139 turned off due it causing a bubble.

2016-06-10 14:31 Added back Hf and RE intervals for 199-D5-146, 199-D5-102 and 199-K-173.

2016-06-10 15:07 Subsequently turned off 199-K-146 Hf and Re units due to bubbling.

2016-06-13 09:46 Turned off 199-D5-97 and 199-D2-8 to eliminate bubbling.

2016-06-14 14:19 Added basalt intervals for the following wells: 199-B3-2, 199-H4-2, 199-H4-15C,699-52-17, 699-54-18C, 699-60-57, 699-60-60, 699-61-62, 699-61-66, 699-63-55, 699-63-58, 699-63-89, 699-63-90, 699-63-92, 699-63-95, 699-65-50, 699-65-95, 699-66-91, 699-67-98, 699-80-43P, 699-81-62, 699-84-35A, 699-84-59, 699-86-60

2017-01-05 11:37 699-88-41A (New Well 2016) - This well had a RUM pick deeper than well max depth. Max depth increased to 0.01 meter deeper than RUM pick to 29.27.

2017-01-11 ~16:30 Reloaded lithology data with updated wells:
added RUM picks for well 699-65-50 and basalt pick for well 199-H4-15C

2017-03-30 13:36 199-K-223 Changed RUM pick to 52.4256 from previous (~54.2) to reflect GCDB updates.

2017-04-10 16:58 Added extra lines to RE contacts 3 near 100-H near wells H4-48, H4-86 and H4-63. Also turned off Hf interval in

2017-03-30 13:40 199-K-224 Changed RUM pick to 54.2544 from previous (48.768) to reflect GCDB updates.

2017-03-30 13:46 699-88-41A Changed RUM pick to 16.4592 from previous (29.26) to reflect GCDB updates.

2017-04-20 08:39 Ignore 199-D5-122 well interval data. Only using 199-D5-152 well data at that point.
199-K-137 Hanford was 0-17.07 now 0-7.2, represented in RE
199-K-166 Hanford was 0-16.8 now 0-8.2, represented in RE
(New picks from Travis H. using borehole logs).

2017-07-25 16:29 Ignore 199-D5-119 and change 199-D5-152 formation RE Reworked to RE on 199-D5-152 (RE top set to RE Reworked Top)

Attachment C

Software Installation and Checkout Form for Leapfrog Geo

CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM

Software Owner Instructions:

Complete Fields 1-13, then run test cases in Field 14. Compare test case results listed in Field 15 to corresponding Test Report outputs. If results are the same, sign and date Field 19. If not, resolve differences and repeat above steps.

Software Subject Matter Expert Instructions:

Assign test personnel. Approve the installation of the code by signing and dating Field 21, then maintain form as part of the software support documentation.

GENERAL INFORMATION:

1. Software Name: Leapfrog Geo Software Version No.: 3.0.0

EXECUTABLE INFORMATION:

2. Executable Name (include path):

[redacted]\bin\geo.exe

3. Executable Size (bytes):

COMPILATION INFORMATION:

4. Hardware System (i.e., property number or ID):

Vendor supplied

5. Operating System (include version number):

Windows (Vendor supplied)

INSTALLATION AND CHECKOUT INFORMATION:

6. Hardware System (i.e., property number or ID):

INTERA Lenovo Laptop #00771

7. Operating System (include version number):

Windows 8.1 Pro

8. Open Problem Report? (●) No ( ) Yes PR/CR No.

TEST CASE INFORMATION:

9. Directory/Path:

[redacted]:\leapfrog\

10. Procedure(s):

per CHPRC-01754 Rev 1, Leapfrog-Hydro and Leapfrog-Geo Software Test Plan

11. Libraries:

N/A

12. Input Files:

per CHPRC-01754 Rev 1, Leapfrog-Hydro and Leapfrog-Geo Software Test Plan

13. Output Files:

per CHPRC-01754 Rev 1, Leapfrog-Hydro and Leapfrog-Geo Software Test Plan

14. Test Cases:

Vendor Installation Package, TC-1, TC-2,TC-3, TC-4, Tc-5, TC-6

15. Test Case Results:

Pass

16. Test Performed By: Travis Hammond

17. Test Results: (●) Satisfactory, Accepted for Use ( ) Unsatisfactory

18. Disposition (include HISI update):

Accepted; installation added to Hanford Off-Site user list

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CHPRC SOFTWARE INSTALLATION AND CHECKOUT FORM (continued)

1. Software Name: Leapfrog Geo Software Version No.: 3.0.0

Prepared By:

19.	Software Owner (Signature)	WE Nichols Print	4 Jan 2016 Date

20. Test Personnel:

Sign	TB Hammond Print	12/16/15 Date
Sign	Print	Date
Sign	Print	Date

Approved By:

21.	Software SME (Signature)	N/R per SMP Print	Date