Hydrogeologic Assessment for Compliance of 1,4-Dioxane Midway Landfill

Prepared for

Seattle Public Utilities

October 2019

Prepared by

Parametrix

In Association with

ehsi

EHS-International, Inc.

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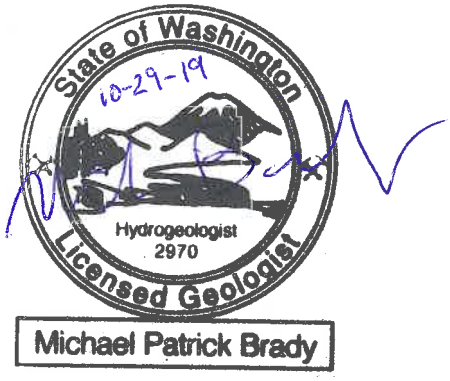
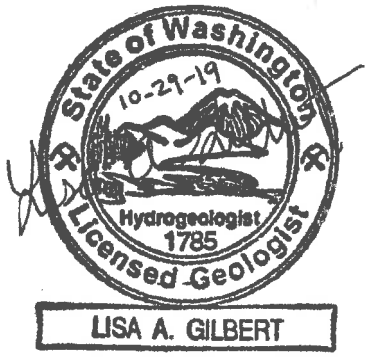
CERTIFICATION

The technical material and data contained in this document were prepared under the supervision and direction of the undersigned, whose seal, as a professional engineer licensed to practice as such, is affixed below.



Prepared by Michael Brady, LHG



Reviewed by Lisa Gilbert, LHG

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ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
1,1-DCE	1,1-dichloroethene
1,2 DCE	1,2-dichloroethene
AA	Alluvial Aquifer
AGI	Applied Geotechnology, Inc.
ART	Accelerated Remediation Technologies
CAP	cleanup action plan
City	City of Seattle
Corps	U.S. Army Corps of Engineers
CSCSL	Confirmed and Suspected Contaminated Sites List
DA	Deep Aquifer
DNAPL	dense non-aqueous phase liquid
DOH	Washington State Department of Health
Ecology	Washington State Department of Ecology
EHSI	EHS-International, Inc.
EIM	Environmental Information Management
EPA	U.S. Environmental Protection Agency
GC/MS	gas chromatography-mass spectrometry
IC	Institutional Controls
LA	Landfill Aquifer
MCL	Maximum Contaminant Level
MTCA	Model Toxics Control Act
NGA	Norther Gravel Aquifer
NPL	National Priorities List
PA	Perched Aquifer
PCE	tetrachloroethylene
PET	polyethylene terephthalate
Qal	Quaternary Alluvial
Qpfc	Quaternary pre-Fraser coarse-grained deposits
Qpogc	Pre-Olympia coarse-grained glacial deposits
Qpon	Quaternary pre-Olympia age non-glacial deposits

ACRONYMS AND ABBREVIATIONS (CONTINUED)

Qrn	Quaternary reversely magnetized non-glacial deposits
Qu	Quaternary undifferentiated deposits
Qva	Quaternary Vashon Advance Outwash
RCW	Revised Code of Washington
RI	remedial investigation
RI/FS	Remedial Investigation/Feasibility Study
ROD	record of decision
SA	Sand Aquifer
SGA	Southern Gravel Aquifer
SIM	selected ion monitoring
SPU	Seattle Public Utilities
SVE	soil vapor extraction
TCA	1,1,1-trichloroethane
TCE	trichloroethylene
UCMR 3	The Third Unregulated Contaminant Monitoring Rule
UGA	Upper Gravel Aquifer
USGS	U.S. Geological Survey
VCP	Voluntary Cleanup Program
VOC	volatile organic compounds
WAC	Washington Administrative Code

1. INTRODUCTION AND BACKGROUND

The Midway Landfill is a closed landfill previously operated by Seattle Public Utilities (SPU) from 1966 to 1983. The Landfill is located between Interstate 5 (east) and State Route 99 (west), and between South 245th Street (north) and South 252nd Street (south) in the City of Kent, Washington. Figure 1 displays the location of the landfill.

The Midway Landfill was placed on the National Priorities List (NPL) by the U.S. Environmental Protection Agency (EPA) in 1986. The Washington State Department of Ecology (Ecology) and the City of Seattle (City) entered into a consent decree regarding cleanup pursuant to Washington State Model Toxics Control Act (MTCA; Chapter 173-340 Washington Administrative Code [WAC]) regulations. In 2000, Ecology used a record of decision (ROD; EPA 2000) for the final cleanup action plan (CAP) of the site. The ROD required Institutional Controls (ICs) that include providing notifications to ensure that no water supply wells are constructed and used in "affected areas" downgradient of the landfill.

Groundwater monitoring results are being evaluated, in particular for the contaminants of concern identified in the ROD (manganese, 1,2-dichloroethene [1,2-DCE], and vinyl chloride). The chemical 1,4-dioxane was added to the groundwater quality monitoring program in 2005. 1,4-Dioxane has been found in several wells at the Midway Landfill at concentrations that exceed regulatory criteria. The ROD contains no cleanup level for 1,4-dioxane. The extent of the 1,4-dioxane plume at the Midway Landfill has not been fully delineated.

1.1 Objectives

The Third Five-Year Review (EPA 2015) issued the following Protectiveness Statement:

> *A protectiveness determination of the remedy at the Midway Landfill cannot be made at this time until further information on the extent of 1,4 dioxane is obtained. Further information will be obtained by additional water quality sampling downgradient of the site, either at existing and appropriately constructed wells identified by Ecology or by new wells installed for this purpose and by conducting a survey of the use of downgradient private wells.*

The goal of this report is to provide information to assist with the resolution of two issues and recommendations identified in the Third Five-Year Review:

1. *Issue: The extent of the 1,4-dioxane plume has not been delineated.*

   Recommendation: Ecology will do a search to determine the location of any wells constructed within a 1-mile radius of Midway Landfill, and

   1) *Identify the status of those wells (active, inactive)*
   2) *Determine the use (water supply/irrigation/monitoring/etc.)*
   3) *Compile well construction logs as available. Based on the well construction logs, Ecology will determine if any of these wells are constructed in a manner that would allow for water quality sampling that would allow further characterization and delineation of the contaminant plume downgradient of the site. If no existing wells can be confidently used for this purpose, Ecology will identify locations for new monitoring wells to delineate the extent of the 1,4 dioxane plume.*

2. *Issue: The extent of the 1,4-dioxane plume is unknown. It is therefore uncertain whether or not the ICs prohibiting water supply well drilling in "the affected area" are protective.*

Recommendation: Ecology will send out letters to all properties in a one-mile radius from Midway Landfill to determine if they contain a well, if that well is being used, and for what purpose (e.g. drinking water, irrigation, etc.). In the event that a property owner is actively using a well, Ecology will notify the owner of the potential risks immediately.

To address these objectives, this report first summarizes information for the chemical 1,4-dioxane, available data for 1,4-dioxane in groundwater, and possible sources of 1,4-dioxane other than Midway Landfill. Next, an updated well inventory is presented, and water level data from the wells are used to expand the knowledge of local hydrogeologic flow in the vicinity of the landfill. Based on the information presented, recommendations are presented for further characterization and delineation of the contaminant plume downgradient of the site.

1.2 Hydrogeologic Setting Summary

The groundwater conditions beneath the closed landfill are complex and as identified by the Remedial Investigation (RI) involve six different aquifers (Applied Geotechnology Inc. [AGI] 1988). Groundwater movement within and below the landfill has been characterized to an approximate depth of 300 to 350 feet below ground surface. A list of the identified aquifers monitored by the landfill is presented below, from shallowest to deepest:

- Perched Aquifer (also referred to as Shallow Groundwater)
- Landfill Aquifer (also referred to as Saturated Refuse)
- Upper Gravel Aquifer (UGA)
- Sand Aquifer (SA)
- Southern Gravel Aquifer (SGA)
- Northern Gravel Aquifer (NGA)

The Perched Aquifer (PA; also referred to as Shallow Groundwater) was initially identified as shallow, discontinuous lenses of groundwater perched above low permeability sediments above the UGA. However, subsequent characterization has shown the groundwater is not always perched and generally occurs north of the landfill.

The Landfill Aquifer (LA; also referred to as Saturated Refuse) consists of leachate within the landfill occupying the former gravel pit. Leachate from the saturated refuse discharges vertically into the UGA and SA, with the majority of flow occurring within the south-central area of the former gravel pit.

The UGA is composed of silty and sandy gravel and is limited in horizontal extent. The aquifer is underlain by a discontinuous layer of silt, clayey silt, and silty sand known as the Upper Silt Aquitard. Groundwater flow in the UGA flows inwards towards the southern end of the landfill where groundwater vertically discharges into the underlying SA where the Upper Silt Aquitard is relatively thin, coarser-grained, or absent.

The SA is an area-wide aquifer composed of interbedded sands and silt below the Upper Silt Aquitard. Groundwater flow in the SA near the landfill is generally from northwest to southeast and south to north towards the southern end of the landfill, where groundwater discharges into a hydraulic sink. The hydraulic sink extends several hundred feet east of the landfill where contaminants migrate into the underlying Lower Silt Aquitard and Northern and Southern Gravel Aquifers. Contaminants believed to originate from sources upgradient of the Midway Landfill are present in the SA and likely flowing towards and under the landfill boundary creating comingling of plumes.

The SGA and NGA are the deepest stratigraphic units monitored by the landfill and occur at approximately the same elevation. The defining characteristic between the two units is that hydraulic heads in the NGA are approximately 100 feet higher in elevation than the SGA. The NGA occurs below the northern half of the landfill and extends further north and northeast with groundwater flow generally from north to south towards the SGA. The SGA occurs below the southern end of the landfill and extends further east, south, and west. An apparent groundwater mound is in the SGA below the southern end of the landfill formed by apparent discharge from the hydraulic sink in the Sand Aquifer. Groundwater then flows westerly and easterly away from the landfill, discharging to Puget Sound (west) and the Green River Valley (east) with some lesser amount of discharge vertically into deep aquifers (Parametrix 1988a).

Groundwater monitoring wells have been installed in 30 locations both upgradient and downgradient of the Midway landfill, with 56 different screen completions. Figure 2 displays the locations of the monitoring wells, and Table 1 displays their well completion details. Currently there are 44 operable monitoring wells, with four of those wells occasionally being dry. Historical records indicate there were originally two monitoring wells in the PA, one monitoring well in the LA, 15 monitoring wells in the UGA, 20 monitoring wells in the SA, eight monitoring wells in the NGA, and eight monitoring wells in the SGA.

1.2.1 Regional Aquifer Analysis

East of the Midway Landfill is the Green River Valley, which contains Quaternary alluvial (Qal) deposits serving as an Alluvial Aquifer (AA; PACE 2008). Two alluvial aquifers are located in this area: one shallow and one deep system, separated by a low permeability unit. As noted above, the NGA and SGA discharge to the alluvial aquifers east of the landfill. The SGA and NGA also discharge vertically into a lower confining layer locally mapped as Quaternary pre-Olympia age non-glacial deposits (Qpon), Quaternary reversely magnetized non-glacial deposits (Qrn), and Quaternary undifferentiated deposits (Qu). A deeper aquifer occurs further below, but it is not monitored by the landfill. This aquifer is locally equivalent to the Federal Way Deep Aquifer (DA) system (Becker 1992) and generally occurs below sea level. Neither the AA nor the DA are monitored as part of the Midway Landfill monitoring well network.

The SA is equivalent to the U.S. Geological Survey (USGS) Aquifer unit A3 (Welch et al 2015), previously known as the Qva Aquifer (Woodward et al 1995). Locally, this aquifer is known as the Redondo-Milton Channel for Lakehaven Water and Sewer District (Becker 1992) and the Qva Aquifer for Highline Water District (Carollo 2016). The aquifer is a combination of Qva deposits and Quaternary pre-Fraser coarse-grained deposits (Qpfc). The SGA and NGA are equivalent to the USGS Aquifer unit C, previously known as the QAc Aquifer. Locally, this intermediate aquifer is known as the Mirror Lake Aquifer for Lakehaven Water and Sewer District and the QAc Aquifer for Highline Water District. The PA and UGA appear equivalent to the USGS unit A2 (Confining layer). The PA and UGA are not utilized by the nearby water districts for drinking water production.

1.2.2 Natural Surface Water Discharge Points

Three spring-fed creeks surround the landfill: Smith Creek and McSorely Creek to the west and Midway Creek to the east. Figure 2 shows the location of the creeks. These are natural discharge points of upland aquifers (Parametrix 1988a), particularly where the source aquifers are exposed at land surface. Geologic mapping indicates source deposits for the SA and SGA are exposed in McSorely and Smith Creeks to the west, and source deposits for the SA are exposed in Midway Creek to the east (Booth and Waldron 2004; Booth, Waldron and Troost 2004).

2. SUMMARY OF INFORMATION FOR THE CHEMICAL 1,4-DIOXANE

1,4-Dioxane is a synthetic industrial chemical and likely human carcinogen. It is often found at chlorinated solvent sites because it was used in the past as a stabilizer in certain solvents, paint strippers, greases, and waxes. Its most common use (approximately 90 percent) was as a stabilizer for 1,1,1-trichloroethane (TCA). 1,4-Dioxane is also used as a solvent or solvent stabilizer in the manufacturing and processing of paper, cotton, textile products, automotive coolant, brake cleaning sprays and fluids, cosmetics, and shampoos, and is a by-product in the manufacturing of polyethylene terephthalate (PET, polyester) plastic. The use of TCA was phased out in 1995 by the Montreal Protocol, and thus the use of 1,4-dioxane as a stabilizer largely ceased.

1,4-Dioxane is an emerging contaminant and little testing information exists for the chemical. EPA issued a technical fact sheet (EPA 2017a) about the chemical in November 2017 (Appendix A). 1,4-Dioxane's use is largely historical prior to 1995; however, testing for 1,4-dioxane still has not been completed at many release sites.

2.1 Fate and Transport

The specific gravity of 1,4-dioxane is 1.033 and the chemical is completely miscible in water. This means 1,4-dioxane tends to migrate downwards when released to the subsurface. Chlorinated solvents such as tetrachloroethene (PCE), trichloroethene (TCE), and TCA are only partly soluble in water and tend to stay as free phase liquids when released in large quantities. By contrast, 1,4-dioxane is completely soluble and therefore can migrate rapidly ahead and beyond its related solvent releases. At a hazardous waste site in Indiana with over 80 chemicals in groundwater, 1,4-dioxane was found to be the compound that traveled the greatest distance from the source area (Fetter 1993). This indicates that 1,4-dioxane can also be a tracer contaminant to identify total extent of impact from a source site.

Due to its solubility, 1,4-dioxane can penetrate low permeability zones where it can adsorb onto low permeability confining layers and slowly be released through the process of back diffusion into nearby aquifers (Adamson et al. 2016), prolonging the persistence of the contaminant. Recent investigations have shown that management of 1,4-dioxane contaminants can be difficult because of the rapid migration potential from the primary source release, as well as long-term management of secondary sources from back diffusion into aquifers.

2.2 Analysis and Treatment

Evaluating the occurrence of 1,4-dioxane in the environment is complicated by the fact that historically, detection limits were high using standard analytical methodology. Current methodology, EPA Method 522, using a solid-phase extraction with gas chromatography-mass spectrometry (GC/MS) and selected ion monitoring (SIM) can provide detection levels as low as 0.02 µg/L.

Despite the difficulties in finding and analyzing 1,4-dioxane, once found in the environment there are various treatment options to remove the chemical. These include pump and treat remediation (with ex situ treatment); injection of chemical oxidation adjuncts (e.g., Persulfox® from Regenesis®); microbial degradation by enhanced or engineered in situ bioremediation; in-well technologies such as a combination of air-sparging, air-stripping, and soil vapor extraction (SVE); and groundwater pumping (e.g., Accelerated Remediation Technologies [ART]-in-well integrated technologies).

2.3 Regulatory Criteria

Exposure studies have shown that 1,4-dioxane is a likely human carcinogen, and exposure from release sites is primarily through ingestion of contaminated drinking water. 1,4-Dioxane is easily metabolized in the body and is then eliminated in urine. 1,4-Dioxane exposure can also occur through inhalation from indoor air, particularly during bathing and showering.

A federal or state Maximum Contaminant Level (MCL) has not been established for 1,4-dioxane. The Washington state water quality standard for groundwaters in the state of Washington (Chapter 173-200-040 WAC) for 1,4-dioxane is 7.0 µg/L. However, Ecology has established a MTCA Method B cleanup level of 0.4375 µg/L for 1,4-dioxane. Compliance for the Midway Landfill is currently being evaluated using the more conservative MTCA Method B cleanup level of 0.4375 µg/L.

3. SUMMARY OF DATA FOR 1,4-DIOXANE IN GROUNDWATER

3.1 Midway Landfill Monitoring Well Data

1,4-Dioxane has been included in groundwater chemistry monitoring of the landfill since 2005, after it was requested by EPA following the First Five-Year Review (Ecology 2005). Figure 2 displays the locations of the monitoring wells for the landfill, and Figure 5 shows the wells currently being monitored for water quality. Initially, three monitoring wells, MW-14B, MW-17B, and MW-21B were monitored from 2005 to 2010. These data showed all three wells had concentrations of 1,4-dioxane above MTCA Method B cleanup levels, with concentrations ranging from 2.3 µg/L to 22 µg/L. These three wells are completed in two different aquifers: the SA and SGA (AGI 1988, 1990; Parametrix and EHS-International [EHSI] 2018). Wells MW-17B and MW-21B are upgradient of the landfill in the SA, and well MW-14B is downgradient of the landfill in the SGA.

Beginning in 2011, 1,4-dioxane was added to the testing program for the nine other routinely monitored wells (MW-16, MW-21A, MW-7B, MW-8B, MW-15A, MW-20B, MW-23B, MW-29B, and MW-30C) as requested in EPA's Second Five-Year Review (EPA 2010). The chemical was found above the MTCA Method B cleanup level in all but three wells (MW-16, MW-21A, and MW-8B). Wells MW-16 and MW-21A are completed in the UGA and well MW-8B is completed in the SA. In 2011, the highest concentration of 1,4 dioxane was found to be 53 µg/L at well MW-20B located in the SGA on the southwestern side of the landfill.

The MTCA Method B cleanup level for 1,4-dioxane was reduced from 7.95 µg/L to 0.4375 µg/L in April 2011. Prior to May 2012, the reporting limit for 1,4-dioxane was 2.0 µg/L. Beginning in May 2012, groundwater samples were analyzed using methodology that provided a reporting limit of 0.4 µg/L to allow comparison of 1,4-dioxane levels with the 0.4375 µg/L MTCA Method B cleanup level.

In May 2012, five additional upgradient wells were tested for 1,4-dioxane (MW-8A and MW-27B in the UGA, and MW-11A, MW-18A, and MW-28 in the SA) to evaluate the possibility that the 1,4-dioxane detected in downgradient wells could be associated with the same source or sources of the volatile organic compounds (VOCs) detected upgradient of the landfill (Parametrix 2012). VOCs had been detected in wells MW-17B and MW-21B upgradient of the Midway Landfill, and MW-21B had shown an increasing trend of VOC concentrations, including PCE, TCE, and 1,1-dichloroethene (1,1-DCE). The results of the May 2012 sampling indicated that 1,4-dioxane was not detected in the additional five upgradient wells.

Since 2012, 1,4-dioxane has been monitored annually (Parametrix and EHSI 2018). Table 2 displays the historical concentrations of 1,4-dioxane for the Midway Landfill monitoring wells. The concentrations of 1,4-dioxane (Figure 4) have decreased substantially since monitoring began. The most substantial decreases have been observed in SGA well MW-20B, where the concentrations decreased from 53 µg/L in 2011 to under 13 µg/L in 2019. All concentrations are currently below the 7.0 µg/L Washington state water quality groundwater standard except SGA wells MW-14B, MW-20B, and MW-29B. However, concentrations in upgradient wells MW-17B and MW-21B in the SA, and downgradient wells MW-7B in the SA and MW-14B, MW-20B, MW-23B, MW-29B, and MW-30C in the SGA remain above the MTCA Method B cleanup level of 0.4375 µg/L (Figure 5).

The known contaminant plume of 1,4-dioxane determined to date extends from west of Pacific Highway South and east-southeasterly to MW-30C near Reith Road (Figure 5). The upgradient and downgradient extent of the plume have not been fully delineated.

It should be noted that concentrations of 1,4-dioxane are greater within the SGA (MW-14B, MW-20B, MW29B, MW-30C) compared to the upgradient and overlying SA wells (MW-17B and MW-21B; MW-7B) and UGA wells (MW-16 and MW-21A), which is consistent with the nature of 1,4-dioxane being a dense miscible fluid that migrates rapidly away from the source.

3.2 Previous Monitoring of Drinking Water Wells Near Midway Landfill

Four domestic wells were historically sampled in 1989 (AGI 1990). Three of the wells were from the 1988 well inventory and identified as well 1 (Sharick domestic well), well 5 (Hayett Group B), and well 6 (Fenwick Group B). These wells were located primarily in the Lake Fenwick area southeast of the landfill. The fourth well sampled was similarly from the well inventory (well 13) but is referred to as PW-1 (Kraft Well) as it was also used in delineation of the hydrostratigraphy as part of the RI. The Kraft well is located in the Reith Road area east of the landfill.

1,2-DCE and vinyl chloride were not detected in any of the four wells. Manganese was not detected in the two wells analyzed (Sharick and Hayett). 1,4-Dioxane was not tested in the samples at that time, as it was not a known contaminant of concern.

Historical investigations found that the primary migration pathway to the Lake Fenwick area was through the SGA and Wells MW-30A/B/C were drilled near the intersection of South 253rd Place and 38th Avenue S (T22N/R04E Section 22) and completed in the SA and SGA (Figures 2, 3, and 5) as an early warning well should contaminants migrate towards the Lake Fenwick area (AGI 1990). The potential migration pathways of 1,4-dioxane with respect to wells within 1 mile of the landfill are discussed further in Section 6 of this report.

3.3 Washington State Department of Ecology EIM Database

Ecology's Environmental Information Management (EIM[1]) database contains data for various types of sites in the state of Washington, including voluntary and formal cleanup sites, sediments, stormwater, Ecology grant and loan recipients, and landfill and biosolids groundwater monitoring. The EIM database was reviewed for 1,4-dioxane data, and as of July 2019 had a total of 33 cleanup sites with data submitted to Ecology, for a total of 4,075 groundwater samples. Table 3 summarizes the 1,4-dioxane data for the 33 sites. Figure 6 shows the location of these sites relative to the Midway Landfill.

1,4-Dioxane was detected in 1,466 of the 4,075 samples analyzed, or nearly one-third of all the samples. Twenty-one of the 33 sites had no detections of 1,4-dioxane; however, detection levels reported for the analysis of the contaminant in the 33 studies ranged from 0.16 µg/L in recent studies up to 2,500 µg/L in older studies (Table 3). The 12 sites with detections of 1,4-dioxane are as follows:

- Three are landfill sites (Colbert, Pasco and Sisco Landfill)
- Six sites are metals and industrial cleaning services facilities
- One site is an abandoned mine (disposal of industrial cleaning services waste)
- Two sites are marine shipyards/rail yards/junkyards

[1] Washington State Department of Ecology (Ecology) – EIM Database. Available at: https://fortress.wa.gov/ecy/eimreporting/.

None of the sites are near the Midway Landfill. A large proportion of the data were collected at a limited number of sites, in particular the Phillips Corporation sites in the Georgetown neighborhood of Seattle, the city of Tacoma, and the city of Washougal. Concentrations of 1,4-dioxane of up to 1,100 µg/L were reported at the Georgetown site.

3.3.1 Other Landfill Sites

Further analysis is presented for landfill sites where 1,4-dioxane has been tested in the state of Washington to provide a comparison to the findings at Midway Landfill. 1,4-Dioxane is known to be present in both household and industrial wastes; therefore, buried waste landfills are likely sources of the contaminant.

The EIM database indicates that the Colbert Landfill site, located in Spokane County, had detections of 1,4-dioxane up to 97 µg/L. This landfill operated between 1968 and 1986, and during a five-year period between 1975 and 1980 the landfill accepted solvent and other chemical waste from a local manufacturing company, Key Tronic Corporation, and Fairchild Air Force Base (U.S. Army Corps of Engineers [Corps] 2014). In 1983, EPA placed the Colbert Landfill on its NPL. In 1988, a Remedial Investigation/Feasibility Study (RI/FS) was conducted and chlorinated organic solvents including TCA, 1,1-DCE, TCE, and PCE were detected in groundwater near the landfill. The RI/FS recommended a pump and treat system, which came online in May 1994. 1,4-Dioxane was first tested in 2005 and was detected in monitoring wells at concentrations of approximately 20 µg/L, but concentrations decreased to less than 5 µg/L by 2014. In 2006, 1,4-dioxane was also found in concentrations of up to 13 µg/L in the nearby North Glen Water Association well (DOH 2006).

The Sisco Landfill operated primarily as a wood waste and inert waste landfill site in Snohomish County between 1978 and 1984. Some industrial waste was disposed in the landfill by Bayliner, and undocumented and unknown source wastes were also disposed (PES Environmental 2011). The EIM database indicates that the landfill had reported detections of 1,4-dioxane ranging from 37 to 75 µg/L in 2010, although no more recent 1,4-dioxane data for this site are available. A 2012 Ecology opinion letter stated that the landfill site needs further characterization.

The EIM database shows that 1,4-dioxane testing has been conducted at four other landfill sites in Washington state: Hansville, Olympic View, Pasco, and Roosevelt. However, some of the reporting limits were too high to determine compliance with the MTCA B criterion, as follows:

- The Hansville Landfill analysis of 1,4-dioxane completed between 2012 and 2018 reported detection levels from 9.3 to 40 µg/L, which are well above the MTCA Method B limit. Hansville Landfill has vinyl chloride in groundwater (SCS Engineers 2017a); therefore, associated 1,4-dioxane could be present.
- The Olympic View Landfill analysis of 1,4-dioxane completed between 2011 and 2017 had similar detection levels from 9.3 to 40 µg/L. Olympic View Landfill has TCE and vinyl chloride in groundwater (SCS Engineers, 2017b); therefore, associated 1,4-dioxane could be present.
- The Pasco Landfill analysis of 1,4-dioxane completed between 1998 and 2013 had reported detection levels from 0.2 to 5 µg/L, with two detections. The Pasco Landfill has PCE and daughter products present in groundwater (PBS Engineering and Environmental 2018); therefore, associated 1,4-dioxane could be present.
- The Roosevelt Landfill analysis of 1,4-dioxane completed in 2014 was very limited. Seven samples were collected, and the detection level was reported at 200 µg/L. The Roosevelt Landfill is currently operated by Republic Services. The site is listed on Ecology's Confirmed and Suspected Contaminated Sites List (CSCSL) databases, and no reports are currently available

online. Republic Services (2018) indicates that 1,500 feet separate the bottom of the landfill from the closest regional aquifer; therefore, the likelihood that 1,4-dioxane contamination is present in groundwater is low.

3.4 U.S. Environmental Protection Agency Results for Public Water Systems

The 1996 Safe Drinking Water Act amendments require that EPA issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems once every 5 years. The Third Unregulated Contaminant Monitoring Rule (UCMR 3) was published in 2012, which required monitoring for 28 contaminants and two viruses between 2013 and 2015 (EPA 2012a, 2016; see Appendix B). 1,4-Dioxane was included in the Assessment Monitoring (List 1 Contaminants) on the UCMR 3 list. EPA established a minimum reporting level of 0.07 µg/L for 1,4-dioxane using approved EPA Method 522. EPA's reference concentration (de facto national compliance level) for the study was reported at 0.35 µg/L.

3.4.1 Nationwide

Monitoring results under the UCMR 3 indicated that, for the entire United States, 36,810 samples were analyzed for 1,4-dioxane (EPA 2017b). The chemical was found above the EPA reference concentration of 0.35 µg/L in 1,081 (2.9 percent) of the samples. This is the second-highest rate of exceedance above the EPA's chemical-specific reference concentrations for all the UCMR 3 contaminants. This high rate of detection of 1,4-dioxane is likely related to its mobility and historical widespread use.

3.4.2 State of Washington

The Washington State Department of Health (DOH) is the lead agency for drinking water testing within the state of Washington. DOH establishes the drinking water standards and testing requirements for Group A and Group B drinking water systems that provide drinking water to multiple households. As noted above, the Washington state water quality standard for groundwaters of the state of Washington for 1,4-dioxane is 7.0 µg/L. However, under the UCMR 3 criteria, water systems would likely require additional testing if found above the EPA reference concentration of 0.35 µg/L. Table 4 summarizes the 1,4-dioxane data from UCMR 3 sampling for the state of Washington. A total of 1,036 samples were collected from Group A drinking water systems (wells and springs) in the state of Washington during the required initial monitoring from 2013 to 2015 (DOH[2]). Of the 1,036 samples collected, only 13 sources had detections of 1,4-dioxane. Detections ranged from 0.072 µg/L up to 0.36 µg/L, below the MTCA Method B cleanup level of 0.4375 µg/L and below the groundwater quality criterion of 7.0 µg/L.

Ten of the 1,4-dioxane detections in Group A water systems occurred near Vancouver, in Clark County, and were likely related to historical pulp and paper mills. Three detections of 1,4-dioxane just above the detection level (0.073 to 0.077 µg/L) were observed in Lacey, Fredrickson, and the east Renton Highlands.

3.4.3 Results of 1,4-Dioxane Testing near Midway Landfill

Figure 7 displays the location of the nearest Group A water wells surrounding the Midway Landfill. As shown on the figure, all Group A systems in the area surrounding the landfill that were tested had no detections of 1,4-dioxane (less than 0.07 µg/L). Based on the results of the EPA's UCMR 3 testing, it does

[2] Washington State Department of Health (DOH) – Office of Drinking Water. Available at: https://fortress.wa.gov/doh/eh/portal/odw/si/Intro.aspx.

not appear that DOH requires any Group A or Group B systems near the Midway Landfill to continue to test for 1,4-dioxane in their routine water quality monitoring.

The three Group A systems closest to the landfill (the Kent Riverbend Golf Course Irrigation Well, King County Water District 54, and the Logandale Water Association) were not tested during the UCMR 3 data collection period. However, King County Water District 54 wells and the Logandale well are not located downgradient of the landfill. The Kent Riverbend Well is used for irrigation only, and therefore likely does not require testing for unregulated contaminants by EPA or DOH. The Kent Riverbend Well is east of the landfill in a lower zone of the AA. As discussed in Section 1, the NGA/SGA system likely discharges easterly to the upper portion of the AA in this area.

4. POTENTIAL OTHER SOURCES OF 1,4-DIOXANE NEAR MIDWAY LANDFILL

In 2017, an Environmental Database Search surrounding the Midway Landfill was completed to identify potential neighboring solvent release sites. A copy of the EDR® Radius Map report is provided in Appendix C. As discussed above, 1,4-dioxane is found as a stabilizer at dry cleaning facilities, in automotive degreasers at auto repair facilities, and as a by-product of plastic manufacturing. Table 5 in the EDR® report summarizes the nearby sites that were historically used for these functions. Figure 8 displays the locations of these sites, which include Northwest Powder Coatings, the Hauser Property, Japanese Auto Sales and Service, Midway Cleaners, Cleaners 1, the Floyd R Hunt Site, Davis Construction, Redondo One Hour Cleaners, Midway Classic Cleaners, Cho Kee, SeaTac Transmission Repair, Skip's Auto Rebuild, Cape Cruiser Boat Works, RS Color & Design/Abra Auto Body, Scooters Performance/Bow Wow, American Tire & Equipment, the Washington National Guard, Midway Muffler & Radiator, Production Plastics, Inc., and Busy Bee Dry Cleaners.

Seven of the sites have documented releases of chlorinated solvents (PCE, TCE, TCA, and vinyl chloride) into the environment (Northwest Powder Coatings, Hauser Property, Japanese Auto Sales and Service, Midway Cleaners, Cleaners 1, Floyd R Hunt, and Davis Construction). Two of the sites have "No Further Action" status from Ecology (Floyd R Hunt and Davis Construction). Available Ecology[3] records suggest that 1,4-dioxane has not been studied at any of these five remaining active chlorinated solvent release sites. As shown on Figure 8, a cluster of several documented chlorinated solvent release sites is located immediately northwest of the Midway Landfill near the intersection of S 246th Street and Pacific Highway South.

In 2008, Parametrix reviewed Ecology files for the Midway Cleaners site located at 23647 Pacific Highway in Kent, Washington (Figure 8) to evaluate its status as a possible source for the VOCs detected at Midway Landfill (Parametrix 2008). Midway Cleaners is located approximately 2,500 feet north of the Midway Landfill and is a CSCSL site with chlorinated solvent impacts known to soil and groundwater. PCE concentrations of up to 110,000 µg/L were historically found at the site, which suggests the possible presence of dense non-aqueous phase liquid (DNAPL). The site is currently in Ecology's Voluntary Cleanup Program (VCP); however, the recently completed Remedial Investigation (Farralon 2018) shows no data for vinyl chloride, TCA, or 1,4-dioxane, and the extent of the investigations was limited to 70 feet below ground, or equivalent to perched zones within the UGA. Due to the nature of chlorinated solvent migration pathways, potential contribution of contaminants from this known CSCSL site to the Midway Landfill plume remains uncharacterized. 1,4-Dioxane is an emerging contaminant and may be added to future monitoring requirements by Ecology. Midway Cleaners is currently seeking an opinion on the Remedial Investigation (RI) of the site through Ecology's VCP; therefore, 1,4-dioxane may be added to future monitoring requirements.

Ecology records for Northwest Powder Coatings (Figure 8) are not available online and would require a file review at Ecology Northwest Regional offices in Bellevue. Ecology records for the Hauser Property/Davis Construction site show the site remains contaminated primarily with total petroleum hydrocarbons and lead (Ecology 2012). Halogenated organics are suspected in soil and groundwater below the site but have not been investigated to date.

[3] Washington State Department of Ecology (Ecology) – Cleanup Site Search, available online at https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx.

The Japanese Auto Sales property (Figure 8) does not appear to have been investigated; however, Ecology records indicate a spill of petroleum hydrocarbons and ethylene glycol occurred in 2004 with impacts to soil (Ecology 2004; Environmental Report Tracking System Number 539475). 1,4-Dioxane is a related chemical to ethylene glycol through its production; however, the date of the release in 2004 and the nature of the spill suggests this site is not a major contributor to the Midway Landfill contamination plume.

The Cleaners 1 site is located approximately 2,500 feet south of the Midway Landfill (Figure 8). Ecology records indicate PCE and daughter products were spilled from a historical dry cleaner and impacted soil, groundwater, and vapor (Ecology 2010). The site completed interim cleanup actions addressing the groundwater impact but remains open and active due to soil and vapor migration pathways. 1,4-Dioxane testing was not completed when addressing the groundwater impacts at the site.

The twelve sites suspected as historical or current solvent use sites (Cho Kee, SeaTac Transmission Repair, Skip's Auto Rebuild, Cape Cruiser Boat Works, RS Color & Design/Abra Auto Body, Scooters Performance/Bow Wow, American Tire & Equipment, the Washington National Guard, Midway Muffler & Radiator, Production Plastics, Inc., and Busy Bee Dry Cleaners, shown in Table 5) do not appear to have been investigated for chlorinated solvents or 1,4-dioxane. The historical plastic manufacturer, Production Plastics Inc. at 24602 Pacific Highway S, and the historical dry cleaner, Midway Classic Cleaners at 24860 Pacific Highway S, which have not been investigated to date or reported to Ecology, are immediately adjoining the landfill (Figure 8) and may have solvent releases and associated contaminants such as 1,4-dioxane.

The presence of these confirmed and suspected solvent release sites complicates the determination of the nature and extent of releases of chlorinated solvents and 1,4-dioxane from the Midway Landfill. There may be undocumented comingling of contaminant plumes complicating analysis of compliance for the landfill with 1,4-dioxane and ROD contaminants. However, 1,4-dioxane is an emerging contaminant and the timeline of testing at these sites is largely unknown, with testing requirements as determined by Ecology. Further data are likely to be obtained in the future as Ecology begins to require more cleanup sites to test for the emerging contaminant.

5. UPDATED WELL INVENTORY

Since the RI, the City of Kent and Highline Water District have provided public water supply to most households and businesses near the landfill. The well inventory has been updated for an approximately 1-mile radius surrounding the Midway Landfill, and the current status of groundwater use for those remaining households or businesses not supplied by public drinking water has been evaluated.

5.1 Methodology

We reviewed groundwater well databases available from the Ecology Well Report Viewer database, the DOH Drinking Water Division, King County Water and Land Services, the Washington State Water Supply Bulletin No. 28 (Luzier 1969), Water-Resources Investigation 92-4098 (Woodward et al. 1995), and the previously completed well inventory. Wells in the database were numbered following the State of Washington well numbering system which identifies each well based on its location in a township, range, section, and 40-acre tract (See Page vii of Welch et al 2015 for further information)

The first step in the process was to develop a table of water supply wells in the vicinity of the landfill, including depth, surface elevation, screen interval (if available), well log availability, depth to water, and source of the information. A resource protection well search was also completed from the Ecology Well Report Viewer database for a 1-mile radius surrounding the landfill.

We then evaluated the well inventory database to determine the potential source aquifer. The likely source aquifer for each well was determined largely by its completion elevation, physical location, and neighboring wells. For wells completed in the Alluvial Aquifer, aquifer determinations were based on position within the Green River Valley. For upland areas, the source aquifer completions were determined based on elevations as follows:

- UGA – completion elevations greater than 240 feet above sea level
- SA – completion elevations between 240 feet above sea level to 120 feet above sea level
- SGA/NGA – completion elevations between 120 feet above sea level to sea level
- DA – completion elevations below sea level

Subsequently, we attempted to determine the current use of the wells. For Group A and Group B systems, this was determined by reviewing available active vs. inactive status of wells from DOH. For domestic wells, we reviewed King County parcel information by address matching to determine public or private water supply. For domestic wells where public water supply was available but where historical wells were placed, we reviewed current aerial and planar photographs of the properties to determine if wellhouses or wellheads were visible. We also reviewed potential septic system as-built information from the Seattle-King County Public Health Department, as the as-builts generally include water supply. Finally, we contacted the City of Kent Public Works Department to determine water connections for properties in the Lake Fenwick and Frager Road areas (Riege 2018). For all wells, we also searched for decommissioning well logs from Ecology. First hand verification of well uses with well owners was not in the scope of this study.

Wells designated as “active” through the sources noted above have been identified as “in-use.” We separated wells designated as “inactive” into two categories: “potentially in-use,” and “not in-use.” The wells were also evaluated to determine whether they are operable to the extent that this information is available.

5.2 Previous Water Well Inventory

A previous water well inventory was completed by Parametrix in 1988 as part of the Midway Landfill Remedial Investigation (Parametrix 1988b). A copy of the previous well inventory is provided in Appendix D.

The wells were identified according to their use as follows (Revised Code of Washington [RCW] 70.119A.020):

- Group A water supply wells provide drinking water to 15 or more connections, or more than 25 people.
- Group B water supply wells provide drinking water to 15 or fewer connections, and no more than 25 people.
- Group D, or domestic wells, provide drinking water to one connection or household.

At the time of the RI, 32 wells were reported within 1 mile of the landfill. Nineteen of the 32 wells were reportedly operable. However, only nine wells were reportedly in use. No Group A wells were reported in use, two Group B wells were in use, three domestic wells were in use for drinking water, and four domestic wells were being used for irrigation. As discussed in Section 3.2, both Group B wells identified in the RI were sampled in 1989 (Wells 5 and 6 from the well inventory), along with two additional domestic wells (Wells 1 and 13 from the well inventory).

5.3 Updated Water Well Summary

Table 6 shows information for the wells within 1 mile of the landfill. Figure 9 displays the location of each of the water wells located within 1 mile, as well as the Midway Landfill monitoring wells, and the source aquifer for each well is identified. Water wells in-use or potentially in-use are identified, and for water wells that are not in-use, it is noted whether they are known to be operable. Copies of information available for each well (such as well logs, water rights, DOH data, and parcel information) are provided In Appendix E.

A total of 44 water wells were identified within 1 mile of the landfill. For all the wells within 1 mile (44), the following apply:

- Three wells were completed in the AA
- Seven wells were completed in the UGA
- Sixteen wells were completed in the SA
- Fourteen wells were completed in the NGA/SGA
- Four wells were completed in the DA

Of the 44 wells, eight were determined to be in-use or potentially in-use and an additional five wells were determined to be operable or potentially operable. The remaining 31 wells were determined to be not in-use and inoperable. For the 12 in-use, potentially in-use, or not in-use but potentially operable wells, the following apply:

- Two wells are completed in the AA
- Three wells are completed in the UGA
- Four wells are completed in the SA
- Three wells are completed in the SGA

Table 7 displays details for the wells that are in-use, potentially in-use, or not in-use but potentially operable. Of the eight wells in-use or potentially in-use, one is the Group A Kent Riverbend Well (22J2; discussed in Section 3.4.3), two are domestic wells used for drinking water (22A2 and 22H1), and five are domestic wells used for irrigation (21P1, 22Q1, 22Q2, 22Q3, and 29A2). Another four domestic wells (21C1, 21F1, 27A3, and 28G6) are potentially operable. Key characteristics of these 12 wells including likely aquifer and hydraulic position with respect to the landfill (see Section 6) are summarized in the table below.

Operable or Potentially Operable Water Wells within one Mile of Midway Landfill

Well	Name	Well Type	Likely Aquifer	Use	Operable?	Hydraulic Position with Respect to Landfill
21C1	Stoner	Group D	SA	Not in use	Covered but operable	Cross-gradient
21F1	Marcus Whitman Church	Group D	SA	Not in use	Covered but operable	Cross-gradient to Downgradient
21P1	Strange	Group D - Irrigation	UGA	Potentially in use	Likely	Upgradient
22A2	Stearns	Group D	AA	Potentially in use	New well	Cross-gradient to Downgradient
22H1	Eckland	Group D	SGA	In use	Yes	Cross-gradient to Downgradient
22J2	Kent Riverbend 1R	Group A - Irrigation	AA	In use	Yes	Downgradient
22Q1	Riefschnider	Group D - Irrigation	SGA	Potentially in use	Unknown	Downgradient
22Q2	Kraft	Group D - Irrigation	SA	Potentially in use	Unknown	Downgradient
22Q3	Book	Group D - Irrigation	SA	Potentially in use	Likely	Downgradient
27A3	Huddleston	Group D - Irrigation	SGA	Not in use	Yes	Cross-gradient to Downgradient
28G6	Rost	Group D	UGA	Not in use	Yes	Upgradient
29A2	Meeker	Group D - Irrigation	UGA	In use	Yes	Upgradient

5.3.1 In-Use or Potentially In-Use Wells

Based on the updated water well inventory, water wells being used for beneficial use within 1 mile of the landfill, for either drinking water supply or irrigation, are described below for three primary areas of interest surrounding the Midway Landfill: the Lake Fenwick and Frager Road/Reith Road Areas, Kent Valley, and the Midway Upland. The locations of these three areas are shown on Figure 9 and each well is further discussed in the sections below. The Kent Valley and Lake Fenwick areas have some areas without public drinking water availability whereas the Midway Upland and Frager Road/Reith Road areas are generally on public water supply systems with sources outside of the influence of the landfill.

5.3.1.1 Lake Fenwick and Frager Road/Reith Road Areas

Domestic Wells

In 2016, a well was drilled in T22N/R04E Section 22 (22A1/ Stearns Well, Figure 9) on a property on the edge of the Kent Valley, west of the Green River and east of Highway 516. Aerial photographs show a new residential structure completed on the property in 2018; therefore, it appears this well is intended

for domestic use. The well log shows a completion within the shallow alluvium (Upper AA) within the Kent Valley west of the Green River, which is near the natural discharge of the SGA to the AA.

An in-use domestic well adjacent to Highway 516 in T22N/R04E Section 22 (22H1, the Eckland Well) is located on the border of the Kent Valley and the Des Moines Upland. No well log details of the Eckland Well exist, but King County parcel information shows the residence is on the private water supply and Ecology water rights records show the well as a permit exempt domestic well. Based on its surface elevation of approximately 75 feet above sea level, the well is likely completed in a portion of the SGA.

Irrigation Wells

Three irrigation wells are potentially in-use on Reith Road near the City of Kent's Reith Road Water Tower (Figure 9). The Kraft Well (22Q2) was previously sampled during the RI and was being used for irrigation at that time. The property has been redeveloped since then, but no well decommissioning log is available in the Ecology database. The well is completed in the SA.

Just east of the Kraft Well is the Book Well (22Q3). No well log or water right information exists for this well, but it is visible from the roadway at the front of the property addressed at 4343 S 254th Street. The well appears to be used for irrigation, as a City water line is adjacent to it. Based on its proximity to the Kraft Well, this well is also likely completed within the SA.

The Riefschnider Well (22Q1) is located just east of these wells along the historical Reith Road and addressed at 4516 S 254th Street. The well was not previously sampled but was used in cross sections for the RI (AGI 1990). The RI stated that the well is an old private water supply well reported in Luzier, 1968 and is apparently no longer in existence, but that if this well existed, it would make an excellent downgradient monitoring point for the SGA. The well has an elevation of 255 feet and depth of 246 feet and is completed in the SGA. The property is listed on the public water supply, and a City water connection is visible from the roadway; therefore, the well is likely used for irrigation only.

5.3.1.2 Kent Valley

The Group A Kent Riverbend Well (22J2) is located just outside the 1-mile eastern radius of the Midway Landfill. The well is a replacement well drilled in 2016 to a depth of 465 feet below ground from an elevation of approximately 40 feet above sea level. Well log details show the well is completed within older deposits within the Green River Valley below a clay confining layer (Lower AA).

5.3.1.3 Midway Upland

The Midway Upland is served by the City of Kent, Highline Water District, King County Water District 54, and Lakehaven Water and Sewer District. There are no in-use drinking water wells in the upland sections of T22N/R04E Sections 15, 16, 20, 21, 22, 27, 28, and 29. However, potentially in-use domestic wells for irrigation are located in Sections 21 and 29.

Well 21P1, the Strange Well, is potentially in-use and used for irrigation. The well was reported as actively used for irrigation in the old well inventory and the property has not been redeveloped since that time. The well is at an elevation of 300 feet above sea level, but no completion details are available. Based on its location, it is likely completed in the UGA; however, it could also be completed in the SA or SGA.

Well 29A2, the Meeker Well, is potentially in-use for irrigation. The well was reported as actively used for irrigation in the old well inventory and has not been redeveloped. The well is at an elevation of 280 feet above sea level with a depth of 27 feet and completed in the UGA.

5.3.2 Additional Operable or Potentially Operable Wells

5.3.2.1 Lake Fenwick and Frager Road/Reith Road Areas

Well 27A3 (Huddleston Well) is in the northern Lake Fenwick Area southeast of the Midway Landfill and MW-30C. The well is reportedly 120 feet deep from a wellhead elevation of approximately 200 feet above sea level and completed in the SGA. The house, built in 1959, is connected to the public water supply, but the well is likely still operable as was reported in the previous well inventory.

5.3.2.2 Midway Upland

Well 21C1, the Stoner Well, is not in-use, covered, and believed to be operable. The well is at an elevation of 225 feet above sea level and a well depth of 36 feet completed into the SA. This well is positioned west of the groundwater divide in the SA (Woodward et al. 1995).

Well 21F1, the Marcus Whitman Church Well, is covered but operable. The well is at an elevation of 265 feet above sea level and likely completed in the SA. The well is located west of MW-25.

5.4 Resource Protection Wells

Table 8 is a summary of the resource protection wells within 1 mile of the landfill, and their locations are shown on Figure 10. As shown on the figure, most sites occur along the Pacific Highway corridor and main arterials leading to the historical highway. Many sites have multiple wells, so the deepest well depth at each location is presented in the table. As shown on Table 8, only five sites have resource protection wells completed deeper than 100 feet below ground. Therefore, although many resource protection wells surround the landfill, most are completed within shallow perched aquifers (PA or UGA) and likely would not be useful to characterize the contaminant migration extent downgradient of the landfill specifically in the SA or SGA. However, some wells could be useful to characterize the UGA upgradient of the landfill, especially surrounding confirmed or suspected solvent release sites.

6. UPDATED GROUNDWATER FLOW ANALYSIS

Historical groundwater flow analysis completed at the landfill has primarily been limited to data measured in the monitoring wells. To evaluate the flow in the area of the landfill within a more regional context, the water well inventory was updated for an approximately 2-mile radius of the Midway Landfill and groundwater flow maps for the UGA, SA, and SGA were developed using available water level data from these wells. The hydraulic analysis completed for this investigation partially relies upon the hydrogeologic interpretations for the completion aquifers of the Midway Landfill monitoring wells developed for the RI (AGI 1988).

Table 9 displays the additional wells within approximately 1 to 2 miles from Midway Landfill that were used for the groundwater flow analysis. Tables 6 and 9 combined show a total of 81 water wells within the approximate 2-mile vicinity of the Midway Landfill used for the flow analysis. Of these wells, 11 wells are completed in the AA, 10 wells are completed in the UGA, 24 wells are completed in the SA, 28 wells are completed in the NGA/SGA, and 8 wells are completed in the DA.

The water levels from the well database were collected at various times; therefore, the maps developed do not project a current state of the groundwater surface. However, this information is useful in projecting the potentiometric surface surrounding the Midway Landfill overall to allow for understanding historical contaminant migration, fate, and transport as well as human health concerns in the aquifers.

6.1 Methodology

As noted in Section 5.1, the likely source aquifers for wells in Tables 6 and 9 were determined largely by their completion elevation, physical location, and neighboring wells.

Following development of the source aquifer database, wells with available water level information were compiled and plotted with available Midway Landfill monitoring water level data collected during the RI (1987 to 1989) for each aquifer: UGA, SA, and SGA/NGA. For the purposes of this assessment, the SGA/NGA are combined to correspond with the regional intermediate/sea level aquifer system referred to as the C Aquifer (Welch et al. 2015). The SA is the regional shallow aquifer (A3 Aquifer), and the UGA is the regional perched aquifer (A1/A2 Aquifer/Confining Unit).

Some of the monitoring well locations have multiple completions reported for the same aquifer. In the updated hydraulic flow analysis, the lower head water levels were utilized assuming a fully screened well would likely equilibrate to the lower head. The only exception was at the MW-30A/30B location. The screen elevation of well MW-30A is equivalent to the SA above the lower silt aquitard, whereas MW-30B is completed below the lower silt aquitard and is believed to be in hydraulic continuity with the SGA.

6.2 Upper Gravel Aquifer

Figure 11 displays the groundwater flow in the UGA. As noted on the figure, groundwater within the UGA is perched and discontinuous horizontally along the upland. The potentiometric contours show the likely hydraulic head and direction of groundwater flow in areas where the UGA is present. As shown on the figure, a small saddle of lower hydraulic head is located at the southern end of the landfill with discharge likely westerly and easterly off the upland. Two wetland areas are depicted on the map that are likely hydraulically connected to the UGA. The first is the Parkside Wetland, located west of the landfill at the source area of Smith Creek. The second is south of 259th street, approximately 2,300 feet south of the Midway Landfill, and is a source area for McSorely Creek. The UGA hydraulic head appears to closely resemble the topography of the area. An area of lower hydraulic head is located below the southern end of the landfill where the UGA drains into the underlying SA because the underlying Upper Silt Aquitard is discontinuous (AGI 1988).

6.3 Sand Aquifer

Figure 12 displays the groundwater flow in the SA. As shown on the figure, the saddle of lower hydraulic head is much wider in the SA than in the UGA near the southern end of the Midway Landfill. Groundwater migrates north into the saddle from the south, and south into the saddle from near the Midway Landfill. It then discharges west to McSorely Creek and east to Midway Creek. There also is a likely southeast discharge towards the Lake Fenwick Area in the SA due to a large surficial deposit of the Quaternary Vashon Advance Outwash (Qva; Tabor, Booth, and Troost 2014).

6.4 Northern and Southern Gravel Aquifer

Figure 13 displays the groundwater flow within the NGA and SGA. As shown on the figure, a lower hydraulic head saddle occurs near the southern end of the Midway Landfill. Groundwater migrates southerly from the Midway Landfill, then discharges west to McSorely Creek and east towards the Green River Valley. The hydraulic head gradient within the NGA/SGA system is quite drastic, with over 100 feet in variation between north of the landfill and south within the saddle. This likely is related to the level of confinement of the aquifer. As noted in the RI, the silt overlying the SGA near the landfill is discontinuous, leading to less-confined conditions and a lower hydraulic head.

6.5 Updated Groundwater Migration Pathways

The updated groundwater migration pathway interpretations in the UGA, SA, and NGA/SGA are generally consistent with previous determinations presented in the RI. The previous interpretation (AGI 1990) indicated the presence of a hydraulic sink in the SA beneath the southern portion of the landfill and extending eastward toward a low point at MW-23A. Under that interpretation, “contaminated groundwater entering the sink’s radius of influence from the west and northwest cannot escape to the east but must flow vertically downward into the underlying SGA. Actual flow paths are substantially more complicated, and some groundwater likely flows laterally to the east within the SA rather than directly downward into the SGA.” Additional data collected during installation of well MW-30C confirmed that “groundwater flows to the east and west away from a mound located near the eastern border of the landfill” but “also suggest groundwater east of the ridge flows slightly to the northeast. This is significant in that contaminated groundwater originating at the landfill is even less likely to reach Lake Fenwick than previously thought.”

The interpretation presented in this report using groundwater elevation data from a 2-mile radius surrounding the landfill indicates that instead of a hydraulic sink, a lower hydraulic head saddle is present in all three aquifers near the southern end of the landfill where groundwater then migrates west and east across the upland groundwater divide towards either Puget Sound or the Green River Valley. Due to the westward flow within the SA in the southern portion of the site shown by the updated analysis, the westerly component of groundwater flow with the UGA, SA, and SGA/NGA may be greater than previously considered. This updated interpretation appears to correlate with the regional aquifer studies (Welch et al 2015; Woodward et al 1995) which show a lower head saddle within the groundwater divide near the landfill in both the SA and SGA/NGA. This is also consistent with the expected east-west divide occurring on the Des Moines upland dividing groundwater flow between Puget Sound and the Green River Valley.

The location of the groundwater divide within the SGA/NGA is known to occur near MW-14 and MW-23 along Interstate-5. However, the location of the groundwater divide within the SA remains to be delineated. Previous analysis by AGI showed the groundwater divide west of the landfill within the SA with all flow towards the hydraulic sink. However, the divide is not likely to occur this far to the west because natural springs from the SA drain the aquifer into McSorely Creek. This hydraulic feature places

the north-south groundwater divide within the SA likely between MW-20 and MW-7, or around the center of the landfill.

The updated groundwater analysis for the three aquifers was used to evaluate the suitability of potential additional sampling locations at either existing Midway Landfill monitoring wells or existing in-use/potentially in-use and operable water wells within the area surrounding the landfill. The evaluation is presented in Section 7.

7. EVALUATION OF EXISTING WELLS FOR USE AS POTENTIAL ADDITIONAL SAMPLING LOCATIONS

An objective identified in the last periodic review was to determine if any wells within a 1-mile radius of Midway Landfill are constructed in a manner that would allow for water quality sampling that would permit further characterization and delineation of the contaminant plume downgradient of the site. A second objective was to identify whether or not the ICs prohibiting water supply well drilling in "the affected area" are protective. To accomplish these objectives, Midway Landfill monitoring wells and water wells identified in the updated well inventory that could be used for collecting groundwater samples to monitor water quality surrounding the landfill are evaluated in this section, and wells in-use or potentially in-use for domestic purposes that are downgradient or cross-gradient of the landfill are identified.

7.1 Approach

The City plans to pursue an incremental approach to further investigating the extent of 1,4-dioxane in groundwater downgradient of the landfill. The SGA will be the focus of the investigation because the concentrations of 1,4-dioxane are greater within the SGA compared to the upgradient and overlying SA wells and UGA wells, consistent with the nature of 1,4-dioxane being a dense miscible fluid that migrates rapidly away from the source.

The planned approach will consist of a one-time initial sampling event for 1,4-dioxane at the following locations: 1) selected currently unused Midway Landfill monitoring wells completed in downgradient locations within the SA and SGA to further evaluate flow pathways and 2) available water well(s) completed in the SGA and located further downgradient of monitoring wells MW-20B, MW-29B and MW-30C where 1,4-dioxane exceeds regulatory criteria. If the results of the initial investigation show that 1,4-dioxane is present in further downgradient wells in the SGA, or if no wells are available for sampling, additional wells may be selected or installed.

In addition, owners of wells that are believed to be in-use or potentially in-use for domestic purposes that are downgradient or cross-gradient of the landfill will be contacted to determine if their well is being used, and the City will offer to sample their well.

7.2 Evaluation of Potential Additional Sampling Locations

Figure 14 displays the locations of additional available monitoring wells and potentially operable water wells in the UGA, SA, and SGA or downgradient discharge points (AA or DA) that are located downgradient of Midway Landfill within a 1-mile radius and could potentially be used for water quality monitoring. The figure indicates the aquifer of completion for each well and differentiates between wells that are not in-use, or in-use/potentially in-use. The suitability of the available wells for downgradient monitoring points were evaluated using the updated groundwater flow analysis for the UGA, SA, and SGA discussed in Section 6 above (Figures 11, 12, and 13). These figures show an updated understanding of groundwater flow surrounding the landfill. Detailed information for the landfill monitoring wells and surrounding water wells available for sampling that would provide further characterization are discussed below.

7.2.1 Midway Landfill Monitoring Wells

The existing Midway Landfill monitoring wells available for monitoring are shown on Figure 2 and summarized in Table 1. Well depths, screen completion details, and aquifer completion interpretation established by the RI are also presented in the table. Field verification by SPU shows that several of the historical wells are no longer accessible. Available monitoring wells located in the SA or SGA downgradient or cross-gradient of the landfill that are not currently being sampled include the following:

- MW-27C is completed in the NGA/SGA system northwest of the landfill. This well is in a more confined portion of the NGA/SGA, with a hydraulic head above 250 feet in elevation. The well is located near other potential solvent release sites and may provide useful information on the extent of 1,4-dioxane and other chlorinated solvents downgradient of those locations and confirm historical migration pathway interpretations.
- MW-30A and MW-30B are located downgradient of the landfill to the southeast. Both wells are reportedly completed in the SA, with the MW-30A completion anticipated to be more reflective of aquifer conditions. Monitoring of both wells for water quality, in addition to currently monitored well MW-30C, would provide information regarding both horizontal and vertical contamination migration pathways within the SA upgradient of potential discharge points within Midway Creek.
- MW-15B and MW-24A are completed in the SA south and southeast of the landfill in the area of the lower hydraulic head saddle where the SA discharges into the SGA. These wells would provide additional water quality data in that direction to help define the extent of the contamination plume and verify the interpretation of contaminant flow. Since well MW-15A is already part of the monitoring program, well MW-15B would provide information regarding horizontal and vertical contamination migration pathways within the SA upgradient of potential discharge points within Midway Creek.

It is recommended that a one-time sampling event be conducted at these monitoring wells to provide data to confirm the hydrogeologic flow conceptual model. Based on the results of the one-time sampling event, the utility of additional monitoring events will be determined.

7.2.2 Water Wells

Of the 12 operable or potentially operable water wells located within one mile of the Midway Landfill, most are not directly downgradient of the landfill based upon the regional flow analysis. The following water well downgradient of the Midway Landfill is believed to be potentially operable and completed in the SGA and is recommended as a potential location for initial evaluation.

- The Riefschnider Well (22Q1) is located immediately east and downgradient of MW-30 and is completed in the SGA. AGI (1990) stated that “The Riefschnider well is an old private water supply well reported in Luzier, 1968. It is apparently no longer in existence,” but “If this well existed, it would make an excellent downgradient monitoring point for the SGA.” Because research conducted during the updated well inventory found that a water right still exists, no decommissioning log has been filed, and the residence on the property appears to be unchanged, we recommend further assessment to confirm the availability of this well.

The following two wells are potentially in-use for domestic purposes and are located cross-gradient or downgradient of the landfill. The City will approach the owners of these wells to determine whether their wells are operational.

- The Eckland Well (22H1) is an in-use domestic well of unknown depth, from a land surface elevation of approximately 75 feet above sea level. The well is likely completed in the SGA and is northeast of Well 29 and in a cross-gradient location to the landfill. The well is located on the absolute margin of the Des Moines Upland, just south of Midway Creek, and would provide useful data regarding the discharge of the SGA to the AA.
- The Stearns Well (22A2) is a newly completed well drilled in 2016. The property was recently redeveloped with a residence in 2018. The well is completed in the shallow AA within the Kent Valley west of the Green River, which is near the natural discharge of the SGA to the AA.

7.3 Data Gaps and Uncertainties

The updated well inventory and groundwater flow analysis indicate there are some additional monitoring wells and private wells that could be sampled to further characterize groundwater downgradient of the landfill, although current use and operability of the water wells need to be confirmed. The Riefschnider well (22Q1) has been identified as a possible sampling location in the southeast of the landfill, but it is unknown whether this well is available. Another option could be the Kent Riverbend Well that located approximately 1 mile east of the landfill and completed in a lower zone of the AA. The NGA/SGA system likely discharges to upper portions of the AA in this area.

Two additional water wells (22Q1 and 22Q2) completed in the SA downgradient of the landfill could be considered for sampling in the event that SA monitoring wells MW-30A and/or MW-30B indicate elevated concentrations of 1,4-dioxane. As with the other private wells, the operability of these wells would need to be confirmed with the owners prior to any sampling event.

The updated well inventory and groundwater flow interpretation show there are no wells that are completed in the SGA west or southwest of MW-20B, although monitoring well MW-8B does monitor the SA in this direction. This is a likely downgradient direction based on the updated hydraulic analysis and groundwater saddle observed in the UGA, SA, and SGA/NGA. An alternative would be to determine the location of springs within McSorely Creek that are correlated to the source aquifer deposits, which are mapped as Qpogc (C Aquifer) in the lower stretches of the creek. However, sampling of the springs at the spring discharge may not provide a suitable location for sampling compared to withdrawing samples from a well.

Contributions from upgradient sources have not been defined and comingling of the 1,4-dioxane contaminant plumes is likely to have occurred. Although concentrations of 1,4-dioxane have been decreasing in SA upgradient wells MW-17B and MW-21B, concentrations of 1,1-DCE, PCE, and TCE have been increasing in well MW-21B. These upgradient sources add uncertainty to defining the plume extent derived from landfill contaminants. As noted above, further data regarding 1,4-dioxane from these neighboring and upgradient sites may become available in the future as Ecology begins to require testing for the emerging contaminant.

8. CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

8.1.1 Information for the Chemical 1,4-Dioxane

1,4-Dioxane is a synthetic industrial chemical and likely human carcinogen. It is often found at chlorinated solvent sites because it was used in the past as a stabilizer in certain solvents, paint strippers, greases, and waxes. 1,4-Dioxane is an emerging contaminant with limited background information on its extent in the environment and it has not been fully characterized at many historical cleanup sites.

The dense miscible properties of 1,4-dioxane lead to its rapid transport ahead of other contaminants. Due to its rapid transport, 1,4-dioxane may become depleted in high permeability aquifers but may be released over the longer term from secondary sources formed by its absorption into underlying low permeability layers.

Evaluating the occurrence of 1,4-dioxane in the environment is complicated by the fact that historically, detection limits were high using standard analytical methodology. Current methodology, EPA Method 522, using a solid-phase extraction with gas chromatography-mass spectrometry (GC/MS) and selected ion monitoring (SIM) can provide detection levels as low as 0.02 µg/L.

A federal or state Maximum Contaminant Level (MCL) has not been established for 1,4-dioxane. The Washington state water quality standard for groundwaters in the state of Washington (Chapter 173-200-040 WAC) for 1,4-dioxane is 7.0 µg/L. However, Ecology has established a MTCA Method B cleanup level of 0.4375 µg/L for 1,4-dioxane at cleanup sites such as the landfill. Compliance for the Midway Landfill is currently being evaluated using the more conservative MTCA Method B cleanup level of 0.4375 µg/L.

8.1.2 1,4-Dioxane in Groundwater in the Midway Landfill Vicinity

The information collected to date shows 1,4-dioxane concentrations are currently above the MTCA Method B cleanup level of 0.4375 µg/L in eight of the currently sampled 12 wells at the Midway Landfill (upgradient wells MW-17B and MW-21B, and downgradient wells MW-7B, MW-14B, MW-20B, MW-23B, MW-29B, and MW-30C), with the highest concentrations occurring in the SGA. The 1,4-dioxane concentrations at the Midway Landfill show decreasing trends, particularly in well MW-20B on the west side of the landfill where concentrations decreased from 53 µg/L in 2011 to less than 13 µg/L in 2019.

1,4-Dioxane is being tested at a limited number of sites in Washington, but some of the available historical data had detection limits higher than the cleanup criteria. 1,4-Dioxane has been detected at two other landfill sites within the state of Washington, with observed 1,4-dioxane concentrations of less than 100 µg/L that are in a comparable range of those at the Midway Landfill.

Current data indicates that no neighboring solvent release sites or Group A or Group B drinking water wells have been tested for 1,4-dioxane. The three Group A water systems closest to the landfill (the Kent Riverbend Well, King County Water District 54, and the Logandale Water Association) were not tested during the UCMR 3 data collection period. However, the two wells being used for drinking water (King County Water District 54 and Logandale) are not located downgradient of the landfill. All other Group A water systems in the area surrounding the landfill that were tested per EPA's UCRM 3 requirements in 2013-2015 had no detections of 1,4-dioxane (less than 0.07 µg/L), and DOH does not appear to require ongoing testing for 1,4-dioxane at wells where it was not detected.

8.1.3 Potential Other Sources of 1,4-Dioxane Near Midway Landfill

1,4-Dioxane is found as a stabilizer at dry cleaning facilities, in automotive degreasers at auto repair facilities, and as a by-product of plastic manufacturing. A number of sites upgradient of Midway Landfill were historically used for these functions, including a cluster of several documented chlorinated solvent release sites located immediately northwest of the Midway Landfill near the intersection of S 246th Street and Pacific Highway South. Seven of the sites have documented releases of chlorinated solvents (PCE, TCE, TCA, and vinyl chloride) into the environment, and chlorinated solvents have been detected in monitoring wells MW-17B and MW-21B upgradient of the Midway Landfill.

The presence of these confirmed and suspected solvent release sites complicates the determination of the nature and extent of releases of chlorinated solvents and 1,4-dioxane from the Midway Landfill. There may be undocumented comingling of contaminant plumes complicating analysis of compliance for the landfill with 1,4-dioxane and ROD contaminants. Further testing for 1,4-dioxane at these other release sites may be necessary to differentiate and identify 1,4-dioxane sources.

8.1.4 Updated Well Inventory

The updated well inventory shows that public water supply has increased in the area surrounding the Midway Landfill since the RI, but there are limited areas where properties remain disconnected from large public water supplies (e.g., Frager Road and east of Lake Fenwick Road). Active water use from private and domestic, Group B, or Group A wells is primarily east of the landfill

Table 7 displays details for the 12 wells that are in-use, potentially in-use, or not in-use but potentially operable within one mile of Midway Landfill. Of the eight wells in-use or potentially in-use, one is the Group A Kent Riverbend Well (22J2; in use for irrigation as discussed in Section 3.4.3), two are domestic wells used for drinking water (22A2 and 22H1), and five are domestic wells used for irrigation (21P1, 22Q1, 22Q2, 22Q3, and 29A2). Another four domestic wells (21C1, 21F1, 27A3, and 28G6) are potentially operable.

Two new wells were installed near the 1-mile radius of the landfill in 2016: a domestic water well (Stearns well 22A2) and a Group A irrigation well (Kent Riverbend Well 22J2).

Only five sites within one mile of Midway Landfill have resource protection wells completed deeper than 100 feet below ground. Therefore, most of these monitoring wells are completed within shallow perched aquifers (UGA) and likely would not be useful to characterize the contaminant migration extent downgradient of the landfill specifically in the SA or SGA. However, some wells could be useful to characterize the UGA upgradient of the landfill, especially surrounding confirmed or suspected solvent release sites.

8.1.5 Updated Groundwater Flow Analysis

Using the updated well inventory of wells within a 2-mile radius of the landfill, migration pathways for contaminants in groundwater in the UGA, SA, and SGA have been updated. The updated pathways are generally consistent with previous determinations presented in the RI. There is a lower hydraulic head saddle in all three aquifers near the southern end of the landfill where groundwater then migrates west and east across the upland groundwater divide towards either Puget Sound or the Green River Valley. However, the updated gradients show stronger westerly components of groundwater flow than previously considered.

8.2 Recommendations

Recommendations are provided for potential sampling of downgradient and cross-gradient locations, and for evaluating upgradient sources of 1,4-dioxane.

8.2.1 Additional Sampling of Downgradient and Cross-Gradient Locations

8.2.1.1 Approach

Substantial decreases have been observed in the concentrations of 1,4-dioxane observed in the Midway Landfill monitoring wells. In addition to continued monitoring of these trends in the current monitoring well network, the City plans to pursue an incremental approach to further investigate the extent of 1,4-dioxane in groundwater downgradient of the landfill. The planned approach will initially consist of a one-time initial sampling event for 1,4-dioxane at the following locations: 1) selected currently unused Midway Landfill monitoring wells completed in the SA and SGA to further evaluate flow pathways and 2) available water well(s) completed in the SGA and located further downgradient of monitoring wells MW-20B, MW-29B and MW-30C where 1,4-dioxane exceeds regulatory criteria. If the results of the initial investigation show that 1,4-dioxane is present in further downgradient wells in the SA or SGA, or if no wells are available for sampling, additional wells may be selected or installed if concentrations remain above regulatory criteria.

In addition, owners of domestic wells that are in-use or potentially in-use for domestic purposes within one mile of the Midway Landfill and are located in hydraulically downgradient or cross-gradient locations from the landfill will be contacted to determine if their well is being used, and the City will offer to sample their well.

8.2.1.2 Initial Investigation

Figure 14 displays the location of the currently sampled wells and additional sampling points that could be used to characterize groundwater quality surrounding the landfill in the SA and SGA and downgradient discharge points (AA or DA wells). The following unused wells within the existing Midway Landfill monitoring well network will be sampled during the initial event:

- MW-27C is completed in the NGA/SGA system northwest of the landfill. The well is located near other potential solvent release sites and may provide useful information on the extent of 1,4 - dioxane and other chlorinated solvents downgradient of those locations and confirm historical migration pathway interpretations.
- MW-30A and MW-30B are located downgradient of the landfill to the southeast. Both wells are reportedly completed in the SA, with the MW-30A completion anticipated to be more reflective of aquifer conditions. Monitoring of both wells for water quality, in addition to currently monitored well MW-30C, would provide information regarding both horizontal and vertical contamination migration pathways within the SA upgradient of potential discharge points within Midway Creek.
- MW-15B and MW-24A are completed in the SA south and southeast of the landfill in the area of the lower hydraulic head saddle where the SA discharges into the SGA. These wells would provide additional water quality data in that direction to help define the extent of the contamination plume and verify the interpretation of contaminant flow. Since well MW-15A is already part of the monitoring program, well MW-15B would provide information regarding horizontal and vertical contamination migration pathways within the SA upgradient of potential discharge points within Midway Creek.

Of the 12 operable or potentially operable water wells located within one mile of the Midway Landfill, there are only four that are downgradient of the landfill, one in the AA (22J2), one in the SGA (22Q1) and two in the SA (22Q2 and 22Q3). Initially, the City proposes to sample the closest downgradient well completed in the SGA that is believed to be potentially operable.

- The Riefschnider Well (22Q1) is located east and downgradient of MW-30 and is completed in the SGA. We recommend further assessment to confirm the availability of this well.

Two domestic wells are in-use or potentially in-use for domestic purposes within one mile of the Midway Landfill and these two wells are in hydraulically cross-gradient or downgradient positions with respect to the landfill.

- The Eckland Well (22H1) is an in-use domestic well of unknown depth, from a land surface elevation of approximately 75 feet above sea level. The well is likely completed in the SGA and is northeast of Well 29B.
- The Stearns Well (22A2) is a newly completed well drilled in 2016. The property was recently redeveloped with a residence in 2018. The well is completed in the shallow AA within the Kent Valley west of the Green River, which is near the natural discharge of the SGA to the AA.

The City will approach the owners of these wells to determine whether their wells are operational. An advisory letter discussing the various aspects of this report will be drafted to provide to owners of potential in-use and/or operable wells to prepare for potential sampling. The intent of the letter will be informational and will also request that the owner provide further information regarding their well. If the wells are determined to be in use for drinking water, the City will offer to sample the wells.

8.2.1.3 Possible Future Investigations

The Riefschnider well (22Q1) has been identified as a possible sampling location in the southeast of the landfill, but it is unknown whether this well is available. Another option could be the Kent Riverbend Well that located approximately 1 mile east of the landfill and completed in a lower zone of the AA. The NGA/SGA system likely discharges to upper portions of the AA in this area.

Two additional water wells (22Q1 and 22Q2) completed in the SA in downgradient locations could be considered for sampling in the event that SA monitoring wells MW-30A and/or MW-30B indicate elevated concentrations of 1,4-dioxane, although current use and operability of the water wells need to be confirmed.

The updated well inventory and groundwater flow interpretation show there are no wells completed in the SGA west or southwest of MW-20B, although monitoring well MW-8B does monitor the SA in this direction. This is a likely downgradient direction based on the updated hydraulic analysis and groundwater saddle observed in the UGA, SA, and SGA/NGA. An alternative would be to determine the location of springs within McSorely Creek that are correlated to the source aquifer deposits, which are mapped as Qpogc (C Aquifer) in the lower stretches of the creek. However, sampling of the springs at the spring source site may not provide a suitable location for sampling compared to withdrawing samples from a well.

8.2.2 Evaluation of Upgradient Sources

Currently, only three UGA Midway Landfill monitoring wells are routinely tested for 1,4-dioxane. The 2012 additional testing at five additional monitoring wells in the UGA attempted to delineate upgradient sources such as the sites listed above, as described in Section 3.1, but the extent of 1,4-dioxane was not delineated. Further testing for 1,4-dioxane at these other release sites may be necessary to differentiate

and identify 1,4-dioxane sources. For sites enrolled in Ecology's VCP, it may be necessary for Ecology to require analysis of 1,4-dioxane to confirm they are not contributing or comingling with the Midway Landfill groundwater contamination plume.

9. LIMITATIONS

One of the main limitations of updating the water well inventory is historical homes that have domestic wells that are being used for irrigation purposes only, or wells that have been simply covered and remain in place. The verification process to determine if these wells are being used, or if they are still present and accessible, often requires direct communication with the property owner, and this is the reason for Ecology's involvement in the recommendations of the five-year review (EPA 2015). We used information from the previous water supply inventory (Parametrix 1988b), the King County Assessor (King County Assessor 2019), Ecology (Ecology 2019a, 2019b), DOH (DOH 2019), City of Kent Public Works (Reige 2018), and Google® (Google® 2019) to determine active or potentially active status of wells surrounding the landfill. Interpretation of these data sources in relation to property redevelopment was required to determine active or potentially active status. Additionally, some interpretation was based on data from approximately 28 years ago from the previous well inventory, the reliability of Ecology and DOH databases, and lack of well decommissioning logs for older wells. The geologic and hydrogeologic interpretations presented in this report are limited to the data sources and available information sources. The data are subject to future revision and understanding to evaluate overall impact of water quality surrounding the Midway Landfill.

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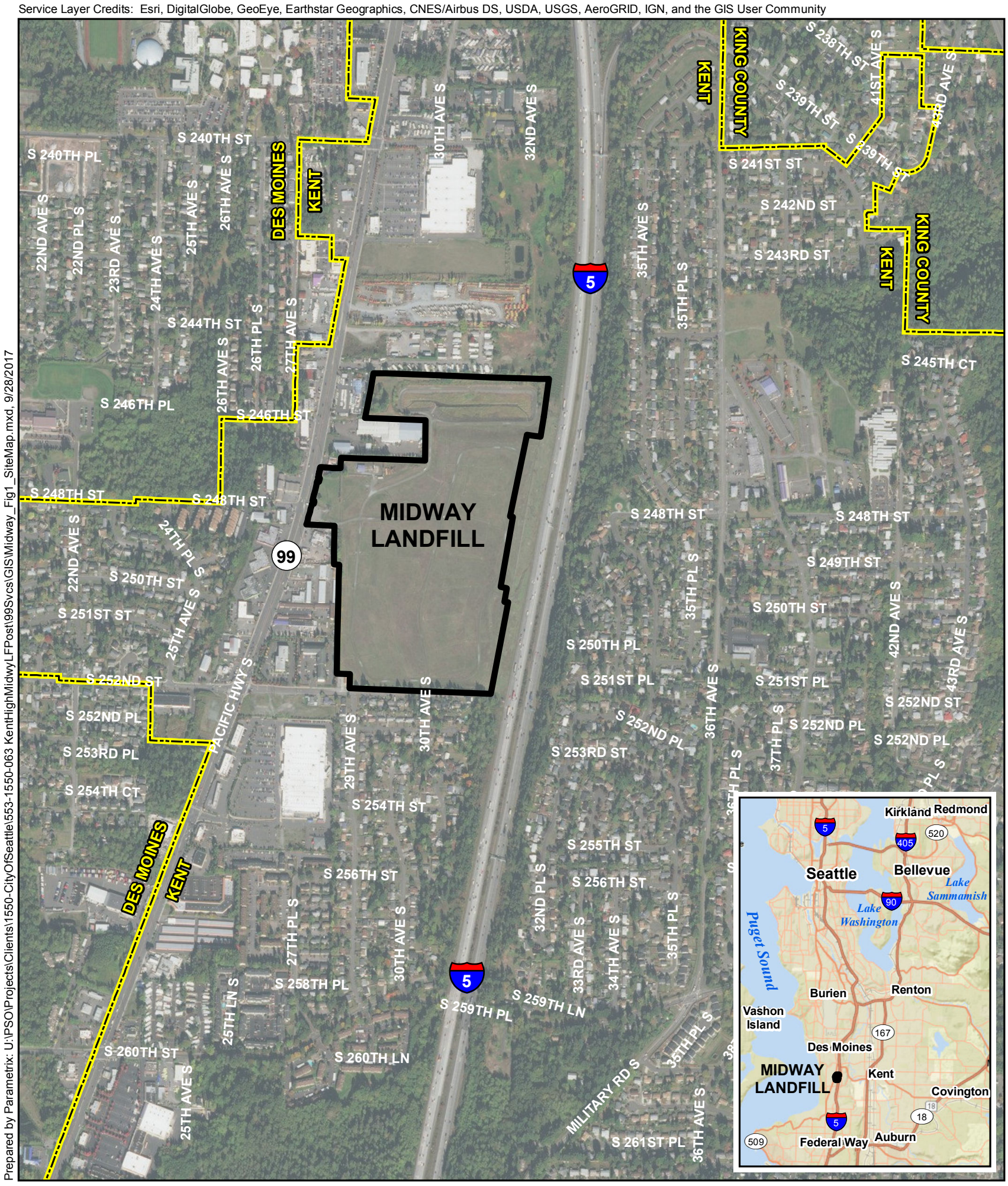
Figures

Service Layer Credits: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



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Feet

Parametrix
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City of Seattle, Seattle Public Utilities Owned Parcel Boundary That Includes Kent Highlands Landfill

Figure 1
Site Location Map
Midway Landfill
Kent, Washington

LEGEND

MW-XX — INACTIVE MIDWAY MONITORING WELL LOCATION / ID

MW-XX — ACTIVE MIDWAY MONITORING WELL/ID (COLOR DENOTES AQUIFER)

LANDFILL AQUIFER WELL ID

UPPER GRAVEL AQUIFER WELL ID

SAND AQUIFER WELL ID

NORTHERN/SOUTHERN GRAVEL AQUIFER WELL ID

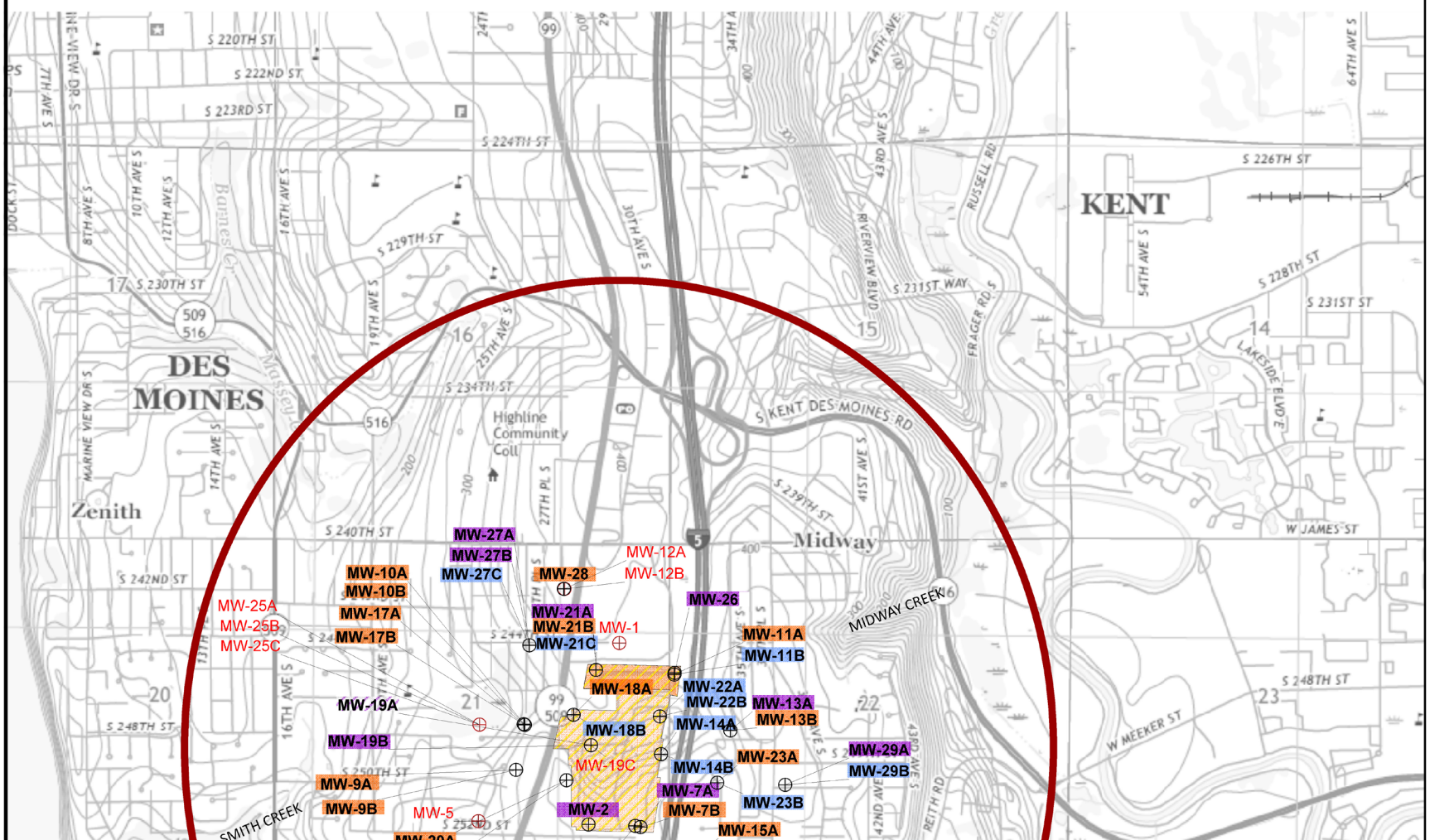
MIDWAY LANDFILL PARCELS WITH REFUSE

MIDWAY LANDFILL PARCELS WITH NO REFUSE

N

0' 2,000'

SCALE



Landfill Aquifer Monitoring Wells

Well ID	Meas Pt El. (ft)	Screen El. (ft)
MW-19A	370.2	295.9 - 285.9

Upper Gravel Aquifer Monitoring Wells

Well ID	Meas Pt El. (ft)	Screen El. (ft)
MW-2	384.39	256.0 - 226.0
MW-3	416.11	260.0 - 228.1
MW-4	362.82	252.8 - 219.1
MW-7A	412.73	225.0 - 215.5
MW-8A	351.35	183.3 - 172.8
MW-13A	382.68	274.2 - 271.3
MW-16	362.8	201.7 - 196.3
MW-19B	370.2	200.2 - 195.2
MW-21A	359.95	273.1 - 263.1
MW-26	370.58	257.4 - 252.4
MW-27A	330.05	253.5 - 243.1
MW-27B	330.05	182.8 - 177.4
MW-29A	428.5	220.8 - 210.8

Sand Aquifer Monitoring Wells

Well ID	Meas Pt El. (ft)	Screen El. (ft)
MW-7B	412.73	190.6 - 187.6
MW-8B	351.35	150.9 - 145.5
MW-9A	353.79	226.9 - 216.5
MW-9B	353.79	189.8 - 184.4
MW-10A	338.77	146.7 - 137.0
MW-10B	338.77	116.3 - 107.3
MW-11A	370.41	169.4 - 159.4
MW-13B	382.68	186.9 - 176.4
MW-15B	438.54	178.7 - 173.2
MW-17A	337.08	249.6 - 239.2
MW-17B	337.08	211.4 - 204.4
MW-18A	343.91	223.6 - 213.1
MW-20A	375.65	183.7 - 178.7
MW-21B	359.95	188.1 - 178.1
MW-23A	424.42	195.0 - 185.0
MW-24A	418.58	213.6 - 203.6
MW-28	374.15	267.2 - 262.2
MW-30A	407.91	224.6 - 214.6
MW-30B	407.91	133.4 - 123.4

Northern and Southern Gravel Aquifer Wells

Well ID	Meas Pt El. (ft)	Screen El. (ft)
MW-11B	370.41	103.9 - 98.5
MW-14A	381.85	103.4 - 98.0
MW-14B	381.85	79.0- 73.5
MW-18B	343.91	61.3 - 50.9
MW-20B	375.65	78.7 - 73.7
MW-21C	359.95	68.0 - 63.0
MW-22A	378.28	108.0 - 103.8
MW-22B	378.28	76.6 - 66.6
MW-23B	424.42	104.7 - 94.7
MW-24B	418.58	68.6 - 63.6
MW-27C	330.05	70.4 - 65.4
MW-29B	428.5	58.9 - 51.9
MW-30C	407.91	61.8 - 56.8

MAP SOURCE: USGS DES MOINES AND POVERTY BAY 7.5-MIN QUADRANGLES

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SEATTLE PUBLIC UTILITIES
MIDWAY LANDFILL
1,4-DIOXANE EVALUATION

PM: K EASTHOUSE
PROJ.#10887
DRAWN BY: M BRADY
ISSUE DATE: 07/23/19
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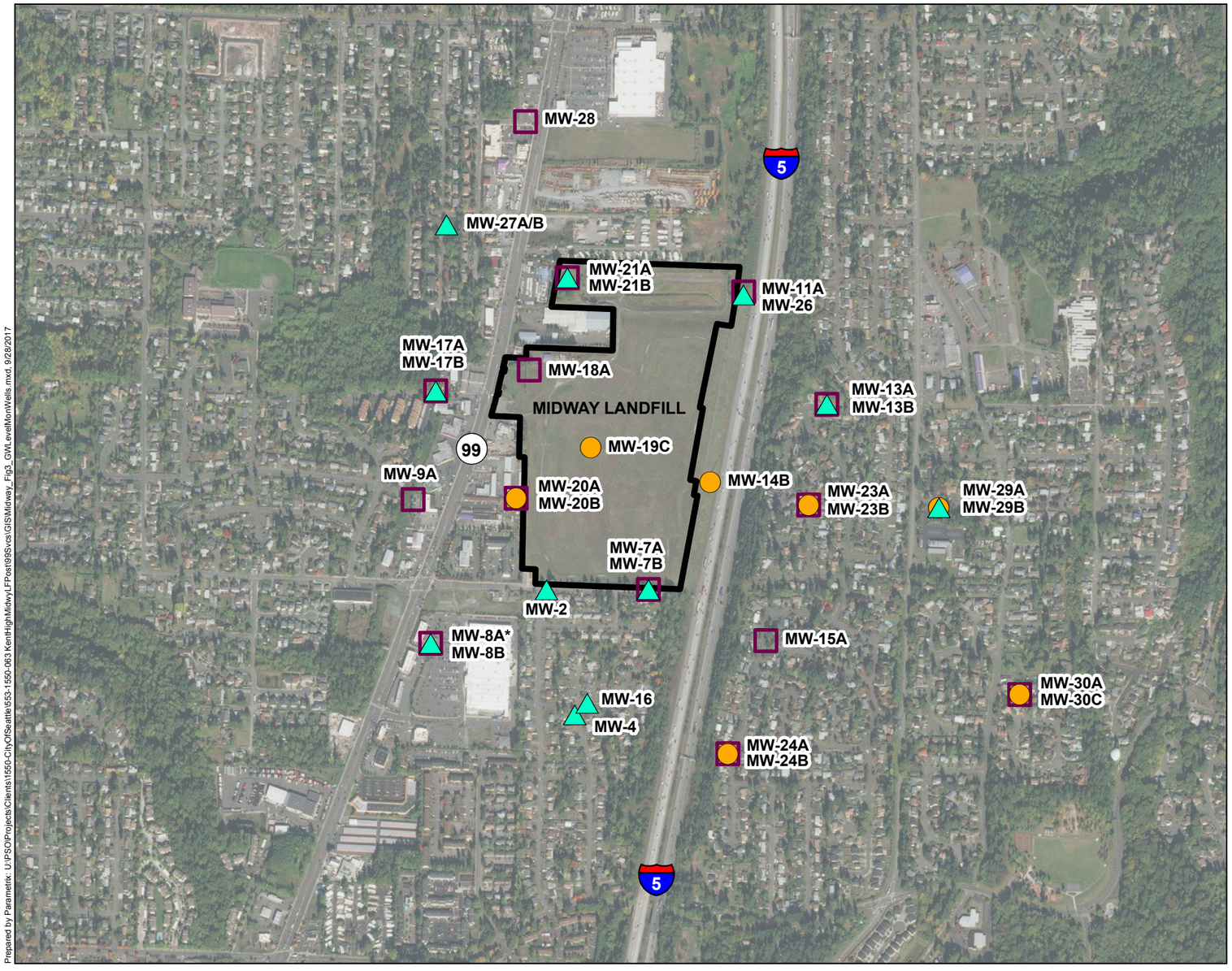
Figure 2
Monitoring Well Location Map
Midway Landfill
Kent, Washington



- Upper Gravel Aquifer Monitoring Well
- Sand Aquifer Monitoring Well
- Southern Gravel Aquifer Monitoring Well

* MW-8A is screened at the contact between the UGA and SA. Fluid levels in this well are considered representative of the UGA and the SA.

N

0 350 700 1,050

Feet

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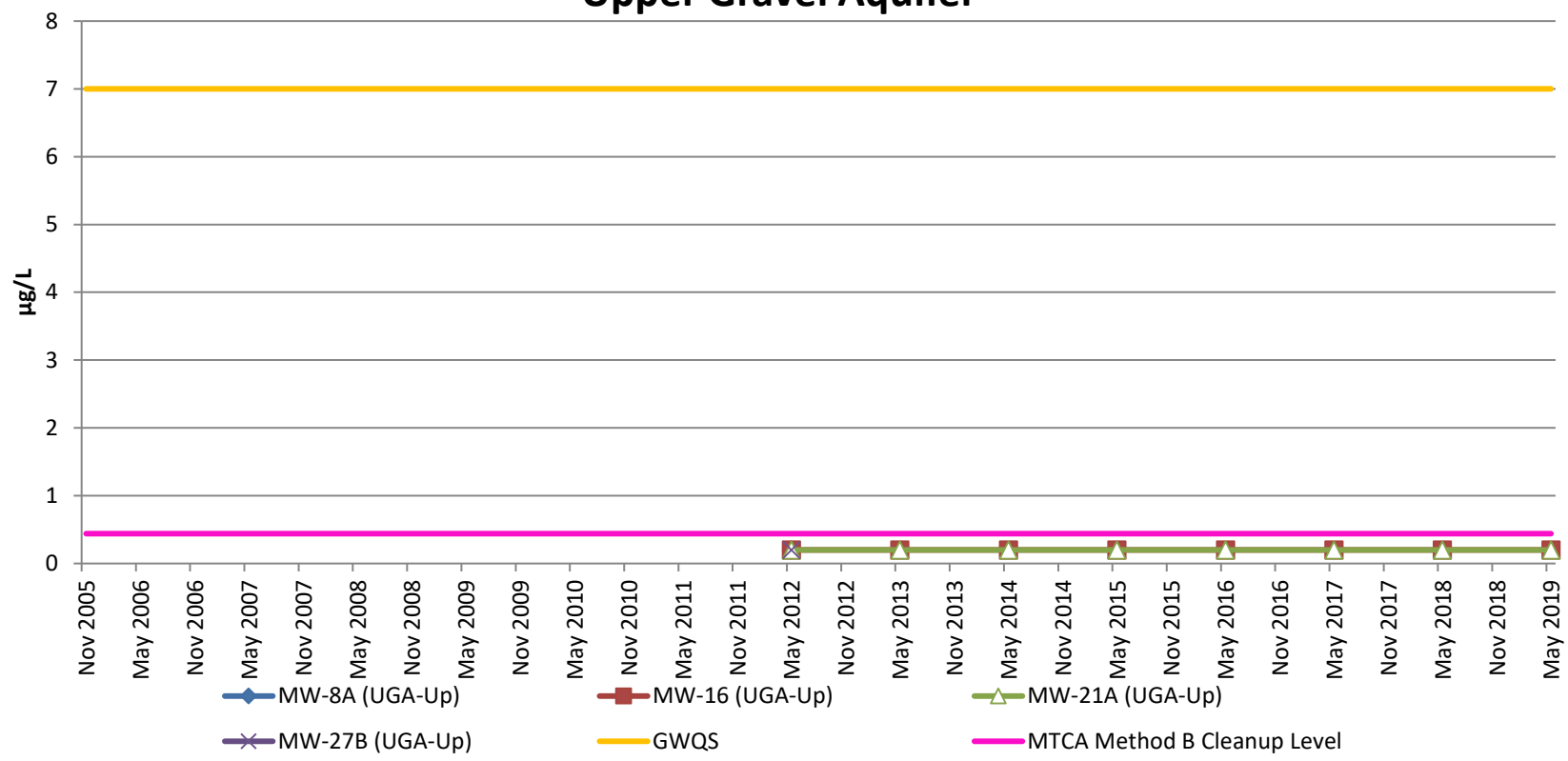
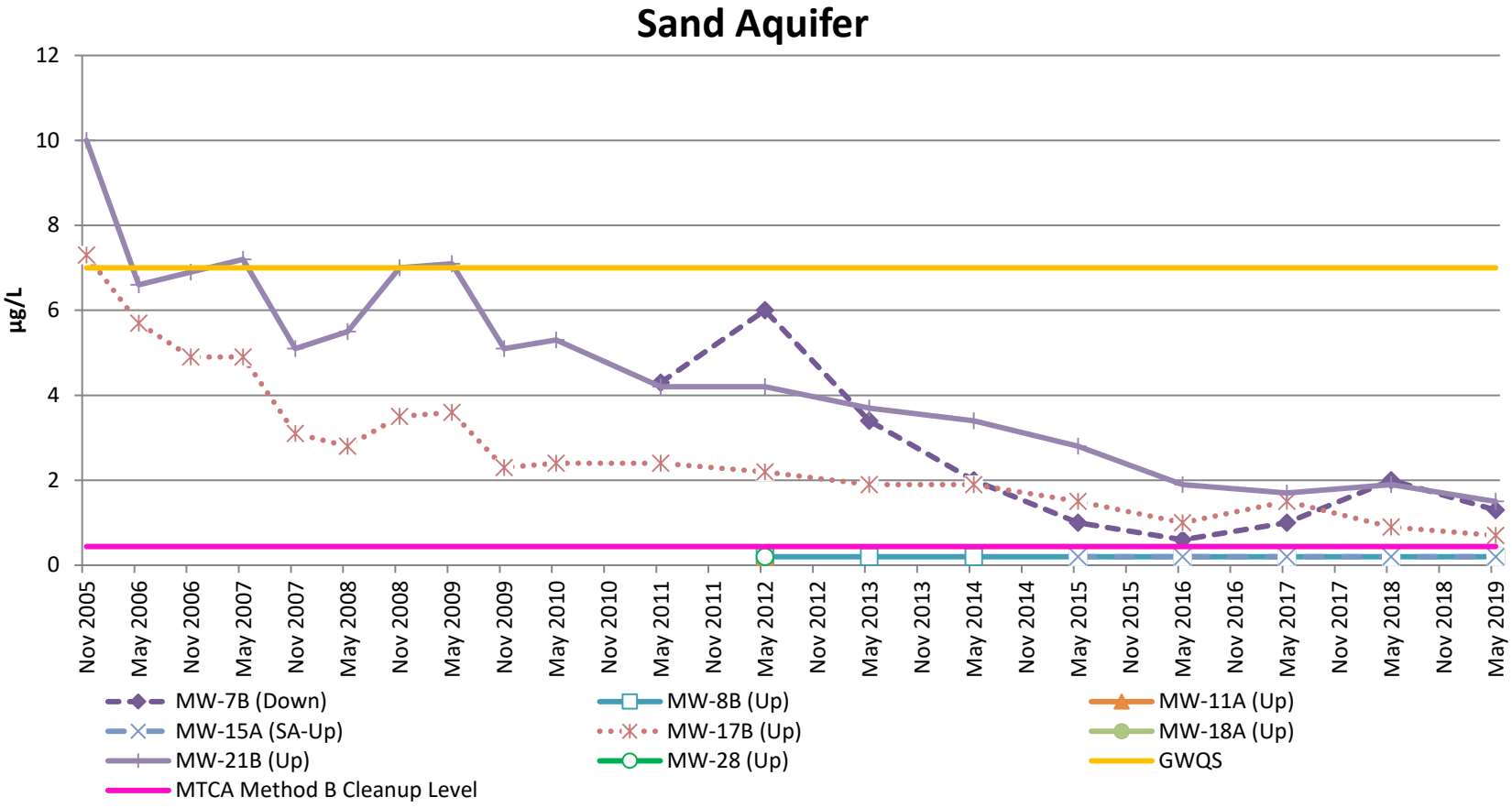
City of Seattle, Seattle Public Utilities Owned Parcel Boundary That Includes Kent Highlands Landfill

Figure 3
Upper Gravel Aquifer, Sand Aquifer and Southern Gravel Aquifer Groundwater Level Monitoring Network
Midway Landfill
Kent, Washington

Upper Gravel Aquifer



Sand Aquifer



Southern Gravel Aquifer

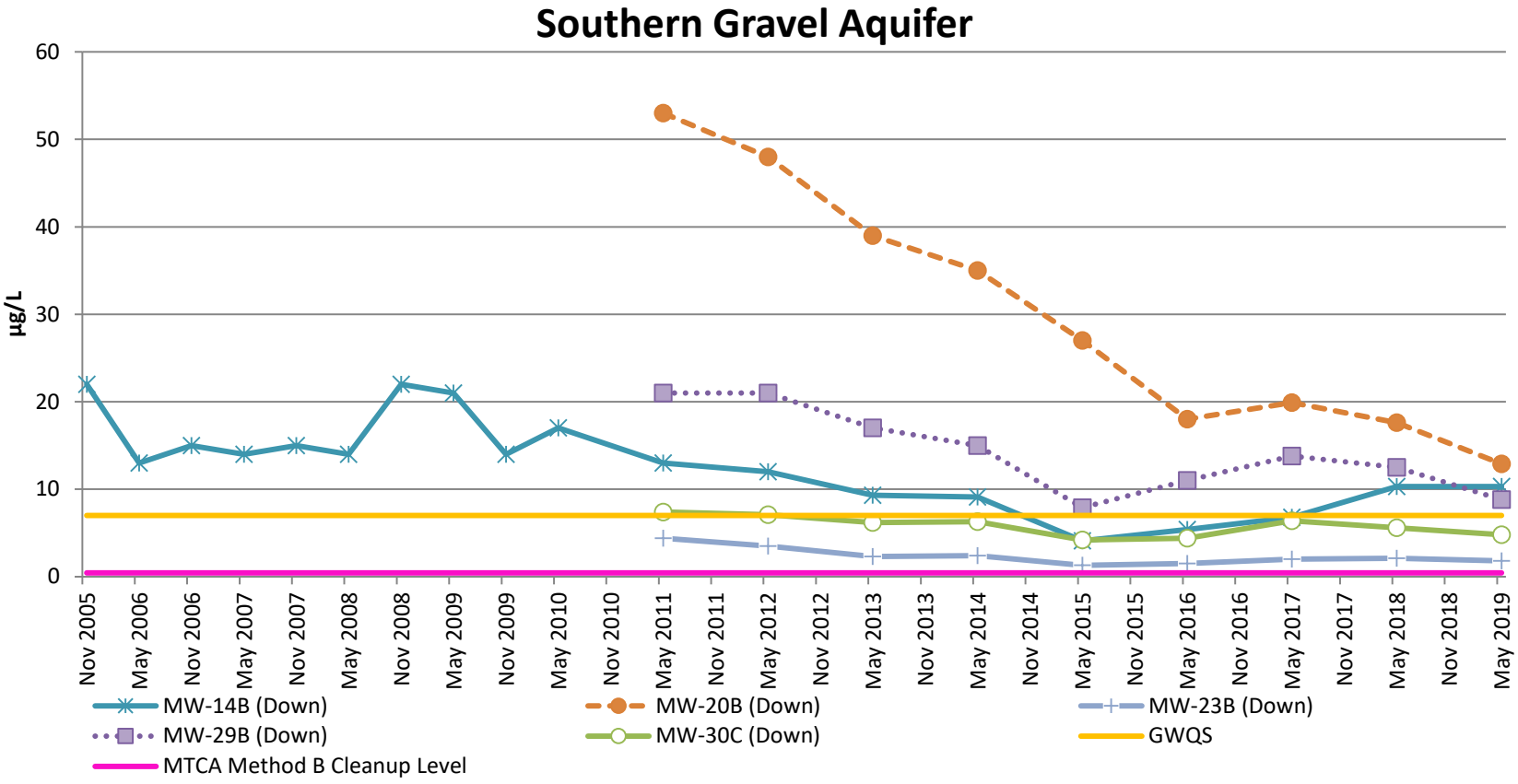


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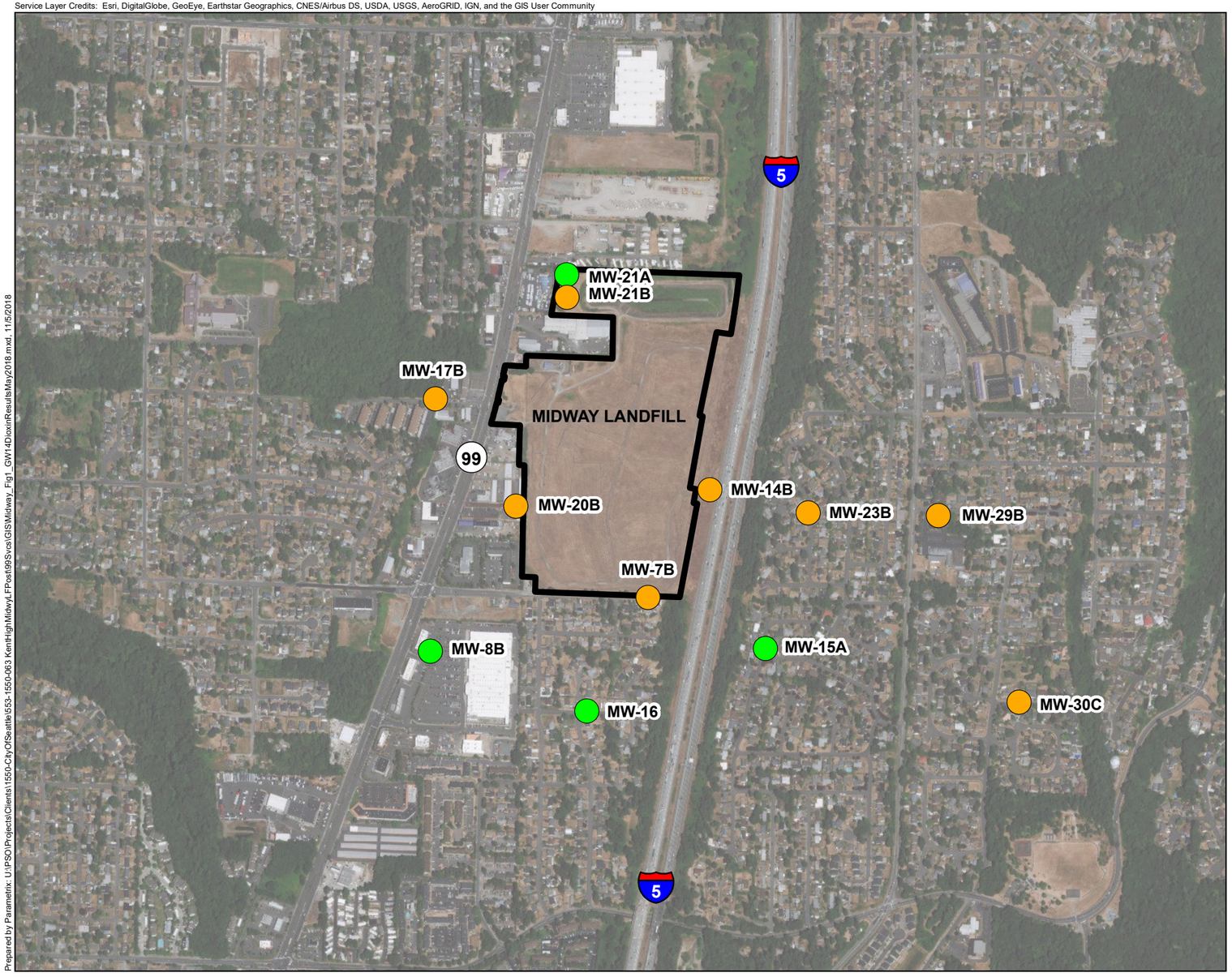
Figure 4
1,4-Dioxane Results by Aquifer
Midway Landfill
Kent, Washington

Service Layer Credits: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



1,4-Dioxane

- Exceeds CUL (0.44 ug/L)
- Does Not Exceed CUL

N

0 350 700 1,050

Feet

Prepared by Parametrix: U:\PSO\Projects\Clients\1550-CityOfSeattle\553-1550-063 KentHighMidwayLFPost99Svcs\GIS\Midway_Fig1_GW14DioxinResultsMay2018.mxd, 11/5/2018

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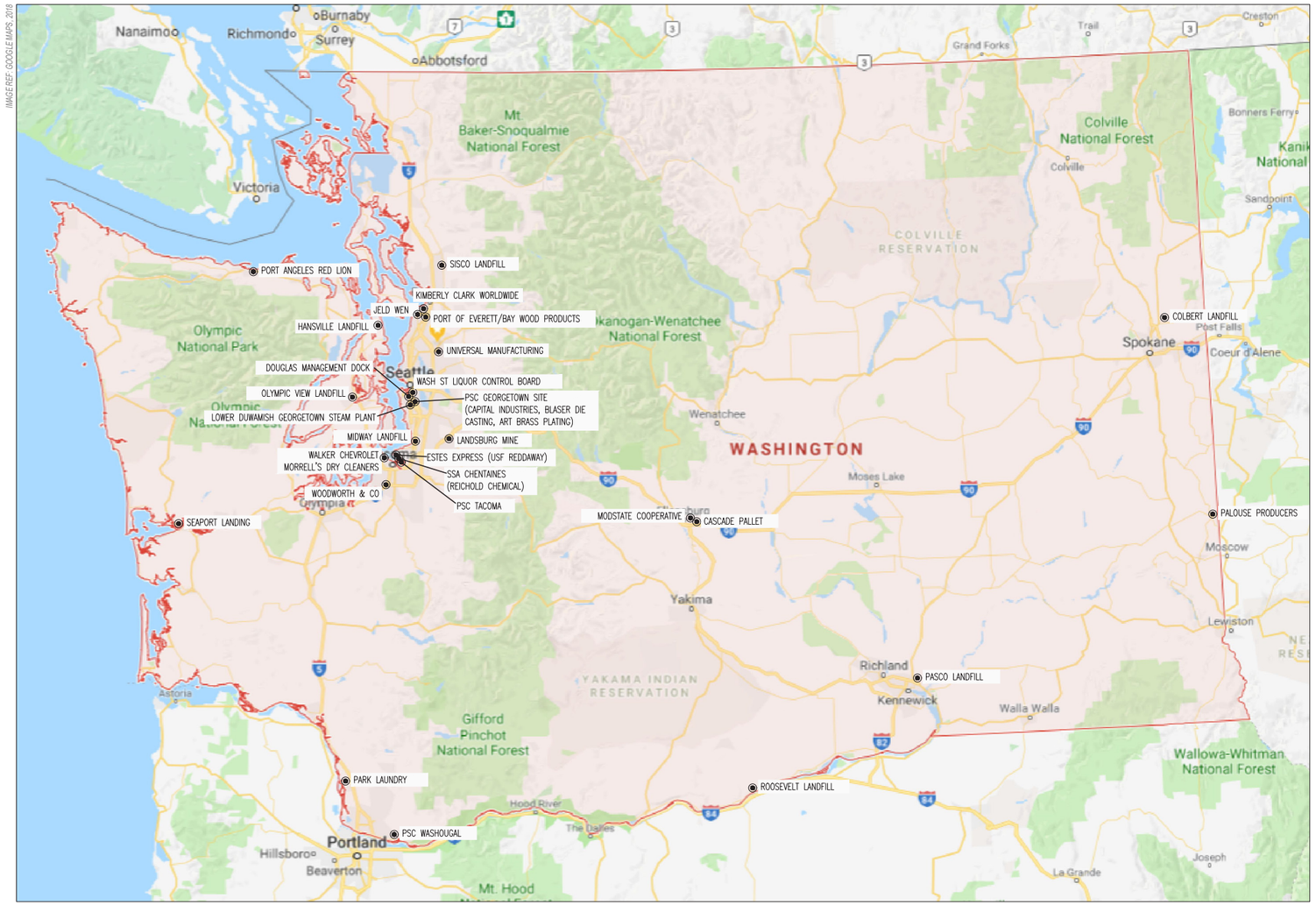
City of Seattle, Seattle Public Utilities Owned Parcel Boundary That Includes Kent Highlands Landfill

Figure 5
Comparison of 1,4-Dioxane to MTCA B Cleanup Level, Round 65 (May 2018)
Midway Landfill
Kent, Washington



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MIDWAY LANDFILL
1,4 DIOXANE EVALUATION

SEATTLE PUBLIC UTILITIES
(IN ASSOCIATION WITH PARAMETRIX)
SEATTLE, WA

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INSPECTORS:
SURVEY DATE:
EHSI PROJECT #: 10887-4.4
DRAWN BY: F DIMALANTA
SCALE: SHOWN
ISSUE DATE: 06/28/19

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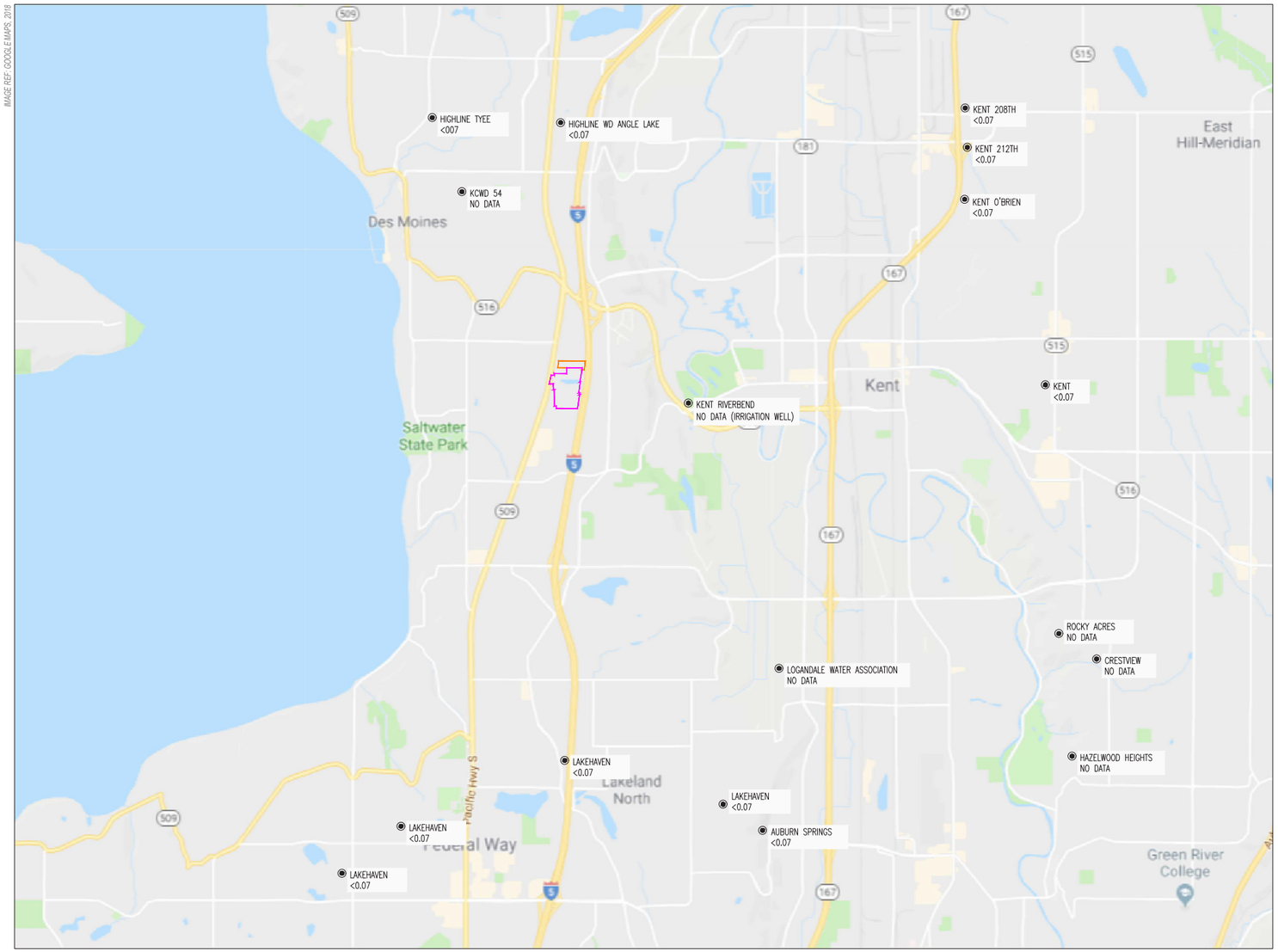
Figure 6
Washington Sites with Historical Testing of 1,4-Dioxane Submitted to Ecology's EIM Database
Midway Landfill
Kent, Washington



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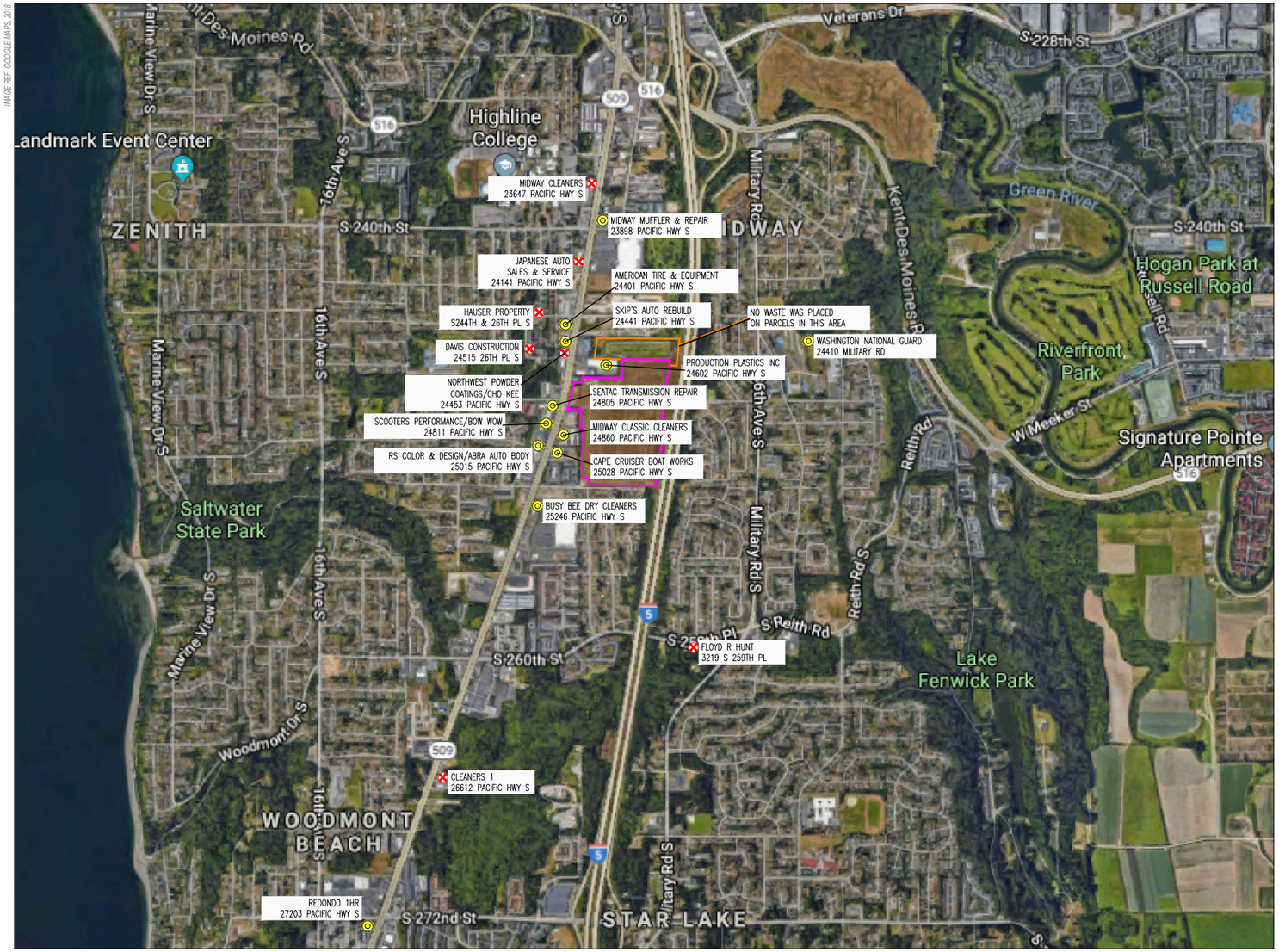
ISSUE DATE: 06/28/19

Figure 7
Group A Water Supply Wells Surrounding the Midway Landfill and 1,4-Dioxane Testing
Midway Landfill
Kent, Washington



NORTH

FOR ILLUSTRATIVE PURPOSES ONLY.

0 500' 1,000' 2,000'
SCALE

KEY

ABC CONFIRMED SOLVENT RELEASE SITES

ABC SUSPECTED SOLVENT RELEASE SITES

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MIDWAY LANDFILL
1,4 DIOXANE EVALUATION

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SEATTLE, WA

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Figure 8
Confirmed or Suspected Solvent Use/Release Sites Surrounding the Midway Landfill
Midway Landfill
Kent, Washington

LEGEND

MW-XX — MIDWAY MONITORING WELL LOCATION / ID

NOT IN USE WATER WELL LOCATION

NOT IN USE, OPERABLE WATER WELL LOCATION

IN USE/ POTENTIALLY IN USE WATER WELL LOCATION

ALLUVIAL AQUIFER WELL ID

UPPER GRAVEL AQUIFER WELL ID

SAND AQUIFER WELL ID

NORTHERN/SOUTHERN GRAVEL AQUIFER WELL ID

DEEP AQUIFER WELL ID

MIDWAY LANDFILL PARCELS WITH REFUSE

MIDWAY LANDFILL PARCELS WITH NO REFUSE

N

0' 2,000'

SCALE

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Section Key (USGS Standard Labels)

Frager Rd / Reith Rd Area

APPROXIMATE ONE-MILE RADIUS

Lake Fenwick Area

Midway Upland

Midway Upland

Kent Valley

MAP ID	Owner	MAP ID	Owner
16L1	Erickson	22Q1	Riefschnider
16N1	Highline WD Well 5	22Q2	Kraft
16R1	Roland	22Q3	Book
21B1	Shuck	27A3	Huddleston
21B2	Johnson	27D1	Moore
21C1	Stoner	27E1	Brannan
21C2	Sahee	27G1	Dehnert
21C3	Bjelland	27M1	Kent Cambridge
21F1	Marcus Whitman Church	28A1	Guitar
21G1	Maynard	28B1	Sides
21K1	Grohs	28D1	Molitar
21M1	Wilson	28E1	Jacobs
21N1	Muller (Sasta)	28G1	Beattie
21N2	Smith	28G3	Highline WD Well 8
21P1	Strange	28G4	Highline WD
22A1	Unknown	28G5	Highline WD Well 8M
22A2	Stearns	28G6	Rost
22B1	Pierce	28L1	Brown 1
22E1	Kent Test well	28L2	Brown 2
22H1	Eckland	28L3	Howard
22J1	Kent Riverbend 1	29A1	Larson
22J2	Kent Riverbend 1R	29A2	Meeker

MAP SOURCE: USGS DES MOINES AND POVERTY BAY 7.5-MIN QUADRANGLES

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1,4-DIOXANE EVALUATION

PM: K EASTHOUSE
PROJ.#:10887
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ISSUE DATE: 07/23/19
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Figure 9
1-Mile Radius Water Well Location Map
Midway Landfill
Kent, Washington

LEGEND

XXXX RESOURCE PROTECTION WELL LOCATION / ID

MIDWAY LANDFILL PARCELS WITH REFUSE

MIDWAY LANDFILL PARCELS WITH NO REFUSE

N

0' 2,000'

SCALE

Kent Highlands NPL (multiple wells)
15G,H, J, K, L,M, N, P, Q

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Section Key (USGS Standard Labels)

APPROXIMATE ONE-MILE RADIUS

MAP ID	OWNER	MAP ID	OWNER	MAP ID	OWNER
R14N1	PACIFIC PROPELLER	R21B1	Argus	R22E2	FM GAS STATION
R15N1	Kent West LLC	R21B2	BP ARCO 4484	R22R1	Benjamin Ryan
R15N2	Mathews	R21B3	City Pacific Land Company	R27C1	KENT FEILD
R15N3	WSDOT	R21B4	GINSBERG	R27K1	STORM DRAIN IMPROVEMENTS
R16R1	City Of Kent	R21G1	CHOC SOO CHUL	R28A1	City Of Kent
R16R2	Park	R21G2	VACANT LOT	R28A2	Gabrielle Dayrit - Pembrooke
R16R1	FARALLON	R21D1	PSE	R28A3	ORILLIA ROAD CROSSING
R16R2	MIDWAY CLEANERS	R21F2	HIGHLAND SD	R28A4	PIERCE CO. LINE TO TUKWILA
R16R3	Louis Gadini	R21E1	PARKSIDE ELEMENTARY	R28A5	S 260TH CROSSING
R16R4	Michael Park	R21J1	Cadence Capital	R28A6	WSDOT
R16R5	SHANNON AND WILSON	R21K1	EARTH CONSULTANTS	R28C1	Kim
R16R6	UNOCAL (#6211)	R21M2	Scott Hensrude	R28C2	CLEANERS 1 CO
R16Q1	Highline College	R21Q1	FRED MEYER	R28C3	Midway Chevron
R16Q2	ENSR	R21Q2	U-HAUL	R28C4	SHELL
R21A1	ARCO | ARCADIS	R21Q3	Wendys Restaurant	R28C5	Southland Corp | Stantec
R21A2	B & B AIRCRAFT	R21M1	City of Des Moines	R28C6	TIM JORVE
R21A3	Centrum Financial Services	R22A1	Green Riv - Former Nursery	R28D1	Stantec Facility 18758
R21A4	CITY OF KENT	R21F1	AUTO BODY SHOP	R28F1	OHS MARKET
R21A5	KENT DRIVE IN	R22F2	Federal Way School Dist	R28J1	WSDOT
R21A6	Sea Mar	R22F3	Jaswal Harpreet DR	R28K1	Health Point
R21A7	WIDING CONSTRUCTION	R22E1	ERI	R15XX	Kent Highlands NPL Site (SPU)

MAP SOURCE: USGS DES MOINES AND POVERTY BAY 7.5-MIN QUADRANGLES

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Figure 10
1-Mile Radius Resource Protection Well Location Map
Midway Landfill
Kent, Washington

LEGEND

MW-XX ⊗ UGA MIDWAY MONITORING WELL ID

XXXX ⊕ UGA WATER WELL ID

XXXX ⊕ UGA WELL LOCATION / WATER LEVEL ELEVATION

XXX GROUNDWATER CONTOUR (POTENTIOMETRIC SURFACE)

WETLANDS (UGA AT LAND SURFACE)

SURFACE FLOW DIRECTION

GROUNDWATER FLOW DIRECTION

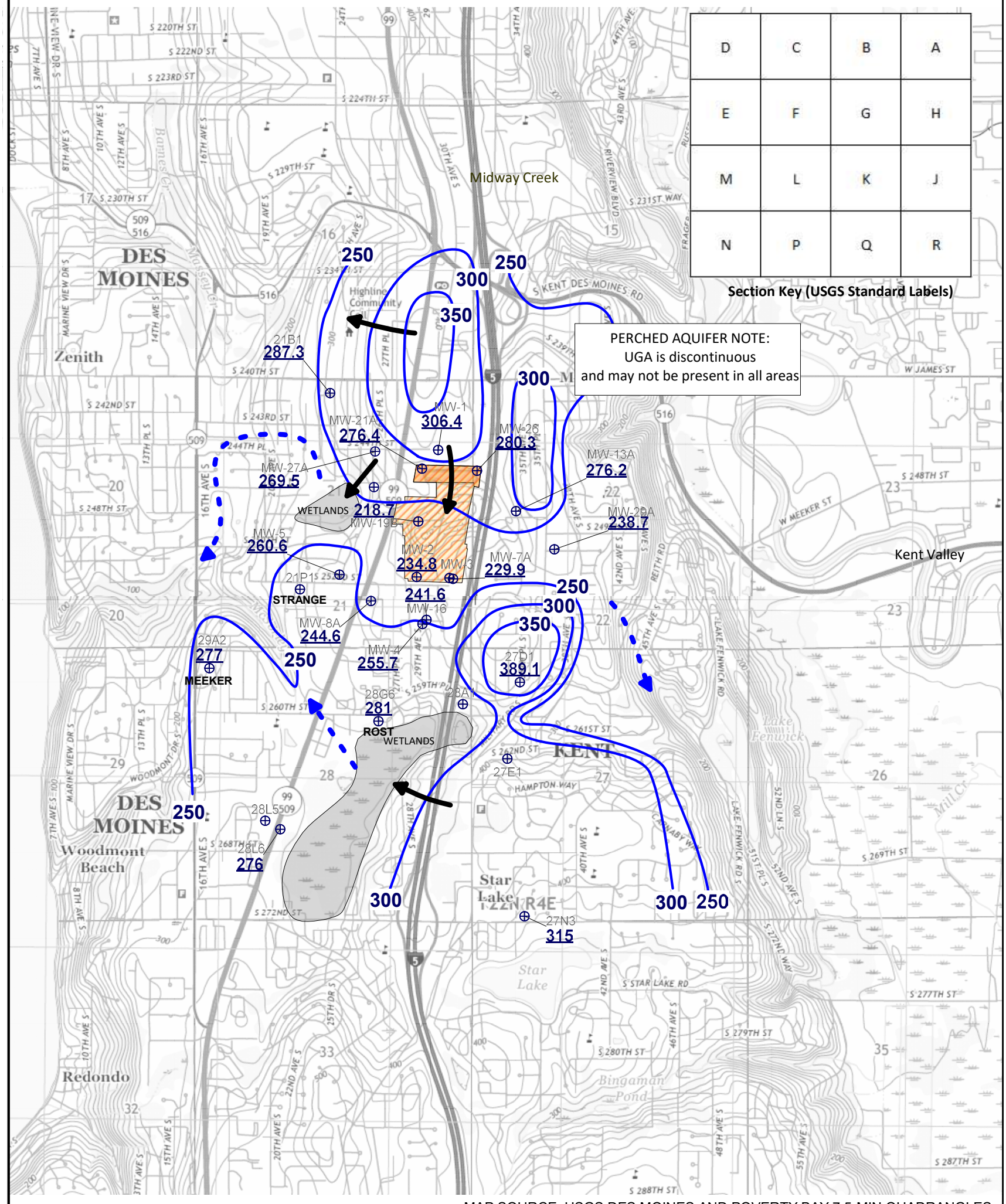
MIDWAY LANDFILL PARCELS WITH REFUSE

MIDWAY LANDFILL PARCELS WITH NO REFUSE

N

0' 2,000'

SCALE



D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Section Key (USGS Standard Labels)

MAP SOURCE: USGS DES MOINES AND POVERTY BAY 7.5-MIN QUADRANGLES

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Figure 11
Upper Gravel Aquifer
Potentiometric Surface Map
Midway Landfill
Kent, Washington

LEGEND

MW-XX SA MIDWAY MONITORING WELL ID

XXXX SA WATER WELL ID

XXXX SA WELL LOCATION / WATER LEVEL ELEVATION

XXX GROUNDWATER CONTOUR (POTENTIOMETRIC SURFACE)

SURFACE FLOW DIRECTION

GROUNDWATER FLOW DIRECTION

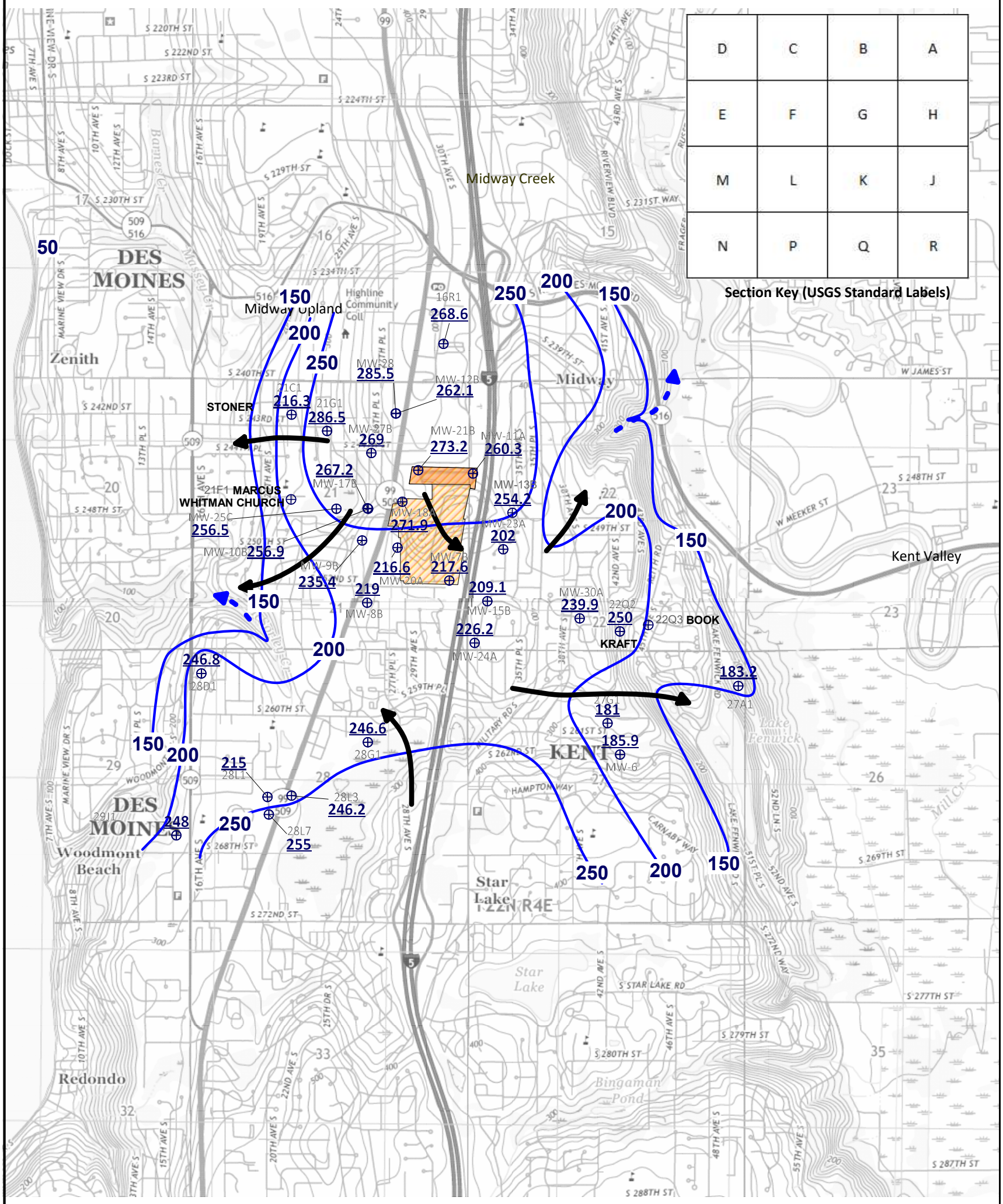
MIDWAY LANDFILL PARCELS WITH REFUSE

MIDWAY LANDFILL PARCELS WITH NO REFUSE

N

0' 2,000'

SCALE



MAP SOURCE: USGS DES MOINES AND POVERTY BAY 7.5-MIN QUADRANGLES

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Figure 12
Sand Aquifer
Potentiometric Surface Map
Midway Landfill
Kent, Washington

LEGEND

MW-XX — NGA/ SGA MIDWAY MONITORING WELL ID

XXXX — NGA/SGA WATER WELL ID

XXXX — NGA/SGA WELL LOCATION / WATER LEVEL ELEVATION

XXX — GROUNDWATER CONTOUR (POTENTIOMETRIC SURFACE)

SURFACE FLOW DIRECTION

GROUNDWATER FLOW DIRECTION

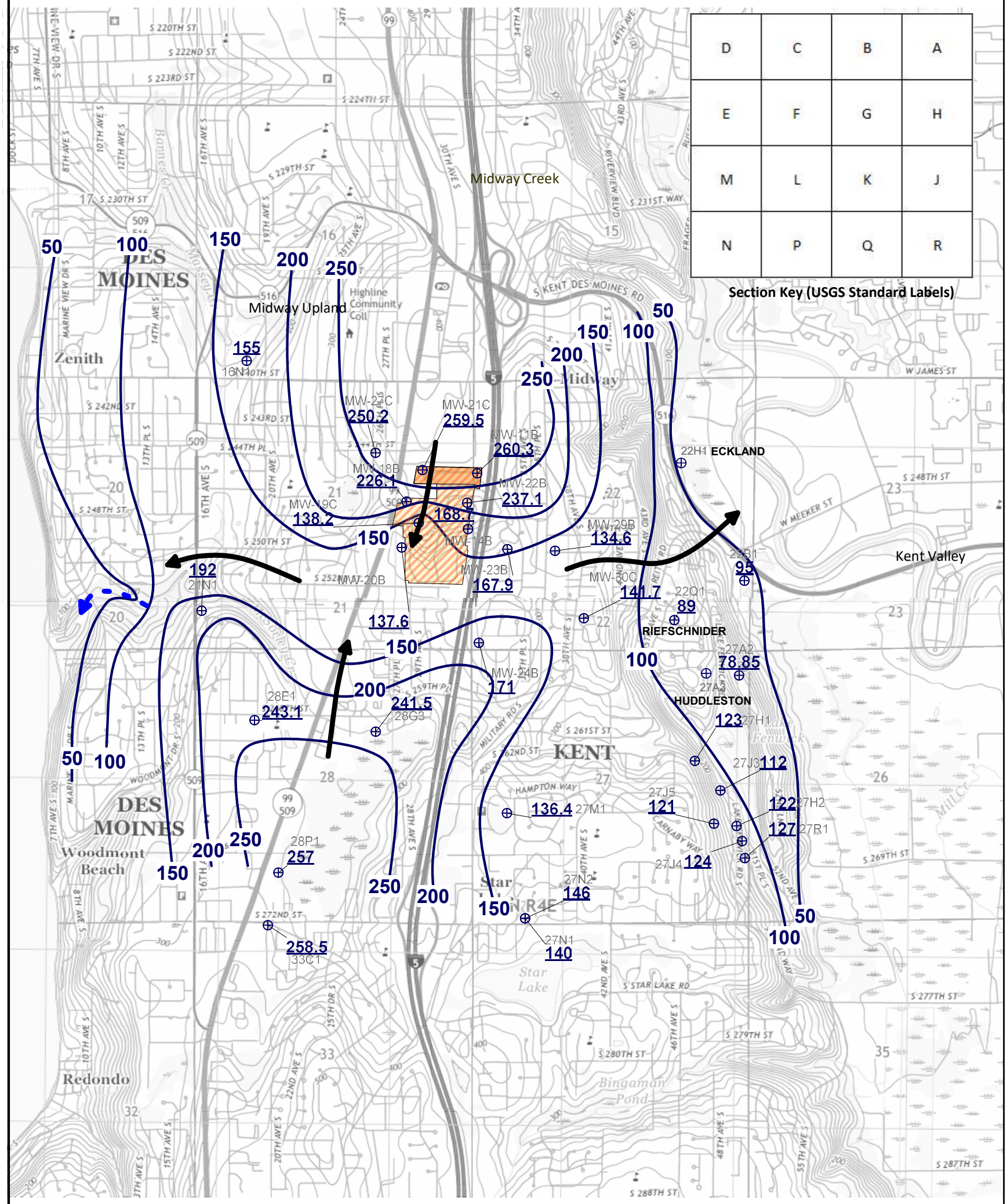
MIDWAY LANDFILL PARCELS WITH REFUSE

MIDWAY LANDFILL PARCELS WITH NO REFUSE

N

0' 2,000'

SCALE



MAP SOURCE: USGS DES MOINES AND POVERTY BAY 7.5-MIN QUADRANGLES

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Figure 13
Northern and Southern Gravel Aquifer Potentiometric Surface Map
Midway Landfill
Kent, Washington

LEGEND

MW-XX ⊕ MIDWAY MONITORING WELL LOCATION / ID

⊕ NOT IN USE, OPERABLE WATER WELL LOCATION

⊕ IN USE/ POTENTIALLY IN USE WATER WELL LOCATION

☆ MIDWAY MW TO ADD FOR WATER QUALITY

★ WATER WELL FOR WATER QUALITY PRIMARY (COLOR FOR AQUIFER)

ALLUVIAL AQUIFER WELL ID

UPPER GRAVEL AQUIFER WELL ID

SAND AQUIFER WELL ID

NORTHERN/SOUTHERN GRAVEL AQUIFER WELL ID

DEEP AQUIFER WELL ID

MIDWAY LANDFILL PARCELS WITH REFUSE

MIDWAY LANDFILL PARCELS WITH NO REFUSE

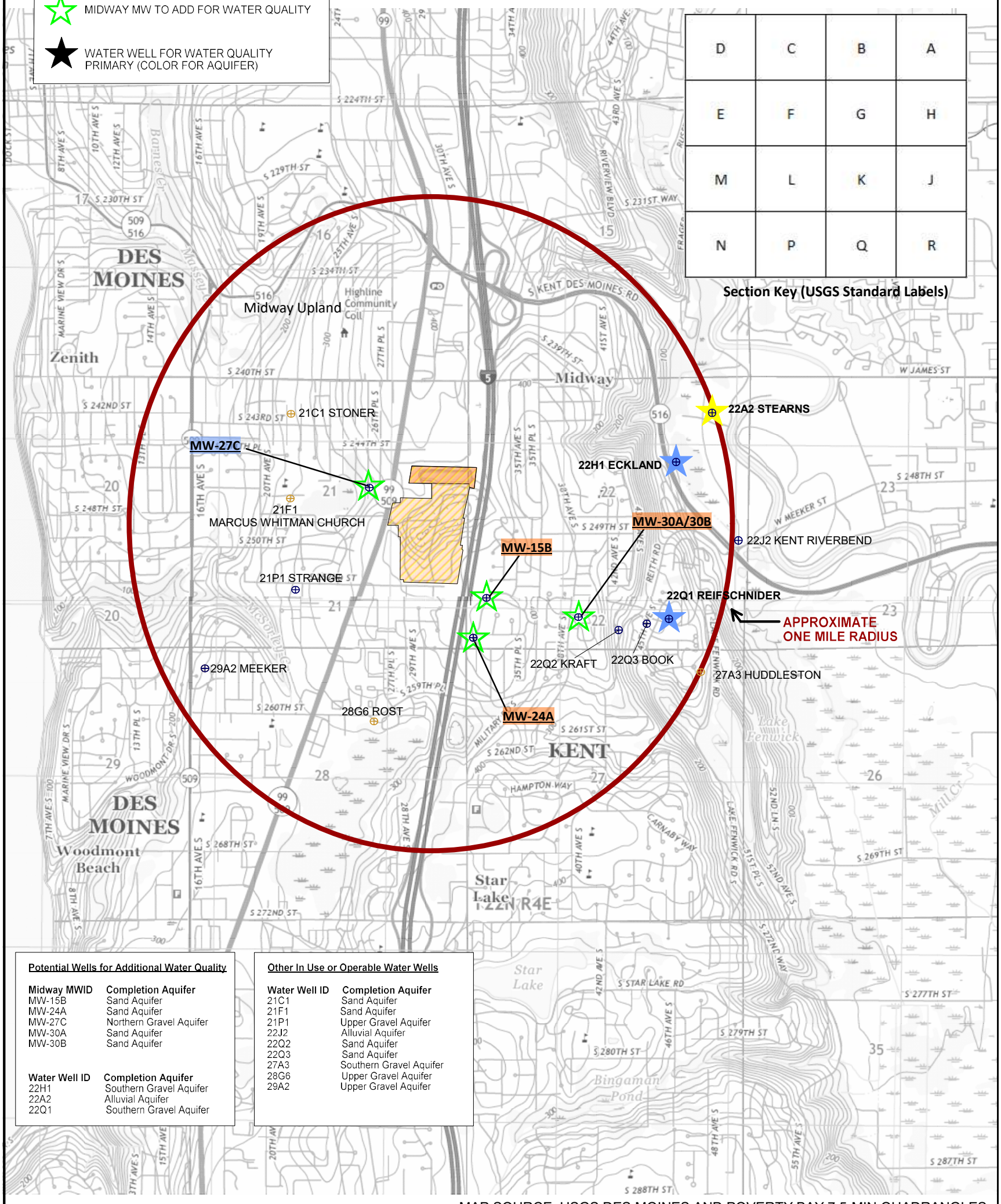
N

0' 2,000'

SCALE

D	C	B	A
E	F	G	H
M	L	K	J
N	P	Q	R

Section Key (USGS Standard Labels)



Potential Wells for Additional Water Quality

Midway MWID	Completion Aquifer
MW-15B	Sand Aquifer
MW-24A	Sand Aquifer
MW-27C	Northern Gravel Aquifer
MW-30A	Sand Aquifer
MW-30B	Sand Aquifer

Water Well ID	Completion Aquifer
22H1	Southern Gravel Aquifer
22A2	Alluvial Aquifer
22Q1	Southern Gravel Aquifer

Other In Use or Operable Water Wells

Water Well ID	Completion Aquifer
21C1	Sand Aquifer
21F1	Sand Aquifer
21P1	Upper Gravel Aquifer
22J2	Alluvial Aquifer
22Q2	Sand Aquifer
22Q3	Sand Aquifer
27A3	Southern Gravel Aquifer
28G6	Upper Gravel Aquifer
29A2	Upper Gravel Aquifer

MAP SOURCE: USGS DES MOINES AND POVERTY BAY 7.5-MIN QUADRANGLES

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Figure 14
Potential Additional Water Quality Monitoring Locations
Midway Landfill
Kent, Washington

Tables

Table 1. Midway Landfill Monitoring Well Details

Well ID	Meas Pt Elev (ft)	North	East	Screen (ft bgs)	Screen Elevation (ft)	Depth to GW (ft)	SWL Elevation (ft)	Aquifer	Water Level Monitoring	Water Quality Monitoring	Notes on Well
MW-1	365.99	143013.536	1278389.298	86 - 122	280.4 - 244.4	59.6	306.4	UGA			Abandoned
MW-2	384.39	140563.222	1277975.286	126 - 156	256.0 - 226.0	149.6	234.8	UGA	x		Well is usually dry
MW-3	416.11	140544.170	1278604.942	152.8 - 184.7	260.0 - 228.1	-	-	UGA			Well is dry
MW-4	362.82	139657.189	1278087.942	110.5 - 144.25	252.8 - 219.1	107.1	255.7	UGA	x		
MW-5	321.94	140608.626	1276491.779	47.6 - 77.5	274.8 - 244.9	61.3	260.6	UGA			Could not locate in September 2017
MW-6	271.76	137174.122	1281951.569	96.0 - 113.7	176.1 - 158.4	85.85	185.91	SA			Could not locate in September 2017
MW-7A	412.73	140527.411	1278674.548	188.3 - 197.8	225.0 - 215.5	182.82	229.91	UGA	x		Well is usually dry
MW-7B	412.73	140527.411	1278674.548	222.7 - 225.7	190.6 - 187.6	195.15	217.58	SA	x	x	
MW-8A	351.35	140101.288	1277096.707	168.5 - 179.0	183.3 - 172.8	106.8	244.6	UGA	x		
MW-8B	351.35	140101.288	1277096.707	200.9 - 206.3	150.9 - 145.5	132.4	219.0	SA	x	x	
MW-9A	353.79	141300.120	1276999.163	127.6 - 138.0	226.9 - 216.5	94.4	259.4	SA	x		New fencing, no access to well
MW-9B	353.79	141300.120	1276999.163	164.7 - 170.1	189.8 - 184.4	118.4	235.4	SA			New fencing, no access to well
MW-10A	338.77	141909.154	1277116.788	192.5 - 202.2	146.7 - 137.0	81.73	257.04	SA			
MW-10B	338.77	141909.154	1277116.788	222.9 - 231.9	116.3 - 107.3	81.83	256.94	SA			
MW-11A	370.41	142588.826	1279129.305	200.3 - 210.3	169.4 - 159.4	110.13	260.28	SA	x		
MW-11B	370.41	142588.826	1279129.305	265.8 - 271.2	103.9 - 98.5	110.13	260.28	NGA			
MW-12A	374.8	143744.753	1277650.303	233.8 - 239.2	141.4 - 136.0	112.6	262.2	SA			Abandoned, new building and pavement 2015
MW-12B	374.8	143744.753	1277650.303	255.4 - 258.4	119.8 - 116.8	112.7	262.1	SA			Abandoned, new building and pavement 2015
MW-13A	382.68	141832.070	1279884.978	109.0 - 111.9	274.2 - 271.3	106.51	276.17	UGA	x		
MW-13B	382.68	141832.070	1279884.978	196.3 - 206.8	186.9 - 176.4	128.5	254.2	SA*	x		
MW-14A	381.85	141513.128	1278951.790	277.6 - 283.0	103.4 - 98.0	208.15	173.70	SGA			
MW-14B	381.85	141513.128	1278951.790	302.0 - 307.5	79.0- 73.5	213.12	168.73	SGA	x	x	
MW-15A	438.54	140128.828	1279403.432	224.1 - 234.3	214.8 - 204.6	228.16	210.38	SA	x	x	
MW-15B	438.54	140128.828	1279403.432	260.2 - 265.7	178.7 - 173.2	229.43	209.11	SA			
MW-16	362.8	139736.588	1278164.235	161.5 - 166.9	201.7 - 196.3	121.2	241.6	UGA	x	x	
MW-17A	337.08	141918.618	1277102.356	87.8 - 98.2	249.6 - 239.2	66.83	270.3	SA	x		
MW-17B	337.08	141918.618	1277102.356	126.0 - 133.0	211.4 - 204.4	69.9	267.2	SA	x	x	
MW-18A	343.91	142044.335	1277773.804	119.0 - 129.5	223.6 - 213.1	71.98	271.9	SA	x		
MW-18B	343.91	142044.335	1277773.804	281.3 - 297.7	61.3 - 50.9	117.85	226.1	NGA			
MW-19A	370.2	141633.365	1278007.927	72.5 - 82.5	295.9 - 285.9	75.8	294.4	LA			
MW-19B	370.2	141633.365	1278007.927	168.2 - 173.2	200.2 - 195.2	151.5	218.7	UGA			Well is partially obstructed at 53 feet below ground
MW-19C	370.2	141633.365	1278007.927	292.4 - 297.6	76.0 - 70.8	232.0	138.2	SGA			Well is partially obstructed at 53 feet below ground
MW-20A	375.65	141160.550	1277678.225	190.0 - 195.0	183.7 - 178.7	159.0	216.7	SA	x		Well is usually dry
MW-20B	375.65	141160.550	1277678.225	295.0 - 300.0	78.7 - 73.7	238.0	137.7	SGA	x	x	
MW-21A	359.95	142650.909	1278075.791	85.4 - 95.4	273.1 - 263.1	83.58	276.4	UGA	x	x	
MW-21B	359.95	142650.909	1278075.791	170.4 - 180.4	188.1 - 178.1	86.79	273.2	SA	x	x	
MW-21C	359.95	142650.909	1278075.791	290.5 - 295.5	68.0 - 63.0	100.46	259.5	NGA			
MW-22A	378.28	142022.661	1278936.216	268.8 - 273.0	108.0 - 103.8	121.0	257.3	NGA			
MW-22B	378.28	142022.661	1278936.216	300.2 - 310.2	76.6 - 66.6	141.2	237.1	NGA			
MW-23A	424.42	141127.672	1279707.900	230.0 - 240.0	195.0 - 185.0	222.4	202.0	SA	x		Well is usually dry
MW-23B	424.42	141127.672	1279707.900	320.3 - 330.3	104.7 - 94.7	256.5	167.9	SGA	x	x	
MW-24A	418.58	139324.276	1279160.852	205.5 - 215.5	213.6 - 203.6	192.4	226.2	SA	x		
MW-24B	418.58	139324.276	1279160.852	350.5 - 355.5	68.6 - 63.6	247.6	171.0	SGA	x		Well is partially obstructed
MW-25A	260.84	141910.832	1276507.653	14.5 - 19.5	246.7 - 241.7	3.0	257.8	PA			Abandoned, road widening in 2009
MW-25B	260.84	141910.832	1276507.653	40.1 - 45.1	221.1 - 216.1	8.0	252.8	PA			Abandoned, road widening in 2009
MW-25C	260.84	141910.832	1276507.653	69.2 - 74.2	192.0 - 187.0	4.3	256.5	SA			Abandoned, road widening in 2009
MW-26	370.58	142610.219	1279133.869	112.0 - 117.0	257.4 - 252.4	90.3	280.3	UGA	x		
MW-27A	330.05	142983.208	1277178.173	76.9 - 87.3	253.5 - 243.1	60.57	269.5	UGA	x		
MW-27B	330.05	142983.208	1277178.173	147.6 - 153.0	182.8 - 177.4	61.02	269.0	UGA	x		
MW-27C	330.05	142983.208	1277178.173	260.0 - 265.0	70.4 - 65.4	79.85	250.2	NGA			
MW-28	374.15	143745.216	1277643.333	108.0 - 113.0	267.2 - 262.2	88.6	285.6	SA	x		
MW-29A	428.5	141098.127	1280622.620	208.1 - 218.1	220.8 - 210.8	189.8	238.7	UGA	x		
MW-29B	428.5	141098.127	1280622.620	370.0 - 377.0	58.9 - 51.9	293.9	134.6	SGA	x	x	
MW-30A	407.91	139798.650	1281175.819	182.9 - 192.9	224.6 - 214.6	168.0	239.9	SA	x		
MW-30B	407.91	139798.650	1281175.819	274.1 - 284.1	133.4 - 123.4	246.2	161.7	SA			
MW-30C	407.91	139798.650	1281175.819	345.7 - 350.7	61.8 - 56.8	266.2	141.7	SGA	x	x	

Notes:
= Active wells used for water level or water quality monitoring
= Inactive Wells not used for water level or water quality monitoring
Pumps set 2 feet above screen except for MW-13A, MW-23A, and MW-24A
Water levels from 1987 - 1989
PA = Perched Aquifer
UGA = Upper Gravel Aquifer
SA = Sand Aquifer
NGA = Northern Gravel Aquifer
SGA = Southern Gravel Aquifer
LA = Landfill Aquifer
* = Well originally reported completed in the NGA by AGI (1990)
ft = feet
bgs = below ground surface

Sources:
Hydrogeology Technical Memorandum, Appendix A for the Midway Landfill Remedial Investigation (AGI 1988)
Supplemental Hydrogeologic and Hydrochemical Investigation, Midway Landfill Feasibility Study (AGI 1990)

Table 2. 1,4-Dioxane (µg/L) in Groundwater, Midway Landfill

Well	R-48 Nov 2005	R-49 May 2006	R-50 Nov 2006	R-51 May 2007	R-52 Nov 2007	R-53 May 2008	R-54 Nov 2008	R-55 May 2009	R-56 Nov 2009	R-57 May 2010	R-58 May 2011	R-59 May 2012	R-60 May 2013	R-61 May 2014	R-62 May 2015	R-63 May 2016	R-64 May 2017	R-65 May 2018	R-66 May 2019
Upper Gravel Aquifer																			
MW-8A (Up)	--	--	--	--	--	--	--	--	--	--	--	0.4 U	--	--	--	--	--	--	--
MW-16 (Up)	--	--	--	--	--	--	--	--	--	--	2.0 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
MW-21A (Up)	--	--	--	--	--	--	--	--	--	--	2.0 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
MW-27B (Up)	--	--	--	--	--	--	--	--	--	--	--	0.4 U	--	--	--	--	--	--	--
Southern Gravel Aquifer																			
MW-14B (Down)	22	13	15	14	15	14	22	21	14	17	13	12	9.3	9.1	4.1	5.4	6.8	10.3	10.3
MW-20B (Down)	--	--	--	--	--	--	--	--	--	--	53	48	39	35	27	18	19.9	17.6	12.9
MW-23B (Down)	--	--	--	--	--	--	--	--	--	--	4.4	3.5	2.3	2.4	1.3	1.5	2.0	2.1	1.8
MW-29B (Down)	--	--	--	--	--	--	--	--	--	--	21	21	17	15	7.9	11	13.8	12.5	8.8
MW-30C (Down)	--	--	--	--	--	--	--	--	--	--	7.4	7.1	6.2	6.3	4.2	4.4	6.4	5.6	4.8
Sand Aquifer																			
MW-7B (Up)	--	--	--	--	--	--	--	--	--	--	4.3	6.0	3.4	2.0	1.0	0.6	1.0	2.0	1.3
MW-8B (Up)	--	--	--	--	--	--	--	--	--	--	2.0 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
MW-11A (Up)	--	--	--	--	--	--	--	--	--	--	--	0.4 U	--	--	--	--	--	--	--
MW-15A (Up)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
MW-17B (Up)	7.3	5.7	4.9	4.9	3.1	2.8	3.5	3.6	2.3	2.4	2.4	2.2	1.9	1.9	1.5	1.0	1.5	0.9	0.7
MW-18A (Up)	--	--	--	--	--	--	--	--	--	--	--	0.4 U	--	--	--	--	--	--	--
MW-21B (Up)	10	6.6	6.9	7.2	5.1	5.5	7	7.1	5.1	5.3	4.2	4.2	3.7	3.4	2.8	1.9	1.7	1.9	1.5
MW-28 (Up)	--	--	--	--	--	--	--	--	--	--	--	0.4 U	--	--	--	--	--	--	--

Notes: -- = Not Analyzed

Light gray font was used for non-detected values

Up or Down denotes whether the well is located upgradient or downgradient of the landfill's influence.

Table 3. Washington Sites with Historical Testing of 1,4-Dioxane Data Submitted to Ecology's EIM Database

EIM ID	Study Name	Date Range		Results Range (µg/L)		# Samples	# Sample detections	Detection Levels
				Minimum	Maxiumum			
AODE5095	Jeld Wen Inc., Former Nord Door Site (Agreed Order DE5095) Groundwater, Soil and 2009 Sediments, Everett, WA	2009	2012	<100	<500	16	0	100 to 500 µg/L
AODE5348	**Capital Industries Remedial Investigation (related to the PSC Georgetown Site)**	**2010**	**2012**	**<1**	**120**	**54**	**34**	**2 µg/L**
AODE6829	Park Laundry, Ridgefield, WA	2008	2008	<100		24	0	100 µg/L
AODE8072	**Duwamish Marine Center**	**2016**	**2016**	**<0.4**	**1.79**	**17**	**3**	**0.4 µg/L**
AODE8258	**Douglas Management Dock (Alaska Marine Lines), Seattle, WA**	**2013**	**2014**	**<0.4**	**0.4**	**53**	**1**	**0.4 µg/L**
AODE8462	Olympic View Sanitary Landfill, Port Orchard, WA	2011	2018	<9.3	<40	486	0	9.3 to 40 µg/L
DE10402	**Blaser Die Casting (related to the PSC Georgetown Site)**	**2009**	**2011**	**<2**	**150**	**8**	**6**	**2.0 µg/L**
FS1080	International Paper, Longview Historical Monitoring Data, Longview, WA	1996	1996	<2500		1	0	2500 µg/L
FS15269	Cascade Pallet, Ellensburg, WA	2013	2013	<21.4		7	0	21.4 µg/L
FS2139	**Landsburg Mine Rogers Seam, Site Groundwater Monitoring, Ravensdale, WA (PSC Site)**	**2017**	**2018**	**<0.4**	**2.3**	**47**	**15**	**0.4 µg/L**
FS2191	Universal Manufacturing/Universal Sheet Metal, Woodinville, Remedial Investigation	1996	1998	<50	<500	8	0	50 to 500 µg/L
FS2605	Remedial Action at the Hansville Landfill, Hansville, WA	2012	2018	<9.3	<40	48	0	9.3 to 40 µg/L
FS4438651	Port of Everett- Former Bay Wood Products Site, Everett, WA. Formerly AQBAYWOOD & AQBaywood2011	2009	2009	<0.1		10	0	0.1 µg/L
FS68593938	SSA Containers, Inc (formerly Reichhold Chemical), Tacoma, Soil and Groundwater RCRA Corrective Action	1989	1990	<100	<500	10	0	100 to 500 µg/L
FS787	Palouse Producers, Palouse, WA	2007	2007	<100		6	0	100 µg/L
FS88531932	**Art Brass Plating, Soil and Groundwater Cleanup - Georgetown, Seattle, WA (related to the PSC Georgetown Site)**	**2008**	**2011**	**<2**	**70**	**24**	**10**	**2 µg/L**
FS9	Kimberly-Clark Worldwide Site, Everett, WA	2012	2012	<10		8	0	10 µg/L
G0800537	**Colbert Landfill 1,4-Dioxane Project, Spokane, WA**	**2005**	**2008**	**<2**	**96**	**132**	**26**	**2 to 5 µg/L**
GTSP	Lower Duwamish Waterway Site, Multimedia sampling at the Georgetown Steam Plant (GTSP) property	2006	2006	<1		12	0	1 µg/L
PLF575	**Pasco Landfill NPL Site, Pasco, WA**	**1998**	**2013**	**<0.2**	**0.4**	**35**	**2**	**0.2 to 5 µg/L**
PSCGT106	**PSC (Philip Services Corp) Georgetown Groundwater Monitoring**	**2005**	**2018**	**<0.16**	**1,100**	**902**	**591**	**0.16 to 1 µg/L**
PSCTA103	**PSC (Philip Services Corp) Tacoma Groundwater Monitoring**	**2005**	**2017**	**<0.16**	**87**	**178**	**150**	**0.16 to 0.4 µg/L**
PSCWA104	**PSC (Philip Services Corp) Washougal, Groundwater Monitoring**	**2006**	**2018**	**<0.16**	**420**	**1902**	**615**	**0.16 to 0.4 µg/L**
RRL12862377-MSW	Roosevelt Regional Landfill- Municipal Solid Waste WAC 173-351	2014	2014	<200		7	0	200 µg/L
TBA17010004	Seaport Landing Targeted Brownfield Assessment, Former Weyerhaeuser Sawmill Aberdeen	2017	2017	<1.9	<2.0	23	0	1.9 to 2.0 µg/L
VCCE0415	Midstate Cooperative, Ellensburg, WA	2013	2013	<21.4		5	0	21.4 µg/L
FS2699	**Sisco Landfill Site**	**2010**	**2010**	**37**	**75**	**13**	**13**	**1.4 µg/L**
VCSW1012	Woodworth & Co Inc Lakeview Plant Cleanup	2017	2017	<0.096	<1	3	0	0.096 to 0.1 µg/L
VCSW1039	Morrells Dry Cleaners, Tacoma, WA	2014	2014	<10		1	0	10 µg/L
VCSW1040	Walker Chevrolet (Bruce Titus Chevrolet), Tacoma, WA	2014	2015	<0.4	<10	2	0	0.4 to 10 µg/L
VCSW1095	Estes Express Lines Terminal Facility (Formerly USF Reddaway Terminal Facility) Subsurface Investigation, Tacoma, WA	2009	2009	<10		5	0	10 µg/L
VCSW1658	Port Angeles Red Lion	2016	2016	<0.4		20	0	0.4 µg/L
WSLCB	Washington State Liquor Control Board Reconnaissance Investigation	2011	2011	<1		8	0	1 µg/L
					TOTAL SAMPLES	4075	1466	

Note: Light gray font was used for non-detected values

Source: Washington State Department of Ecology (Ecology) – EIM Database, available online at https://fortress.wa.gov/ecy/eimreporting/
EIM Database reviewed on 7/15/2019
EIM Data taken from groundwater samples only

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5301300	Alderwood Water District	1	Everett Intertie	2/11/2013	<0.07
WA5301300	Alderwood Water District	1	Everett Intertie	5/8/2013	<0.07
WA5301300	Alderwood Water District	1	Everett Intertie	8/15/2013	<0.07
WA5301300	Alderwood Water District	1	Everett Intertie	11/6/2013	<0.07
WA5302950	Arlington Water Department	3296	Airport Well Field	6/3/2013	<0.07
WA5302950	Arlington Water Department	3296	Airport Well Field	12/12/2013	<0.07
WA5302950	Arlington Water Department	3297	Haller Well Field	6/3/2013	<0.07
WA5302950	Arlington Water Department	3297	Haller Well Field	9/25/2013	<0.07
WA5302950	Arlington Water Department	3297	Haller Well Field	12/12/2013	<0.07
WA5302950	Arlington Water Department	3297	Haller Well Field	3/4/2014	<0.07
WA5302950	Arlington Water Department	3298	PUD Intertie	6/3/2013	<0.07
WA5302950	Arlington Water Department	3298	PUD Intertie	9/25/2013	<0.07
WA5302950	Arlington Water Department	3298	PUD Intertie	12/12/2013	<0.07
WA5302950	Arlington Water Department	3298	PUD Intertie	3/4/2014	<0.07
WA5395904	Birch Bay Water & Sewer District	90001	Blaine Rd. Pump Station	2/19/2013	<0.07
WA5395904	Birch Bay Water & Sewer District	90001	Blaine Rd. Pump Station	8/13/2013	<0.07
WA5395904	Birch Bay Water & Sewer District	90002	Semiahmoo Intertie	2/19/2013	<0.07
WA5395904	Birch Bay Water & Sewer District	90002	Semiahmoo Intertie	8/13/2013	<0.07
WA5395904	Birch Bay Water & Sewer District	90003	Horizons Intertie	2/19/2013	<0.07
WA5395904	Birch Bay Water & Sewer District	90003	Horizons Intertie	8/13/2013	<0.07
WA5309100	Bucoda Water Dept.	90001	Well #1	6/3/2014	<0.07
WA5309100	Bucoda Water Dept.	90001	Well #1	12/4/2014	<0.07
WA5309100	Bucoda Water Dept.	90002	Well #2	6/3/2014	<0.07
WA5309100	Bucoda Water Dept.	90002	Well #2	12/4/2014	<0.07
WA5310800	Camas Municipal Water Sewer System	6	Deep Well #13	6/17/2013	<0.07
WA5310800	Camas Municipal Water Sewer System	6	Deep Well #13	11/20/2013	<0.07
WA5310800	Camas Municipal Water Sewer System	7	Deep Well #14	6/17/2013	<0.07
WA5310800	Camas Municipal Water Sewer System	7	Deep Well #14	11/20/2013	<0.07
WA5310800	Camas Municipal Water Sewer System	11	Well #9	8/14/2013	<0.07
WA5310800	Camas Municipal Water Sewer System	11	Well #9	7/22/2014	<0.07
WA5310800	Camas Municipal Water Sewer System	96	Oak Park Wellfield	6/17/2013	<0.07
WA5310800	Camas Municipal Water Sewer System	96	Oak Park Wellfield	11/20/2013	<0.07
WA5311100	Carbonado Water Dept.	90001	Water Treatment Plant #1	3/10/2015	<0.07
WA5311100	Carbonado Water Dept.	90001	Water Treatment Plant #1	6/8/2015	<0.07
WA5311100	Carbonado Water Dept.	90001	Water Treatment Plant #1	9/14/2015	<0.07
WA5311100	Carbonado Water Dept.	90001	Water Treatment Plant #1	12/7/2015	<0.07
WA5311700	Cashmere Water Department	90001	Water Treatment Plant	1/22/2013	<0.07
WA5311700	Cashmere Water Department	90001	Water Treatment Plant	4/16/2013	<0.07
WA5311700	Cashmere Water Department	90001	Water Treatment Plant	7/23/2013	<0.07
WA5311700	Cashmere Water Department	90001	Water Treatment Plant	10/29/2013	<0.07
WA5311700	Cashmere Water Department	90002	Well #10	1/22/2013	<0.07
WA5311700	Cashmere Water Department	90002	Well #10	7/23/2013	<0.07
WA5311700	Cashmere Water Department	90003	Well #4	1/22/2013	<0.07
WA5311700	Cashmere Water Department	90003	Well #4	7/23/2013	<0.07
WA5311800	Castle Rock Municipal Water	90001	Castle Rock WTP	1/22/2014	<0.07
WA5311800	Castle Rock Municipal Water	90001	Castle Rock WTP	4/21/2014	<0.07
WA5311800	Castle Rock Municipal Water	90001	Castle Rock WTP	8/4/2014	<0.07
WA5311800	Castle Rock Municipal Water	90001	Castle Rock WTP	10/20/2014	<0.07
WA5341800	Cedar River Water & Sewer District	17363	Seattle Intertie	4/20/2015	<0.07
WA5341800	Cedar River Water & Sewer District	17363	Seattle Intertie	6/3/2015	<0.07
WA5341800	Cedar River Water & Sewer District	17363	Seattle Intertie	9/8/2015	<0.07
WA5341800	Cedar River Water & Sewer District	17363	Seattle Intertie	12/2/2015	<0.07
WA5341800	Cedar River Water & Sewer District	17364	East Well	5/18/2015	<0.07
WA5341800	Cedar River Water & Sewer District	17364	East Well	10/5/2015	<0.07
WA5312200	Centralia Utilities	3	K Street Well	4/23/2013	<0.07
WA5312200	Centralia Utilities	3	K Street Well	12/2/2013	<0.07
WA5312200	Centralia Utilities	9	Tennis Court WF (Wells 1 & 2)	4/23/2013	<0.07
WA5312200	Centralia Utilities	9	Tennis Court WF (Wells 1 & 2)	12/2/2013	<0.07
WA5312200	Centralia Utilities	16	Port District Wellfield	4/23/2013	<0.07
WA5312200	Centralia Utilities	16	Port District Wellfield	12/2/2013	<0.07
WA5312250	Chehalis Water Department	1	Main Reservoir	12/9/2013	<0.07
WA5312250	Chehalis Water Department	1	Main Reservoir	3/5/2014	<0.07
WA5312250	Chehalis Water Department	1	Main Reservoir	6/4/2014	<0.07
WA5312250	Chehalis Water Department	1	Main Reservoir	9/3/2014	<0.07
WA5312284	Chelan County PUD #1	10597	Wen Regional Intertie	4/25/2015	<0.07
WA5312284	Chelan County PUD #1	10597	Wen Regional Intertie	10/8/2015	<0.07
WA5312350	Chelan Falls Water District	90001	Chelan Falls Well	4/21/2015	<0.07
WA5312350	Chelan Falls Water District	90001	Chelan Falls Well	10/20/2015	<0.07
WA5300050	City of Aberdeen	950	Aberdeen Water Department	2/10/2015	<0.07
WA5300050	City of Aberdeen	950	Aberdeen Water Department	5/14/2015	<0.07
WA5300050	City of Aberdeen	950	Aberdeen Water Department	8/11/2015	<0.07
WA5300050	City of Aberdeen	950	Aberdeen Water Department	11/16/2015	<0.07
WA5302200	City of Anacortes	1	Skagit River	4/30/2013	<0.07
WA5303350	City of Auburn Water Division	1	Spring #1 (Coal Creek)	3/18/2014	<0.07
WA5303350	City of Auburn Water Division	1	Spring #1 (Coal Creek)	9/23/2014	<0.07
WA5303350	City of Auburn Water Division	2	Spring #2 (West Hill)	4/1/2014	<0.07
WA5303350	City of Auburn Water Division	2	Spring #2 (West Hill)	9/30/2014	<0.07
WA5303350	City of Auburn Water Division	6	Well #5	3/11/2014	<0.07
WA5303350	City of Auburn Water Division	6	Well #5	9/16/2014	<0.07
WA5303350	City of Auburn Water Division	7	Well #4	3/18/2014	<0.07
WA5303350	City of Auburn Water Division	7	Well #4	9/23/2014	<0.07
WA5303350	City of Auburn Water Division	10	Well #5A	3/11/2014	<0.07
WA5303350	City of Auburn Water Division	10	Well #5A	9/16/2014	<0.07
WA5303350	City of Auburn Water Division	18	Tacoma Water Intertie	3/13/2014	<0.07
WA5303350	City of Auburn Water Division	18	Tacoma Water Intertie	6/11/2014	<0.07
WA5303350	City of Auburn Water Division	18	Tacoma Water Intertie	9/9/2014	<0.07
WA5303350	City of Auburn Water Division	18	Tacoma Water Intertie	12/9/2014	<0.07
WA5397650	City of Bainbridge Island	2110	Fletcher Bay Well	1/15/2014	<0.07
WA5397650	City of Bainbridge Island	2110	Fletcher Bay Well	7/7/2014	<0.07
WA5397650	City of Bainbridge Island	2111	Sands Avenue Wells	1/15/2014	<0.07
WA5397650	City of Bainbridge Island	2111	Sands Avenue Wells	7/7/2014	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5397650	City of Bainbridge Island	2112	Head of Bay	1/21/2014	<0.07
WA5397650	City of Bainbridge Island	2112	Head of Bay	7/8/2014	<0.07
WA5397650	City of Bainbridge Island	2113	Commodore Well	1/21/2014	<0.07
WA5397650	City of Bainbridge Island	2113	Commodore Well	7/9/2014	<0.07
WA5304700	City of Battle Ground Water Department	2122	Wells 1 & 2	4/28/2015	<0.07
WA5304700	City of Battle Ground Water Department	2122	Wells 1 & 2	10/14/2015	<0.07
WA5304700	City of Battle Ground Water Department	2123	Wells 4 & 5	4/28/2015	<0.07
WA5304700	City of Battle Ground Water Department	2123	Wells 4 & 5	10/14/2015	<0.07
WA5304700	City of Battle Ground Water Department	2126	Wells 7, 8 & 9	4/28/2015	<0.07
WA5304700	City of Battle Ground Water Department	2126	Wells 7, 8 & 9	10/14/2015	<0.07
WA5305575	City of Bellevue	6163	Seattle Tolt/Kirkland/Redmond Intertie	5/21/2013	<0.07
WA5305575	City of Bellevue	6163	Seattle Tolt/Kirkland/Redmond Intertie	8/22/2013	<0.07
WA5305575	City of Bellevue	6163	Seattle Tolt/Kirkland/Redmond Intertie	11/20/2013	<0.07
WA5305575	City of Bellevue	6163	Seattle Tolt/Kirkland/Redmond Intertie	2/24/2014	<0.07
WA5305575	City of Bellevue	6165	Seattle Intertie - Cedar Supply	5/21/2013	<0.07
WA5305575	City of Bellevue	6165	Seattle Intertie - Cedar Supply	8/22/2013	<0.07
WA5305575	City of Bellevue	6165	Seattle Intertie - Cedar Supply	11/20/2013	<0.07
WA5305575	City of Bellevue	6165	Seattle Intertie - Cedar Supply	2/24/2014	<0.07
WA5305600	City of Bellingham Water Division	90001	Treatment Plant	10/1/2013	<0.07
WA5305600	City of Bellingham Water Division	90001	Treatment Plant	1/7/2014	<0.07
WA5305600	City of Bellingham Water Division	90001	Treatment Plant	4/8/2014	<0.07
WA5305600	City of Bellingham Water Division	90001	Treatment Plant	7/8/2014	<0.07
WA5307650	City of Bonney Lake Water Department	1	Victor Falls Spring Treatment	8/20/2013	<0.07
WA5307650	City of Bonney Lake Water Department	1	Victor Falls Spring Treatment	2/19/2014	<0.07
WA5307650	City of Bonney Lake Water Department	2	Grainger Springs Treatment	8/20/2013	<0.07
WA5307650	City of Bonney Lake Water Department	2	Grainger Springs Treatment	2/19/2014	<0.07
WA5307650	City of Bonney Lake Water Department	12	Tacoma Pt. Wells #2 & #4 Treatment	8/20/2013	<0.07
WA5307650	City of Bonney Lake Water Department	12	Tacoma Pt. Wells #2 & #4 Treatment	2/19/2014	<0.07
WA5307650	City of Bonney Lake Water Department	15	Ball Park Wells Treatment	9/25/2013	<0.07
WA5307650	City of Bonney Lake Water Department	15	Ball Park Wells Treatment	8/19/2014	<0.07
WA5307650	City of Bonney Lake Water Department	8447	Tacoma Water Intertie	8/20/2013	<0.07
WA5307650	City of Bonney Lake Water Department	8447	Tacoma Water Intertie	12/17/2013	<0.07
WA5307650	City of Bonney Lake Water Department	8447	Tacoma Water Intertie	2/19/2014	<0.07
WA5307650	City of Bonney Lake Water Department	8447	Tacoma Water Intertie	5/7/2014	<0.07
WA5307900	City of Bothell Water	8723	Seattle Intertie	3/16/2015	<0.07
WA5307900	City of Bothell Water	8723	Seattle Intertie	6/17/2015	<0.07
WA5307900	City of Bothell Water	8723	Seattle Intertie	9/15/2015	<0.07
WA5307900	City of Bothell Water	8723	Seattle Intertie	12/7/2015	<0.07
WA5308200	City of Bremerton	950	T1 Surface/Groundwater	9/4/2013	<0.07
WA5308200	City of Bremerton	950	T1 Surface/Groundwater	12/4/2013	<0.07
WA5308200	City of Bremerton	950	T1 Surface/Groundwater	3/4/2014	<0.07
WA5308200	City of Bremerton	950	T1 Surface/Groundwater	6/3/2014	<0.07
WA5308200	City of Bremerton	951	T2 Anderson Creek	9/4/2013	<0.07
WA5308200	City of Bremerton	951	T2 Anderson Creek	3/4/2014	<0.07
WA5308200	City of Bremerton	952	T3 Manette Aquifer	9/4/2013	<0.07
WA5308200	City of Bremerton	952	T3 Manette Aquifer	3/4/2014	<0.07
WA5320500	City of Dupont Water System	2393	Bell Hill 1, 2,3	4/8/2014	<0.07
WA5320500	City of Dupont Water System	2393	Bell Hill 1, 2,3	10/13/2014	<0.07
WA5320500	City of Dupont Water System	2394	Hoffman Hill Well #1	4/8/2014	<0.07
WA5320500	City of Dupont Water System	2394	Hoffman Hill Well #1	10/13/2014	<0.07
WA5320500	City of Dupont Water System	3921	Hoffman Hill Well #2	4/8/2014	<0.07
WA5320500	City of Dupont Water System	3921	Hoffman Hill Well #2	10/13/2014	<0.07
WA5322500	City of Edmonds	1	Everett Intertie	1/15/2013	<0.07
WA5322500	City of Edmonds	1	Everett Intertie	4/15/2013	<0.07
WA5322500	City of Edmonds	1	Everett Intertie	7/31/2013	<0.07
WA5322500	City of Edmonds	1	Everett Intertie	10/21/2013	<0.07
WA5324050	City of Everett Public Works Department	20000	Everett Water Treatment Plant	1/23/2014	<0.07
WA5324050	City of Everett Public Works Department	20000	Everett Water Treatment Plant	4/16/2014	<0.07
WA5324050	City of Everett Public Works Department	20000	Everett Water Treatment Plant	7/22/2014	<0.07
WA5324050	City of Everett Public Works Department	20000	Everett Water Treatment Plant	10/15/2014	<0.07
WA5338000	City of Kelso	2	Ranney	4/23/2014	<0.07
WA5338000	City of Kelso	2	Ranney	7/29/2014	<0.07
WA5338000	City of Kelso	2	Ranney	10/23/2014	<0.07
WA5338000	City of Kelso	2	Ranney	1/27/2015	<0.07
WA5338100	City of Kennewick	6	Columbia River	4/22/2014	<0.07
WA5338100	City of Kennewick	6	Columbia River	7/15/2014	<0.07
WA5338100	City of Kennewick	6	Columbia River	10/17/2014	<0.07
WA5338100	City of Kennewick	7	Ranney Collector #4 & #5 Wellfield	4/22/2014	<0.07
WA5338100	City of Kennewick	7	Ranney Collector #4 & #5 Wellfield	7/15/2014	<0.07
WA5338100	City of Kennewick	7	Ranney Collector #4 & #5 Wellfield	10/17/2014	<0.07
WA5342250	City of Kirkland	17495	Seattle Intertie	8/6/2014	<0.07
WA5342250	City of Kirkland	17495	Seattle Intertie	2/25/2015	<0.07
WA5342250	City of Kirkland	17495	Seattle Intertie	5/6/2015	<0.07
WA5349270	City of Lynnwood	19020	Alderwood Intertie	3/9/2015	<0.07
WA5349270	City of Lynnwood	19020	Alderwood Intertie	9/10/2015	<0.07
WA5353640	City of Mercer Island	19890	Seattle Intertie	3/19/2013	<0.07
WA5353640	City of Mercer Island	19890	Seattle Intertie	6/11/2013	<0.07
WA5353640	City of Mercer Island	19890	Seattle Intertie	9/17/2013	<0.07
WA5353640	City of Mercer Island	19890	Seattle Intertie	12/10/2013	<0.07
WA5356300	City of Moses Lake	2903	Well #11	5/18/2015	<0.07
WA5356300	City of Moses Lake	2903	Well #11	11/10/2015	<0.07
WA5356300	City of Moses Lake	2905	Well #12	5/6/2014	<0.07
WA5356300	City of Moses Lake	2905	Well #12	11/18/2014	<0.07
WA5356300	City of Moses Lake	2906	Well #8	5/5/2014	<0.07
WA5356300	City of Moses Lake	2906	Well #8	11/18/2014	<0.07
WA5356300	City of Moses Lake	2907	Well #4	5/5/2014	<0.07
WA5356300	City of Moses Lake	2907	Well #4	11/13/2014	<0.07
WA5356300	City of Moses Lake	2909	Well #7	5/5/2014	<0.07
WA5356300	City of Moses Lake	2909	Well #7	11/13/2014	<0.07
WA5356300	City of Moses Lake	2910	Well #10	5/5/2014	<0.07
WA5356300	City of Moses Lake	2910	Well #10	11/13/2014	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5356300	City of Moses Lake	2912	Well #14	5/6/2014	<0.07
WA5356300	City of Moses Lake	2912	Well #14	11/13/2014	<0.07
WA5356300	City of Moses Lake	2916	Well #23	5/18/2015	<0.07
WA5356300	City of Moses Lake	2916	Well #23	11/10/2015	<0.07
WA5356300	City of Moses Lake	2918	Well #24	5/6/2014	<0.07
WA5356300	City of Moses Lake	2922	Well #29	11/10/2014	<0.07
WA5356300	City of Moses Lake	2924	Well #17	5/7/2014	<0.07
WA5356300	City of Moses Lake	2924	Well #17	11/17/2014	<0.07
WA5356300	City of Moses Lake	2926	Well #18	5/8/2014	<0.07
WA5356300	City of Moses Lake	2926	Well #18	11/18/2014	<0.07
WA5356300	City of Moses Lake	90001	Well #19	5/5/2014	<0.07
WA5356300	City of Moses Lake	90001	Well #19	11/17/2014	<0.07
WA5356300	City of Moses Lake	90002	Well #31	5/12/2014	<0.07
WA5356300	City of Moses Lake	90002	Well #31	11/17/2014	<0.07
WA5357250	City of Mountlake Terrace	20693	Alderwood Intertie	7/11/2013	<0.07
WA5357250	City of Mountlake Terrace	20693	Alderwood Intertie	12/10/2013	<0.07
WA5357250	City of Mountlake Terrace	20693	Alderwood Intertie	1/14/2014	<0.07
WA5357250	City of Mountlake Terrace	20693	Alderwood Intertie	4/8/2014	<0.07
WA5362650	City of Oak Harbor	21568	Anacortes Intertie	7/9/2013	<0.07
WA5362650	City of Oak Harbor	21568	Anacortes Intertie	10/8/2013	<0.07
WA5362650	City of Oak Harbor	21568	Anacortes Intertie	1/7/2014	<0.07
WA5362650	City of Oak Harbor	21568	Anacortes Intertie	4/10/2014	<0.07
WA5363450	City of Olympia	1	McAllister Springs	2/14/2013	<0.07
WA5363450	City of Olympia	1	McAllister Springs	5/20/2013	<0.07
WA5363450	City of Olympia	1	McAllister Springs	8/5/2013	<0.07
WA5363450	City of Olympia	1	McAllister Springs	11/13/2013	<0.07
WA5363450	City of Olympia	3	Well #1 (Kaiser)	5/20/2013	<0.07
WA5363450	City of Olympia	3	Well #1 (Kaiser)	11/13/2013	<0.07
WA5363450	City of Olympia	8	Well #3 (Hoffman)	5/20/2013	<0.07
WA5363450	City of Olympia	8	Well #3 (Hoffman)	11/13/2013	<0.07
WA5363450	City of Olympia	9	Well #13 (Allison)	5/20/2013	<0.07
WA5363450	City of Olympia	9	Well #13 (Allison)	11/13/2013	<0.07
WA5363450	City of Olympia	10	Well #11 (Shana Park)	5/20/2013	<0.07
WA5363450	City of Olympia	10	Well #11 (Shana Park)	11/13/2013	<0.07
WA5363450	City of Olympia	11	Well #19 (Allison)	5/20/2013	<0.07
WA5363450	City of Olympia	11	Well #19 (Allison)	11/13/2013	<0.07
WA5363450	City of Olympia	12	Well #20 (Indian Summer)	5/20/2013	<0.07
WA5363450	City of Olympia	12	Well #20 (Indian Summer)	11/13/2013	<0.07
WA5368550	City of Port Angeles	1	Elwha Pump Station	10/6/2014	<0.07
WA5368550	City of Port Angeles	1	Elwha Pump Station	3/4/2015	<0.07
WA5368550	City of Port Angeles	1	Elwha Pump Station	6/23/2015	<0.07
WA5368550	City of Port Angeles	1	Elwha Pump Station	9/30/2015	<0.07
WA5369150	City of Poulsbo Water System	90001	Lincoln Well	9/30/2014	<0.07
WA5369150	City of Poulsbo Water System	90002	Big Valley Well #1 (USGS)	9/30/2014	<0.07
WA5369150	City of Poulsbo Water System	90003	Pugh Well	9/30/2014	<0.07
WA5369150	City of Poulsbo Water System	90004	Big Valley Well #2	9/30/2014	<0.07
WA5369150	City of Poulsbo Water System	90005	Finn Hill / Nike Well	9/30/2014	<0.07
WA5369150	City of Poulsbo Water System	90006	Westside Well	9/30/2014	<0.07
WA5369750	City of Prosser	90001	Filter Plant	1/5/2015	<0.07
WA5369750	City of Prosser	90001	Filter Plant	7/27/2015	<0.07
WA5369880	City of Pullman Water Department	3	Well 8	4/16/2014	<0.07
WA5369880	City of Pullman Water Department	3	Well 8	10/13/2014	<0.07
WA5369880	City of Pullman Water Department	4	Well 4	4/17/2014	<0.07
WA5369880	City of Pullman Water Department	4	Well 4	10/14/2014	<0.07
WA5369880	City of Pullman Water Department	5	Well 5	4/16/2014	<0.07
WA5369880	City of Pullman Water Department	5	Well 5	10/13/2014	<0.07
WA5369880	City of Pullman Water Department	6	Well 6	4/17/2014	<0.07
WA5369880	City of Pullman Water Department	6	Well 6	10/14/2014	<0.07
WA5369880	City of Pullman Water Department	8	Well 7	4/16/2014	<0.07
WA5369880	City of Pullman Water Department	8	Well 7	10/13/2014	<0.07
WA5370050	City of Puyallup	1	Salmon SP	2/3/2015	<0.07
WA5370050	City of Puyallup	1	Salmon SP	8/6/2015	<0.07
WA5370050	City of Puyallup	2	Maplewood SP	2/3/2015	<0.07
WA5370050	City of Puyallup	2	Maplewood SP	8/6/2015	<0.07
WA5370050	City of Puyallup	3	Well #13 (15th & 9th St.)	2/3/2015	<0.07
WA5370050	City of Puyallup	3	Well #13 (15th & 9th St.)	8/6/2015	<0.07
WA5370050	City of Puyallup	5	Well #33 (23rd Ave. SE)	2/3/2015	<0.07
WA5370050	City of Puyallup	5	Well #33 (23rd Ave. SE)	8/6/2015	<0.07
WA5370050	City of Puyallup	7	Cherokee Park Well	2/3/2015	<0.07
WA5370050	City of Puyallup	7	Cherokee Park Well	8/6/2015	<0.07
WA5370050	City of Puyallup	8	Rec-Center Well	2/3/2015	<0.07
WA5370050	City of Puyallup	8	Rec-Center Well	8/6/2015	<0.07
WA5370050	City of Puyallup	9	96th Street Well	2/3/2015	<0.07
WA5370050	City of Puyallup	9	96th Street Well	8/6/2015	<0.07
WA5370050	City of Puyallup	22834	Tacoma Intertie	2/3/2015	<0.07
WA5370050	City of Puyallup	22834	Tacoma Intertie	5/5/2015	<0.07
WA5370050	City of Puyallup	22834	Tacoma Intertie	8/6/2015	<0.07
WA5370050	City of Puyallup	22834	Tacoma Intertie	11/17/2015	<0.07
WA5371650	City of Redmond Water System	3	Well #3	6/25/2014	<0.07
WA5371650	City of Redmond Water System	3	Well #3	12/17/2014	<0.07
WA5371650	City of Redmond Water System	4	Well #4	8/18/2015	<0.07
WA5371650	City of Redmond Water System	4	Well #4	12/15/2015	<0.07
WA5371650	City of Redmond Water System	7	Well #5	6/25/2014	<0.07
WA5371650	City of Redmond Water System	7	Well #5	12/17/2014	<0.07
WA5371650	City of Redmond Water System	8	Well #1 & Well #2 Combined	6/25/2014	<0.07
WA5371650	City of Redmond Water System	8	Well #1 & Well #2 Combined	12/17/2014	<0.07
WA5371650	City of Redmond Water System	22973	Seattle Intertie	6/25/2014	<0.07
WA5371650	City of Redmond Water System	22973	Seattle Intertie	9/24/2014	<0.07
WA5371650	City of Redmond Water System	22973	Seattle Intertie	12/17/2014	<0.07
WA5371650	City of Redmond Water System	22973	Seattle Intertie	3/4/2015	<0.07
WA5371850	City of Renton	5	Springbrook Springs	8/6/2014	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5371850	City of Renton	5	Springbrook Springs	2/4/2015	<0.07
WA5371850	City of Renton	7	Well 8 (PW-8)	8/6/2014	<0.07
WA5371850	City of Renton	7	Well 8 (PW-8)	2/4/2015	<0.07
WA5371850	City of Renton	10	Wells 1, 2 & 3	8/6/2014	<0.07
WA5371850	City of Renton	10	Wells 1, 2 & 3	2/4/2015	<0.07
WA5371850	City of Renton	13	Wells 11, 12 & 17	8/6/2014	<0.07
WA5371850	City of Renton	13	Wells 11, 12 & 17	2/4/2015	<0.07
WA5372250	City of Richland	1	Columbia River	6/3/2014	<0.07
WA5372250	City of Richland	1	Columbia River	9/9/2014	<0.07
WA5372250	City of Richland	1	Columbia River	12/2/2014	<0.07
WA5372250	City of Richland	1	Columbia River	3/10/2015	<0.07
WA5372250	City of Richland	2	WLSN WY/S12-15	6/3/2014	<0.07
WA5372250	City of Richland	2	WLSN WY/S12-15	12/2/2014	<0.07
WA5372250	City of Richland	4	N. Richland Slow Sand Filter Facility	6/3/2014	<0.07
WA5372250	City of Richland	4	N. Richland Slow Sand Filter Facility	9/9/2014	<0.07
WA5372250	City of Richland	4	N. Richland Slow Sand Filter Facility	1/13/2015	<0.07
WA5372250	City of Richland	4	N. Richland Slow Sand Filter Facility	2/24/2015	<0.07
WA5372250	City of Richland	5	Columbia Well	6/3/2014	<0.07
WA5372250	City of Richland	5	Columbia Well	12/2/2014	<0.07
WA5377400	City of Selah	90001	Well #5	6/17/2014	<0.07
WA5377400	City of Selah	90001	Well #5	12/8/2014	<0.07
WA5377400	City of Selah	90002	Well #6	6/17/2014	<0.07
WA5377400	City of Selah	90002	Well #6	12/8/2014	<0.07
WA5377400	City of Selah	90003	Well #7	6/17/2014	<0.07
WA5377400	City of Selah	90003	Well #7	12/8/2014	<0.07
WA5377400	City of Selah	90004	Well #8	6/17/2014	<0.07
WA5377400	City of Selah	90004	Well #8	12/8/2014	<0.07
WA5377620	City of Sequim	2267	Dungeness River Ranney Well	12/15/2014	<0.07
WA5377620	City of Sequim	2267	Dungeness River Ranney Well	6/2/2015	<0.07
WA5377620	City of Sequim	2268	Silberhorn Wellfield	12/15/2014	<0.07
WA5377620	City of Sequim	2268	Silberhorn Wellfield	6/2/2015	<0.07
WA5377620	City of Sequim	2269	Port Williams Wellfield	12/15/2014	<0.07
WA5377620	City of Sequim	2269	Port Williams Wellfield	6/2/2015	<0.07
WA5378170	City of Shelton	2220	Well #1 & #3	3/10/2014	<0.07
WA5378170	City of Shelton	2220	Well #1 & #3	9/9/2014	<0.07
WA5378170	City of Shelton	4107	Well #4	3/10/2014	<0.07
WA5378170	City of Shelton	4107	Well #4	9/9/2014	<0.07
WA5383100	City of Spokane	1	Nevada Street	3/23/2015	<0.07
WA5383100	City of Spokane	1	Nevada Street	9/28/2015	<0.07
WA5383100	City of Spokane	3	Park Water	3/23/2015	<0.07
WA5383100	City of Spokane	3	Park Water	9/28/2015	<0.07
WA5383100	City of Spokane	4	Ray Street	3/23/2015	<0.07
WA5383100	City of Spokane	4	Ray Street	9/28/2015	<0.07
WA5383100	City of Spokane	5	Hoffman Avenue	3/23/2015	<0.07
WA5383100	City of Spokane	5	Hoffman Avenue	9/28/2015	<0.07
WA5383100	City of Spokane	8	Central Avenue	3/23/2015	<0.07
WA5383100	City of Spokane	8	Central Avenue	9/28/2015	<0.07
WA5383650	City of Stanwood Water Department	3793	Cedarhome Well	1/12/2015	<0.07
WA5383650	City of Stanwood Water Department	3793	Cedarhome Well	7/6/2015	<0.07
WA5383650	City of Stanwood Water Department	3802	Bryant Wells	1/12/2015	<0.07
WA5383650	City of Stanwood Water Department	3802	Bryant Wells	7/6/2015	<0.07
WA5385400	City of Sunnyside	6	Well 6	3/31/2014	<0.07
WA5385400	City of Sunnyside	6	Well 6	9/3/2014	<0.07
WA5385400	City of Sunnyside	7	Well 7	3/31/2014	<0.07
WA5385400	City of Sunnyside	7	Well 7	9/3/2014	<0.07
WA5385400	City of Sunnyside	8	Well 8	3/31/2014	<0.07
WA5385400	City of Sunnyside	8	Well 8	9/3/2014	<0.07
WA5385400	City of Sunnyside	9	Well 9	3/31/2014	<0.07
WA5385400	City of Sunnyside	9	Well 9	9/3/2014	<0.07
WA5385400	City of Sunnyside	11	Well 11	3/31/2014	<0.07
WA5385400	City of Sunnyside	11	Well 11	9/3/2014	<0.07
WA5386800	City of Tacoma Water Division	1	Green River	3/10/2015	<0.07
WA5386800	City of Tacoma Water Division	1	Green River	6/9/2015	<0.07
WA5386800	City of Tacoma Water Division	1	Green River	9/9/2015	<0.07
WA5386800	City of Tacoma Water Division	1	Green River	12/2/2015	<0.07
WA5386800	City of Tacoma Water Division	4	UP-1	7/8/2015	<0.07
WA5386800	City of Tacoma Water Division	4	UP-1	12/7/2015	<0.07
WA5386800	City of Tacoma Water Division	5	SE-2&6	7/9/2015	<0.07
WA5386800	City of Tacoma Water Division	5	SE-2&6	12/9/2015	<0.07
WA5386800	City of Tacoma Water Division	6	SE11&11A	7/6/2015	<0.07
WA5386800	City of Tacoma Water Division	6	SE11&11A	12/10/2015	<0.07
WA5386800	City of Tacoma Water Division	8	South Tacoma Pump Station	8/6/2014	<0.07
WA5386800	City of Tacoma Water Division	8	South Tacoma Pump Station	3/10/2015	<0.07
WA5386800	City of Tacoma Water Division	950	Tacoma Treatment Plant	3/10/2015	<0.07
WA5386800	City of Tacoma Water Division	950	Tacoma Treatment Plant	6/17/2015	<0.07
WA5386800	City of Tacoma Water Division	950	Tacoma Treatment Plant	9/9/2015	<0.07
WA5386800	City of Tacoma Water Division	950	Tacoma Treatment Plant	12/1/2015	<0.07
WA5386800	City of Tacoma Water Division	90001	Portland Ave. Well	7/9/2015	<0.07
WA5386800	City of Tacoma Water Division	90001	Portland Ave. Well	12/7/2015	<0.07
WA5386800	City of Tacoma Water Division	90002	Gravity Pipeline Well #2	6/29/2015	<0.07
WA5386800	City of Tacoma Water Division	90002	Gravity Pipeline Well #2	12/8/2015	<0.07
WA5386800	City of Tacoma Water Division	90003	Prairie Springs	10/13/2015	<0.07
WA5386800	City of Tacoma Water Division	90003	Prairie Springs	12/8/2015	<0.07
WA5389700	City of Tumwater	2	Source 2	8/13/2014	<0.07
WA5389700	City of Tumwater	2	Source 2	2/11/2015	<0.07
WA5389700	City of Tumwater	14	Source 14	8/20/2014	<0.07
WA5389700	City of Tumwater	14	Source 14	2/11/2015	<0.07
WA5389700	City of Tumwater	15	Source 15	8/13/2014	<0.07
WA5389700	City of Tumwater	15	Source 15	2/11/2015	<0.07
WA5389700	City of Tumwater	21	Source 21	8/13/2014	<0.07
WA5389700	City of Tumwater	21	Source 21	2/11/2015	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5389700	City of Tumwater	22	Source 22	8/13/2014	<0.07
WA5389700	City of Tumwater	22	Source 22	2/11/2015	<0.07
WA5389700	City of Tumwater	23	Source 23	8/13/2014	<0.07
WA5389700	City of Tumwater	23	Source 23	2/11/2015	<0.07
WA5391200	City of Vancouver	1	W. S. #1	5/28/2013	0.11
WA5391200	City of Vancouver	1	W. S. #1	11/19/2013	0.072
WA5391200	City of Vancouver	2	W. S. #3	5/28/2013	0.13
WA5391200	City of Vancouver	2	W. S. #3	11/19/2013	0.17
WA5391200	City of Vancouver	3	W. S. #4	5/28/2013	<0.07
WA5391200	City of Vancouver	3	W. S. #4	11/19/2013	<0.07
WA5391200	City of Vancouver	5	W. S. #7/Well #1	6/17/2013	<0.07
WA5391200	City of Vancouver	5	W. S. #7/Well #1	11/19/2013	<0.07
WA5391200	City of Vancouver	6	W. S. #8	5/28/2013	0.093
WA5391200	City of Vancouver	6	W. S. #8	11/19/2013	<0.07
WA5391200	City of Vancouver	7	W. S. #9	5/28/2013	0.076
WA5391200	City of Vancouver	7	W. S. #9	11/19/2013	<0.07
WA5391200	City of Vancouver	8	W. S. #14	5/28/2013	0.25
WA5391200	City of Vancouver	8	W. S. #14	11/19/2013	0.21
WA5391200	City of Vancouver	9	W. S. #15	5/28/2013	<0.07
WA5391200	City of Vancouver	9	W. S. #15	11/19/2013	<0.07
WA5391200	City of Vancouver	11	Ellsworth WTP	5/28/2013	<0.07
WA5391200	City of Vancouver	11	Ellsworth WTP	11/19/2013	<0.07
WA5393400	City of Washougal	2309	Hathaway Park	8/20/2013	<0.07
WA5393400	City of Washougal	2310	Westside	8/20/2013	<0.07
WA5393400	City of Washougal	2310	Westside	10/7/2014	<0.07
WA5393400	City of Washougal	90001	Well #11 TP	8/20/2013	<0.07
WA5394350	City of Wenatchee	2825	Wellfield	12/3/2014	<0.07
WA5394350	City of Wenatchee	2825	Wellfield	6/2/2015	<0.07
WA5394900	City of West Richland	2767	Central Well 1	10/17/2013	<0.07
WA5394900	City of West Richland	2767	Central Well 1	4/10/2014	<0.07
WA5394900	City of West Richland	2769	Flattop Well 2	10/7/2013	<0.07
WA5394900	City of West Richland	2769	Flattop Well 2	4/10/2014	<0.07
WA5394900	City of West Richland	2779	Well 7	10/7/2013	<0.07
WA5394900	City of West Richland	2779	Well 7	4/10/2014	<0.07
WA5394900	City of West Richland	2780	Well 9	10/7/2013	<0.07
WA5394900	City of West Richland	2780	Well 9	4/10/2014	<0.07
WA5394900	City of West Richland	2782	Richland Intertie	1/15/2014	<0.07
WA5394900	City of West Richland	2782	Richland Intertie	4/10/2014	<0.07
WA5394900	City of West Richland	2782	Richland Intertie	7/7/2014	<0.07
WA5399150	City of Yakima Water Division	1	Naches River WTP	3/2/2015	<0.07
WA5399150	City of Yakima Water Division	1	Naches River WTP	6/22/2015	<0.07
WA5399150	City of Yakima Water Division	1	Naches River WTP	9/9/2015	<0.07
WA5399150	City of Yakima Water Division	1	Naches River WTP	12/21/2015	<0.07
WA5399150	City of Yakima Water Division	2	Airport Well	3/3/2015	<0.07
WA5399150	City of Yakima Water Division	2	Airport Well	9/16/2015	<0.07
WA5399150	City of Yakima Water Division	3	Kiwanis Well	3/3/2015	<0.07
WA5399150	City of Yakima Water Division	3	Kiwanis Well	9/16/2015	<0.07
WA5399150	City of Yakima Water Division	10	Gardner Well	3/3/2015	<0.07
WA5399150	City of Yakima Water Division	10	Gardner Well	9/9/2015	<0.07
WA5313333	Clark Public Utilities	5	Well 5 HAZ S05	6/11/2015	<0.07
WA5313333	Clark Public Utilities	5	Well 5 HAZ S05	12/21/2015	<0.07
WA5313333	Clark Public Utilities	20	Well 19 HAZ S20	5/19/2015	<0.07
WA5313333	Clark Public Utilities	20	Well 19 HAZ S20	11/19/2015	<0.07
WA5313333	Clark Public Utilities	22	Well 20 HAZ S22	11/19/2014	<0.07
WA5313333	Clark Public Utilities	22	Well 20 HAZ S22	4/28/2015	<0.07
WA5313333	Clark Public Utilities	24	Well 22 HAZ S24	11/19/2014	0.36
WA5313333	Clark Public Utilities	24	Well 22 HAZ S24	4/28/2015	0.36
WA5313333	Clark Public Utilities	28	Well 27 HAZ S28	11/20/2014	<0.07
WA5313333	Clark Public Utilities	28	Well 27 HAZ S28	5/19/2015	<0.07
WA5313333	Clark Public Utilities	30	Well 30 HAZ S30	9/17/2013	<0.07
WA5313333	Clark Public Utilities	30	Well 30 HAZ S30	3/26/2014	<0.07
WA5313333	Clark Public Utilities	31	Well 31 HAZ S31	9/17/2013	<0.07
WA5313333	Clark Public Utilities	31	Well 31 HAZ S31	3/26/2014	<0.07
WA5313333	Clark Public Utilities	33	Well104 HOC S04	6/11/2014	<0.07
WA5313333	Clark Public Utilities	33	Well104 HOC S04	12/10/2014	<0.07
WA5313333	Clark Public Utilities	38	Well110 HOC S09	6/11/2015	<0.07
WA5313333	Clark Public Utilities	38	Well110 HOC S09	12/21/2015	<0.07
WA5313333	Clark Public Utilities	43	Well 26 MG S06	6/11/2015	<0.07
WA5313333	Clark Public Utilities	43	Well 26 MG S06	12/21/2015	<0.07
WA5310221	Consolidated Irrig. Dist. #19, System #2	90001	Wells 1A, 1B, 1C	4/23/2015	<0.07
WA5310221	Consolidated Irrig. Dist. #19, System #2	90001	Wells 1A, 1B, 1C	10/13/2015	<0.07
WA5310221	Consolidated Irrig. Dist. #19, System #2	90002	Wells 2A, 2B, 2C	4/23/2015	<0.07
WA5310221	Consolidated Irrig. Dist. #19, System #2	90002	Wells 2A, 2B, 2C	10/13/2015	<0.07
WA5310221	Consolidated Irrig. Dist. #19, System #2	90003	Wells 3A, 3B, 3C	4/23/2015	<0.07
WA5310221	Consolidated Irrig. Dist. #19, System #2	90003	Wells 3A, 3B, 3C	10/13/2015	<0.07
WA5310221	Consolidated Irrig. Dist. #19, System #2	90004	Wells 4A, 4B, 4C, 4D	4/23/2015	<0.07
WA5310221	Consolidated Irrig. Dist. #19, System #2	90004	Wells 4A, 4B, 4C, 4D	10/13/2015	<0.07
WA5341650	Covington Water District	4	Witte #1, 2, 3 & 4	7/29/2015	<0.07
WA5341650	Covington Water District	13	222nd Pl. A,C,D,E,F	5/27/2015	<0.07
WA5341650	Covington Water District	13	222nd Pl. A,C,D,E,F	11/18/2015	<0.07
WA5341650	Covington Water District	18	264th Well	7/29/2015	<0.07
WA5341650	Covington Water District	27828	Tacoma Intertie	2/25/2015	<0.07
WA5341650	Covington Water District	27828	Tacoma Intertie	5/27/2015	<0.07
WA5341650	Covington Water District	27828	Tacoma Intertie	7/29/2015	<0.07
WA5341650	Covington Water District	27828	Tacoma Intertie	11/18/2015	<0.07
WA5316270	Cross Valley Water District	12	Woodlane	4/3/2013	<0.07
WA5316270	Cross Valley Water District	12	Woodlane	10/9/2013	<0.07
WA5316270	Cross Valley Water District	15	Wells 5, 6 & 10	4/3/2013	<0.07
WA5316270	Cross Valley Water District	15	Wells 5, 6 & 10	10/9/2013	<0.07
WA5316270	Cross Valley Water District	17	Wells 1 & 9	4/3/2013	<0.07
WA5316270	Cross Valley Water District	17	Wells 1 & 9	10/9/2013	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5316270	Cross Valley Water District	18	Wells 3 & 8	4/3/2013	<0.07
WA5316270	Cross Valley Water District	18	Wells 3 & 8	10/9/2013	<0.07
WA5316270	Cross Valley Water District	19	Wells 7 & 7A	4/3/2013	<0.07
WA5316270	Cross Valley Water District	19	Wells 7 & 7A	10/9/2013	<0.07
WA5306536	Diamond Point Water System	90001	Diamond Point Booster	5/14/2013	<0.07
WA5306536	Diamond Point Water System	90001	Diamond Point Booster	11/13/2013	<0.07
WA5302348	Eagle Estates	90001	Pumphouse	4/9/2013	<0.07
WA5302348	Eagle Estates	90001	Pumphouse	10/28/2013	<0.07
WA5321800	East Wenaatchee Water District	12845	Wen Regional Intertie	12/2/2014	<0.07
WA5321800	East Wenaatchee Water District	12845	Wen Regional Intertie	7/27/2015	<0.07
WA5321900	Eastern Washington University	4163	Well #1	3/2/2015	<0.07
WA5321900	Eastern Washington University	4163	Well #1	8/19/2015	<0.07
WA5322950	Ellensburg Water Department	1	City Wells	4/22/2013	<0.07
WA5322950	Ellensburg Water Department	1	City Wells	10/14/2013	<0.07
WA5322950	Ellensburg Water Department	5	Kiwanis Park Well	4/22/2013	<0.07
WA5322950	Ellensburg Water Department	5	Kiwanis Park Well	10/14/2013	<0.07
WA5323600	Enumclaw Water Department	1	Boise Spring	1/6/2014	<0.07
WA5323600	Enumclaw Water Department	1	Boise Spring	7/2/2014	<0.07
WA5323600	Enumclaw Water Department	2	Watercress Springs Combined	1/6/2014	<0.07
WA5323600	Enumclaw Water Department	2	Watercress Springs Combined	7/2/2014	<0.07
WA5323600	Enumclaw Water Department	7	PC Johnson Wellfield	9/15/2015	<0.07
WA5324850	Ferndale	13642	Water Treatment Plant	3/25/2014	<0.07
WA5324850	Ferndale	13642	Water Treatment Plant	9/9/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	3	Well #3 (E. 154th St.)	12/12/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	3	Well #3 (E. 154th St.)	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	6	Well #6 (Regis Park)	11/17/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	6	Well #6 (Regis Park)	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	10	E. 164th St.	11/17/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	10	E. 164th St.	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	14	Well #14 (E. 97th Ave.)	2/13/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	14	Well #14 (E. 97th Ave.)	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	16	Well #16 (E. 70th Ave.)	11/17/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	16	Well #16 (E. 70th Ave.)	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	20	Well #20	11/17/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	20	Well #20	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	21	Wells #13 & #18	11/17/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	21	Wells #13 & #18	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	26	Wells #12 & #22	11/17/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	26	Wells #12 & #22	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	13764	Tacoma Intertie	11/17/2014	<0.07
WA5325200	Firgrove Mutual, Inc.	13764	Tacoma Intertie	2/13/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	13764	Tacoma Intertie	5/18/2015	<0.07
WA5325200	Firgrove Mutual, Inc.	13764	Tacoma Intertie	8/21/2015	<0.07
WA5326050	Fort Lewis Water - Cantonment	1	Sequalitchew Spring	6/11/2014	<0.07
WA5326050	Fort Lewis Water - Cantonment	1	Sequalitchew Spring	12/29/2014	<0.07
WA5326050	Fort Lewis Water - Cantonment	3	Well #12A	3/17/2015	<0.07
WA5326050	Fort Lewis Water - Cantonment	3	Well #12A	9/2/2015	<0.07
WA5326050	Fort Lewis Water - Cantonment	4	Well #14	6/9/2014	<0.07
WA5326050	Fort Lewis Water - Cantonment	4	Well #14	12/29/2014	<0.07
WA5326050	Fort Lewis Water - Cantonment	5	Well #17	6/10/2014	<0.07
WA5326050	Fort Lewis Water - Cantonment	5	Well #17	12/29/2014	<0.07
WA5326050	Fort Lewis Water - Cantonment	6	Well #13	3/17/2015	<0.07
WA5326050	Fort Lewis Water - Cantonment	6	Well #13	9/2/2015	<0.07
WA5326050	Fort Lewis Water - Cantonment	7	Well #12B	3/17/2015	<0.07
WA5326050	Fort Lewis Water - Cantonment	7	Well #12B	9/2/2015	<0.07
WA5326050	Fort Lewis Water - Cantonment	8	Well #20	6/10/2014	<0.07
WA5326050	Fort Lewis Water - Cantonment	8	Well #20	12/29/2014	<0.07
WA5326050	Fort Lewis Water - Cantonment	9	MAMC Well #4	3/18/2015	<0.07
WA5326050	Fort Lewis Water - Cantonment	9	MAMC Well #4	9/14/2015	<0.07
WA5326800	Fruitland Mutual Water Company	2581	Well 3	3/6/2013	<0.07
WA5326800	Fruitland Mutual Water Company	2581	Well 3	9/16/2013	<0.07
WA5326800	Fruitland Mutual Water Company	2582	Well 4	12/16/2013	<0.07
WA5326800	Fruitland Mutual Water Company	2582	Well 4	6/2/2014	<0.07
WA5326800	Fruitland Mutual Water Company	2583	Well 5A	3/6/2013	<0.07
WA5326800	Fruitland Mutual Water Company	2583	Well 5A	9/17/2013	<0.07
WA5326800	Fruitland Mutual Water Company	2585	Well 2A	3/6/2013	<0.07
WA5326800	Fruitland Mutual Water Company	2585	Well 2A	9/17/2013	<0.07
WA5340650	Highline Water District	5	Wellfield (DesMoines/Angle Lake)	4/23/2014	<0.07
WA5340650	Highline Water District	5	Wellfield (DesMoines/Angle Lake)	10/28/2014	<0.07
WA5340650	Highline Water District	7	Tyee Well	4/23/2014	<0.07
WA5340650	Highline Water District	7	Tyee Well	10/28/2014	<0.07
WA5340650	Highline Water District	17205	SPU and McMicken TP water comingled	4/23/2014	<0.07
WA5340650	Highline Water District	17205	SPU and McMicken TP water comingled	7/23/2014	<0.07
WA5340650	Highline Water District	17205	SPU and McMicken TP water comingled	10/28/2014	<0.07
WA5340650	Highline Water District	17205	SPU and McMicken TP water comingled	1/20/2015	<0.07
WA5336350	Issaquah Water System	1	Well #1	7/22/2013	<0.07
WA5336350	Issaquah Water System	1	Well #1	1/8/2014	<0.07
WA5336350	Issaquah Water System	2	Well #2	7/22/2013	<0.07
WA5336350	Issaquah Water System	2	Well #2	1/8/2014	<0.07
WA5336350	Issaquah Water System	4	Well #4	7/22/2013	<0.07
WA5336350	Issaquah Water System	4	Well #4	1/8/2014	<0.07
WA5336350	Issaquah Water System	5	Well #5	7/22/2013	<0.07
WA5336350	Issaquah Water System	5	Well #5	1/8/2014	<0.07
WA5338150	Kent Water Department	1	Kent Springs & Soos Creek Blending Point	3/4/2013	<0.07
WA5338150	Kent Water Department	1	Kent Springs & Soos Creek Blending Point	12/26/2013	<0.07
WA5338150	Kent Water Department	2	Clark Springs & Armstrong Springs Blending Point	3/4/2013	<0.07
WA5338150	Kent Water Department	2	Clark Springs & Armstrong Springs Blending Point	12/26/2013	<0.07
WA5338150	Kent Water Department	5	East Hill Well	3/4/2013	<0.07
WA5338150	Kent Water Department	5	East Hill Well	12/26/2013	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5338150	Kent Water Department	6	Garrison Creek Well	3/4/2013	<0.07
WA5338150	Kent Water Department	6	Garrison Creek Well	12/26/2013	<0.07
WA5338150	Kent Water Department	10	Wells @ 208th & 212th Streets Blending Point	3/4/2013	<0.07
WA5338150	Kent Water Department	10	Wells @ 208th & 212th Streets Blending Point	12/26/2013	<0.07
WA5338150	Kent Water Department	12	O'Brien Well	3/4/2013	<0.07
WA5338150	Kent Water Department	12	O'Brien Well	12/26/2013	<0.07
WA5341900	King County Water District #111	4	Well #3	8/20/2013	<0.07
WA5341900	King County Water District #111	4	Well #3	2/25/2014	<0.07
WA5341900	King County Water District #111	6	Well #5	8/20/2013	<0.07
WA5341900	King County Water District #111	6	Well #5	2/25/2014	<0.07
WA5341900	King County Water District #111	7	Well #6	8/20/2013	<0.07
WA5341900	King County Water District #111	7	Well #6	2/25/2014	<0.07
WA5341900	King County Water District #111	8	Well #9	8/20/2013	<0.07
WA5341900	King County Water District #111	8	Well #9	2/25/2014	<0.07
WA5341998	King County Water District #125	17445	Seattle Intertie	11/17/2014	<0.07
WA5341998	King County Water District #125	17445	Seattle Intertie	2/3/2015	<0.07
WA5341998	King County Water District #125	17445	Seattle Intertie	5/11/2015	<0.07
WA5341998	King County Water District #125	17445	Seattle Intertie	8/3/2015	<0.07
WA5338950	King County Water District #20	17011	Seattle Intertie	10/15/2013	<0.07
WA5338950	King County Water District #20	17011	Seattle Intertie	1/8/2014	<0.07
WA5338950	King County Water District #20	17011	Seattle Intertie	4/1/2014	<0.07
WA5338950	King County Water District #20	17011	Seattle Intertie	7/9/2014	<0.07
WA5339800	King County Water District #49	17096	Seattle Intertie	2/18/2014	<0.07
WA5339800	King County Water District #49	17096	Seattle Intertie	5/19/2014	<0.07
WA5339800	King County Water District #49	17096	Seattle Intertie	8/5/2014	<0.07
WA5339800	King County Water District #49	17096	Seattle Intertie	11/13/2014	<0.07
WA5341150	King County Water District #90	2441	Wojewodski Well	7/29/2014	<0.07
WA5341150	King County Water District #90	2441	Wojewodski Well	2/26/2015	<0.07
WA5341150	King County Water District #90	17277	Seattle Intertie	7/29/2014	<0.07
WA5341150	King County Water District #90	17277	Seattle Intertie	10/28/2014	<0.07
WA5341150	King County Water District #90	17277	Seattle Intertie	2/26/2015	0.077
WA5341150	King County Water District #90	17277	Seattle Intertie	4/16/2015	<0.07
WA5343500	Lacey Water Department	1	Well 1	12/2/2014	<0.07
WA5343500	Lacey Water Department	1	Well 1	6/29/2015	<0.07
WA5343500	Lacey Water Department	2	S02	12/2/2014	<0.07
WA5343500	Lacey Water Department	2	S02	6/29/2015	<0.07
WA5343500	Lacey Water Department	4	Well 4	12/2/2014	<0.07
WA5343500	Lacey Water Department	4	Well 4	8/24/2015	<0.07
WA5343500	Lacey Water Department	6	Well 6	12/3/2014	<0.07
WA5343500	Lacey Water Department	6	Well 6	6/29/2015	<0.07
WA5343500	Lacey Water Department	7	Well 7	12/3/2014	<0.07
WA5343500	Lacey Water Department	7	Well 7	6/29/2015	<0.07
WA5343500	Lacey Water Department	9	Well 9	12/2/2014	<0.07
WA5343500	Lacey Water Department	9	Well 9	6/29/2015	<0.07
WA5343500	Lacey Water Department	10	Well 10	12/4/2014	<0.07
WA5343500	Lacey Water Department	10	Well 10	6/29/2015	<0.07
WA5343500	Lacey Water Department	15	S15	12/3/2014	<0.07
WA5343500	Lacey Water Department	15	S15	6/30/2015	<0.07
WA5343500	Lacey Water Department	19	Hawks Prairie Well 1	12/3/2014	<0.07
WA5343500	Lacey Water Department	19	Hawks Prairie Well 1	6/30/2015	<0.07
WA5343500	Lacey Water Department	22	S22	12/3/2014	<0.07
WA5343500	Lacey Water Department	22	S22	6/30/2015	<0.07
WA5343500	Lacey Water Department	25	Nisqually Well 19C	12/4/2014	<0.07
WA5343500	Lacey Water Department	25	Nisqually Well 19C	6/30/2015	<0.07
WA5343500	Lacey Water Department	29	Betti Well	12/3/2014	<0.07
WA5343500	Lacey Water Department	29	Betti Well	6/30/2015	0.076
WA5343500	Lacey Water Department	29337	Olympia Intertie - SW	12/4/2014	<0.07
WA5343500	Lacey Water Department	90001	Olympia Intertie - GW	6/30/2015	<0.07
WA5341997	Lakehaven Utility District	2531	Well 10	8/6/2013	<0.07
WA5341997	Lakehaven Utility District	2531	Well 10	1/13/2014	<0.07
WA5341997	Lakehaven Utility District	2532	Well 7	8/6/2013	<0.07
WA5341997	Lakehaven Utility District	2532	Well 7	1/22/2014	<0.07
WA5341997	Lakehaven Utility District	2533	Well 9	8/6/2013	<0.07
WA5341997	Lakehaven Utility District	2533	Well 9	1/22/2014	<0.07
WA5341997	Lakehaven Utility District	2535	Well 10A	8/6/2013	<0.07
WA5341997	Lakehaven Utility District	2535	Well 10A	7/22/2014	<0.07
WA5341997	Lakehaven Utility District	2536	Wells 15 & 15A	8/6/2013	<0.07
WA5341997	Lakehaven Utility District	2536	Wells 15 & 15A	1/13/2014	<0.07
WA5341997	Lakehaven Utility District	2537	Well 16	8/12/2013	<0.07
WA5341997	Lakehaven Utility District	2537	Well 16	1/22/2014	<0.07
WA5341997	Lakehaven Utility District	2538	Wells 17, 17A, & 17B	8/27/2013	<0.07
WA5341997	Lakehaven Utility District	2538	Wells 17, 17A, & 17B	4/16/2014	<0.07
WA5341997	Lakehaven Utility District	2540	Well 18	8/12/2013	<0.07
WA5341997	Lakehaven Utility District	2540	Well 18	1/13/2014	<0.07
WA5341997	Lakehaven Utility District	2541	Wells 19 & 19A	8/26/2013	<0.07
WA5341997	Lakehaven Utility District	2541	Wells 19 & 19A	7/22/2014	<0.07
WA5341997	Lakehaven Utility District	2542	Wells 20, 20A & 33	8/12/2013	<0.07
WA5341997	Lakehaven Utility District	2542	Wells 20, 20A & 33	5/13/2014	<0.07
WA5341997	Lakehaven Utility District	2543	Wells 22, 22A & 22B	8/20/2013	<0.07
WA5341997	Lakehaven Utility District	2543	Wells 22, 22A & 22B	7/1/2014	<0.07
WA5341997	Lakehaven Utility District	2544	Wells 23 & 23A	8/6/2013	<0.07
WA5341997	Lakehaven Utility District	2544	Wells 23 & 23A	6/3/2014	<0.07
WA5341997	Lakehaven Utility District	17431	Well 21	8/12/2013	<0.07
WA5341997	Lakehaven Utility District	17431	Well 21	7/22/2014	<0.07
WA5341997	Lakehaven Utility District	17440	Well 25	8/20/2013	<0.07
WA5341997	Lakehaven Utility District	17440	Well 25	1/22/2014	<0.07
WA5341997	Lakehaven Utility District	90001	Well 29	8/20/2013	<0.07
WA5341997	Lakehaven Utility District	90001	Well 29	7/8/2014	<0.07
WA5341997	Lakehaven Utility District	99003	Second Supply Pipeline SSP2	1/21/2014	<0.07
WA5341997	Lakehaven Utility District	99003	Second Supply Pipeline SSP2	4/22/2014	<0.07
WA5341997	Lakehaven Utility District	99003	Second Supply Pipeline SSP2	7/9/2014	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5341997	Lakehaven Utility District	99003	Second Supply Pipeline SSP2	9/30/2014	<0.07
WA5345550	Lakewood Water District	3	Interlaaken D-3	5/7/2013	<0.07
WA5345550	Lakewood Water District	3	Interlaaken D-3	10/23/2013	<0.07
WA5345550	Lakewood Water District	7	G-1 & G-2 Scott	5/8/2013	<0.07
WA5345550	Lakewood Water District	7	G-1 & G-2 Scott	10/22/2013	<0.07
WA5345550	Lakewood Water District	16	View Rd. N-2	5/7/2013	<0.07
WA5345550	Lakewood Water District	16	View Rd. N-2	10/22/2013	<0.07
WA5345550	Lakewood Water District	19	112th & Deepwood Q-1	5/7/2013	<0.07
WA5345550	Lakewood Water District	19	112th & Deepwood Q-1	10/22/2013	<0.07
WA5345550	Lakewood Water District	21	R-1 112th St. Site	5/8/2013	<0.07
WA5345550	Lakewood Water District	21	R-1 112th St. Site	10/23/2013	<0.07
WA5306461	Larch Corrections Center	90001	Well #3	6/10/2015	<0.07
WA5306461	Larch Corrections Center	90001	Well #3	12/16/2015	<0.07
WA5306461	Larch Corrections Center	90002	Well #4	6/10/2015	<0.07
WA5306461	Larch Corrections Center	90002	Well #4	12/16/2015	<0.07
WA5348100	Longview Water Department	1	Water Treatment Plant	10/31/2013	<0.07
WA5348100	Longview Water Department	1	Water Treatment Plant	4/22/2014	<0.07
WA5349150	Lynden Water Department	1420	Nooksack	1/14/2014	<0.07
WA5349150	Lynden Water Department	1420	Nooksack	4/8/2014	<0.07
WA5349150	Lynden Water Department	1420	Nooksack	7/8/2014	<0.07
WA5349150	Lynden Water Department	1420	Nooksack	10/14/2014	<0.07
WA5350700	Manchester Water District	2693	Wells #5 & #8	5/12/2015	<0.07
WA5350700	Manchester Water District	2693	Wells #5 & #8	3/23/2016	<0.07
WA5350700	Manchester Water District	2694	Wells #6 & #7	3/18/2015	<0.07
WA5350700	Manchester Water District	2694	Wells #6 & #7	9/24/2015	<0.07
WA5350700	Manchester Water District	2695	Well #9	6/29/2015	<0.07
WA5350700	Manchester Water District	4224	Wells #1 & #2	3/18/2015	<0.07
WA5350700	Manchester Water District	4224	Wells #1 & #2	9/24/2015	<0.07
WA5350700	Manchester Water District	4225	Well #11	3/18/2015	<0.07
WA5350700	Manchester Water District	4225	Well #11	9/24/2015	<0.07
WA5350700	Manchester Water District	90001	Well #10	3/18/2015	<0.07
WA5350700	Manchester Water District	90001	Well #10	9/24/2015	<0.07
WA5351900	Marysville Utilities	1	GWI Edwards Spring	8/11/2014	<0.07
WA5351900	Marysville Utilities	1	GWI Edwards Spring	11/4/2014	<0.07
WA5351900	Marysville Utilities	1	GWI Edwards Spring	2/3/2015	<0.07
WA5351900	Marysville Utilities	1	GWI Edwards Spring	5/5/2015	<0.07
WA5351900	Marysville Utilities	4	GWI Stilli Well	8/11/2014	<0.07
WA5351900	Marysville Utilities	4	GWI Stilli Well	11/4/2014	<0.07
WA5351900	Marysville Utilities	4	GWI Stilli Well	2/3/2015	<0.07
WA5351900	Marysville Utilities	4	GWI Stilli Well	5/5/2015	<0.07
WA5351900	Marysville Utilities	5	GW Lake Goodwin Well	8/11/2014	<0.07
WA5351900	Marysville Utilities	5	GW Lake Goodwin Well	2/4/2015	<0.07
WA5351900	Marysville Utilities	19513	Everett Intertie	8/11/2014	<0.07
WA5351900	Marysville Utilities	19513	Everett Intertie	11/4/2014	<0.07
WA5351900	Marysville Utilities	19513	Everett Intertie	2/3/2015	<0.07
WA5351900	Marysville Utilities	19513	Everett Intertie	5/5/2015	<0.07
WA5355550	Model Irrigation Dist. #18	90001	Well #1	1/7/2014	<0.07
WA5355550	Model Irrigation Dist. #18	90002	Well #3	6/11/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90002	Well #3	12/12/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90003	Well #4	6/11/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90003	Well #4	12/12/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90004	Well #5	6/11/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90004	Well #5	12/12/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90005	Well #6	6/11/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90005	Well #6	12/12/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90006	Well #7	6/11/2013	<0.07
WA5355550	Model Irrigation Dist. #18	90006	Well #7	12/12/2013	<0.07
WA5355600	Modern Electric Water Co.	2	Well 2	5/30/2014	<0.07
WA5355600	Modern Electric Water Co.	2	Well 2	1/12/2015	<0.07
WA5355600	Modern Electric Water Co.	3	Well 3	10/13/2014	<0.07
WA5355600	Modern Electric Water Co.	3	Well 3	9/14/2015	<0.07
WA5355600	Modern Electric Water Co.	4	Well 4	10/13/2014	<0.07
WA5355600	Modern Electric Water Co.	4	Well 4	9/14/2015	<0.07
WA5355600	Modern Electric Water Co.	6	Well 6	10/13/2014	<0.07
WA5355600	Modern Electric Water Co.	6	Well 6	9/14/2015	<0.07
WA5355600	Modern Electric Water Co.	8	Well 8	10/13/2014	<0.07
WA5355600	Modern Electric Water Co.	8	Well 8	9/14/2015	<0.07
WA5355600	Modern Electric Water Co.	9	Well 9	5/30/2014	<0.07
WA5355600	Modern Electric Water Co.	9	Well 9	1/12/2015	<0.07
WA5355600	Modern Electric Water Co.	11	Well 11	10/13/2014	<0.07
WA5355600	Modern Electric Water Co.	11	Well 11	9/14/2015	<0.07
WA5355820	Monroe Water System	20354	Everett Intertie	4/2/2013	<0.07
WA5355820	Monroe Water System	20354	Everett Intertie	7/11/2013	<0.07
WA5355820	Monroe Water System	20354	Everett Intertie	10/9/2013	<0.07
WA5355820	Monroe Water System	20354	Everett Intertie	1/7/2014	<0.07
WA5357550	Mukilteo Water & Wastewater District	20737	Everett Intertie	8/7/2013	<0.07
WA5357550	Mukilteo Water & Wastewater District	20737	Everett Intertie	11/14/2013	<0.07
WA5357550	Mukilteo Water & Wastewater District	20737	Everett Intertie	2/14/2014	<0.07
WA5357550	Mukilteo Water & Wastewater District	20737	Everett Intertie	5/20/2014	<0.07
WA5303420	Naval Air Station - Whidbey Island	1	Oak Harbor Intertie	2/11/2014	<0.07
WA5303420	Naval Air Station - Whidbey Island	1	Oak Harbor Intertie	5/6/2014	<0.07
WA5303420	Naval Air Station - Whidbey Island	1	Oak Harbor Intertie	8/19/2014	<0.07
WA5303420	Naval Air Station - Whidbey Island	1	Oak Harbor Intertie	11/4/2014	<0.07
WA5302714	Naval Base Kitsap @ Bangor	70090	70009 Chlorination Station	3/12/2014	<0.07
WA5302714	Naval Base Kitsap @ Bangor	70090	70009 Chlorination Station	9/17/2014	<0.07
WA5302714	Naval Base Kitsap @ Bangor	70510	7051 Chlorination Station	3/12/2014	<0.07
WA5302714	Naval Base Kitsap @ Bangor	70510	7051 Chlorination Station	9/17/2014	<0.07
WA5303468	Naval Base Kitsap @ Bremerton	1	Bremerton Intertie	1/14/2014	<0.07
WA5303468	Naval Base Kitsap @ Bremerton	1	Bremerton Intertie	4/9/2014	<0.07
WA5303468	Naval Base Kitsap @ Bremerton	1	Bremerton Intertie	7/9/2014	<0.07
WA5303468	Naval Base Kitsap @ Bremerton	1	Bremerton Intertie	10/29/2014	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5359700	Nob Hill Water Association	1	Tieton Well	9/9/2014	<0.07
WA5359700	Nob Hill Water Association	1	Tieton Well	5/14/2015	<0.07
WA5359700	Nob Hill Water Association	2	Gilbert Well	4/21/2014	<0.07
WA5359700	Nob Hill Water Association	3	Hayes Well	4/21/2014	<0.07
WA5359700	Nob Hill Water Association	4	King St. Well	4/21/2014	<0.07
WA5359700	Nob Hill Water Association	7	Apple Blossom Well	9/9/2014	<0.07
WA5359700	Nob Hill Water Association	7	Apple Blossom Well	5/14/2015	<0.07
WA5305122	North Peninsula	3255	J Pt. 1	9/9/2013	<0.07
WA5305122	North Peninsula	3255	J Pt. 1	3/25/2014	<0.07
WA5305122	North Peninsula	3256	Wellfield (SO5 & SO6)	9/9/2013	<0.07
WA5305122	North Peninsula	3256	Wellfield (SO5 & SO6)	3/25/2014	<0.07
WA5305122	North Peninsula	3257	Gam 3 Ritter	9/9/2013	<0.07
WA5305122	North Peninsula	3257	Gam 3 Ritter	3/25/2014	<0.07
WA5305122	North Peninsula	3258	Kingston 7	3/25/2014	<0.07
WA5305122	North Peninsula	3258	Kingston 7	9/29/2015	<0.07
WA5360950	North Perry Avenue Water District	2	Pickering	5/22/2013	<0.07
WA5360950	North Perry Avenue Water District	2	Pickering	11/4/2013	<0.07
WA5360950	North Perry Avenue Water District	3	Perry Ave.	11/4/2013	<0.07
WA5360950	North Perry Avenue Water District	4	Gilberton #1	5/22/2013	<0.07
WA5360950	North Perry Avenue Water District	4	Gilberton #1	11/6/2013	<0.07
WA5360950	North Perry Avenue Water District	5	Gilberton #2	5/22/2013	<0.07
WA5360950	North Perry Avenue Water District	5	Gilberton #2	11/6/2013	<0.07
WA5360950	North Perry Avenue Water District	7	Sunset	5/20/2013	<0.07
WA5360950	North Perry Avenue Water District	7	Sunset	11/4/2013	<0.07
WA5360950	North Perry Avenue Water District	8	Bucklin Hill	5/21/2013	<0.07
WA5360950	North Perry Avenue Water District	8	Bucklin Hill	11/6/2013	<0.07
WA5360950	North Perry Avenue Water District	9	Center St. #2	5/20/2013	<0.07
WA5360950	North Perry Avenue Water District	9	Center St. #2	11/5/2013	<0.07
WA5360950	North Perry Avenue Water District	10	Riddell Rd.	5/20/2013	<0.07
WA5360950	North Perry Avenue Water District	10	Riddell Rd.	11/5/2013	<0.07
WA5360950	North Perry Avenue Water District	11	Meadowdale #2	5/21/2013	<0.07
WA5360950	North Perry Avenue Water District	11	Meadowdale #2	11/5/2013	<0.07
WA5360950	North Perry Avenue Water District	12	Well #14	5/21/2013	<0.07
WA5360950	North Perry Avenue Water District	12	Well #14	11/6/2013	<0.07
WA5340800	Northshore Utility District	17222	Seattle Intertie	5/19/2014	<0.07
WA5340800	Northshore Utility District	17222	Seattle Intertie	8/12/2014	<0.07
WA5340800	Northshore Utility District	17222	Seattle Intertie	2/11/2015	<0.07
WA5363008	Ocean Shores Water Department	2243	Water Treatment Facility	8/27/2014	<0.07
WA5363008	Ocean Shores Water Department	2243	Water Treatment Facility	2/4/2015	<0.07
WA5363600	Olympic View Water & Sewer District	1	Intertie from Seattle Water	7/14/2014	<0.07
WA5363600	Olympic View Water & Sewer District	1	Intertie from Seattle Water	10/27/2014	<0.07
WA5363600	Olympic View Water & Sewer District	1	Intertie from Seattle Water	1/13/2015	<0.07
WA5363600	Olympic View Water & Sewer District	4	Deer Creek	7/14/2014	<0.07
WA5363600	Olympic View Water & Sewer District	4	Deer Creek	10/27/2014	<0.07
WA5363600	Olympic View Water & Sewer District	4	Deer Creek	1/13/2015	<0.07
WA5363600	Olympic View Water & Sewer District	4	Deer Creek	4/15/2015	<0.07
WA5364850	Othello Water Department	90001	Well #2	1/21/2014	<0.07
WA5364850	Othello Water Department	90001	Well #2	7/14/2014	<0.07
WA5364850	Othello Water Department	90002	Well #3	1/21/2014	<0.07
WA5364850	Othello Water Department	90002	Well #3	7/14/2014	<0.07
WA5364850	Othello Water Department	90003	Well #4	2/18/2014	<0.07
WA5364850	Othello Water Department	90003	Well #4	7/14/2014	<0.07
WA5364850	Othello Water Department	90004	Well #5	1/21/2014	<0.07
WA5364850	Othello Water Department	90004	Well #5	7/14/2014	<0.07
WA5364850	Othello Water Department	90005	Well #6	2/18/2014	<0.07
WA5364850	Othello Water Department	90005	Well #6	7/14/2014	<0.07
WA5364850	Othello Water Department	90006	Well #7	1/21/2014	<0.07
WA5364850	Othello Water Department	90006	Well #7	7/14/2014	<0.07
WA5364850	Othello Water Department	90007	Well #8	1/21/2014	<0.07
WA5364850	Othello Water Department	90007	Well #8	7/14/2014	<0.07
WA5366200	Parkland Light & Water Company	1	Well #1	10/15/2013	<0.07
WA5366200	Parkland Light & Water Company	1	Well #1	4/3/2014	<0.07
WA5366200	Parkland Light & Water Company	5	Well #6	10/15/2013	<0.07
WA5366200	Parkland Light & Water Company	5	Well #6	4/7/2014	<0.07
WA5366200	Parkland Light & Water Company	7	Well #8	10/15/2013	<0.07
WA5366200	Parkland Light & Water Company	7	Well #8	4/3/2014	<0.07
WA5366200	Parkland Light & Water Company	11	Well #12	10/15/2013	<0.07
WA5366200	Parkland Light & Water Company	11	Well #12	4/7/2014	<0.07
WA5366200	Parkland Light & Water Company	14	Tank 2	10/14/2013	<0.07
WA5366200	Parkland Light & Water Company	14	Tank 2	4/1/2014	<0.07
WA5366200	Parkland Light & Water Company	15	Tank - 6	10/14/2013	<0.07
WA5366200	Parkland Light & Water Company	15	Tank - 6	4/3/2014	<0.07
WA5366200	Parkland Light & Water Company	16	CT - Main	4/3/2014	<0.07
WA5366200	Parkland Light & Water Company	16	CT - Main	10/2/2014	<0.07
WA5366400	Pasco Water Department	1	Columbia River	2/13/2013	<0.07
WA5366400	Pasco Water Department	1	Columbia River	5/15/2013	<0.07
WA5366400	Pasco Water Department	1	Columbia River	8/13/2013	<0.07
WA5366400	Pasco Water Department	1	Columbia River	11/12/2013	<0.07
WA5366400	Pasco Water Department	2	Columbia River S-09	2/13/2013	<0.07
WA5366400	Pasco Water Department	2	Columbia River S-09	5/15/2013	<0.07
WA5366400	Pasco Water Department	2	Columbia River S-09	8/13/2013	<0.07
WA5366400	Pasco Water Department	2	Columbia River S-09	11/12/2013	<0.07
WA5303182	Port of Seattle - Seatac Airport	3558	Seattle Intertie	2/4/2015	<0.07
WA5303182	Port of Seattle - Seatac Airport	3558	Seattle Intertie	5/7/2015	<0.07
WA5303182	Port of Seattle - Seatac Airport	3558	Seattle Intertie	8/6/2015	<0.07
WA5303182	Port of Seattle - Seatac Airport	3558	Seattle Intertie	11/10/2015	<0.07
WA5368900	Port Orchard Water Department	2271	Well #6	1/26/2015	<0.07
WA5368900	Port Orchard Water Department	2272	Wells #4 & #7	1/26/2015	<0.07
WA5368900	Port Orchard Water Department	2272	Wells #4 & #7	7/6/2015	<0.07
WA5368900	Port Orchard Water Department	2273	Well #8	1/26/2015	<0.07
WA5368900	Port Orchard Water Department	2273	Well #8	7/6/2015	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5368900	Port Orchard Water Department	2274	Well #9	1/26/2015	<0.07
WA5368900	Port Orchard Water Department	2274	Well #9	7/6/2015	<0.07
WA5368900	Port Orchard Water Department	22688	Bremerton Intertie	1/28/2015	<0.07
WA5368900	Port Orchard Water Department	22688	Bremerton Intertie	4/6/2015	<0.07
WA5368900	Port Orchard Water Department	22688	Bremerton Intertie	7/6/2015	<0.07
WA5368900	Port Orchard Water Department	22688	Bremerton Intertie	11/24/2015	<0.07
WA5393343	PUD #1 of Asotin County	3	Well #3	1/14/2014	<0.07
WA5393343	PUD #1 of Asotin County	3	Well #3	7/24/2014	<0.07
WA5393343	PUD #1 of Asotin County	6	Well #6	1/14/2014	<0.07
WA5393343	PUD #1 of Asotin County	6	Well #6	7/24/2014	<0.07
WA5393343	PUD #1 of Asotin County	7	Well #7	1/14/2014	<0.07
WA5393343	PUD #1 of Asotin County	7	Well #7	7/24/2014	<0.07
WA5303456	Ridge Water Association	90001	Ridge Well #1	5/27/2014	<0.07
WA5303456	Ridge Water Association	90001	Ridge Well #1	12/3/2014	<0.07
WA5303456	Ridge Water Association	90002	Ridge Well #2	5/27/2014	<0.07
WA5303456	Ridge Water Association	90002	Ridge Well #2	12/3/2014	<0.07
WA5374700	Royal City Water	90001	Well #1	4/9/2013	<0.07
WA5374700	Royal City Water	90001	Well #1	8/20/2013	<0.07
WA5374700	Royal City Water	90002	Well #3	4/10/2013	<0.07
WA5374700	Royal City Water	90002	Well #3	8/20/2013	<0.07
WA5374700	Royal City Water	90003	Well #4	4/10/2013	<0.07
WA5374700	Royal City Water	90003	Well #4	8/20/2013	<0.07
WA5340900	Sammamish Plateau Water & Sewer	1	Well #1	3/30/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	1	Well #1	9/3/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	7	Corrosion Control Facility	3/30/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	7	Corrosion Control Facility	9/3/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	8	Well #12	3/31/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	8	Well #12	9/30/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	9	Well #13	3/31/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	9	Well #13	5/16/2016	<0.07
WA5340900	Sammamish Plateau Water & Sewer	11	Well #10	3/30/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	11	Well #10	9/3/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	12	Main Street Treatment Facility	3/31/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	12	Main Street Treatment Facility	9/3/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	18	Wells #2.1 & #2.2	3/30/2015	<0.07
WA5340900	Sammamish Plateau Water & Sewer	18	Wells #2.1 & #2.2	9/3/2015	<0.07
WA5376530	Scenic Shores Water Company	90001	S01	2/18/2014	<0.07
WA5376530	Scenic Shores Water Company	90001	S01	8/18/2014	<0.07
WA5376530	Scenic Shores Water Company	90002	S02	2/18/2014	<0.07
WA5376530	Scenic Shores Water Company	90002	S02	8/18/2014	<0.07
WA5376530	Scenic Shores Water Company	90003	S03	2/18/2014	<0.07
WA5376530	Scenic Shores Water Company	90003	S03	8/18/2014	<0.07
WA5377050	Seattle Public Utilities	1	Cedar Water Treatment Facility	1/13/2015	<0.07
WA5377050	Seattle Public Utilities	1	Cedar Water Treatment Facility	4/6/2015	<0.07
WA5377050	Seattle Public Utilities	1	Cedar Water Treatment Facility	7/22/2015	<0.07
WA5377050	Seattle Public Utilities	1	Cedar Water Treatment Facility	10/13/2015	<0.07
WA5377050	Seattle Public Utilities	2	Tolt Treatment Facility	1/13/2015	<0.07
WA5377050	Seattle Public Utilities	2	Tolt Treatment Facility	4/6/2015	<0.07
WA5377050	Seattle Public Utilities	2	Tolt Treatment Facility	7/22/2015	<0.07
WA5377050	Seattle Public Utilities	2	Tolt Treatment Facility	10/13/2015	<0.07
WA5339600	Shoreline Water District	17067	Seattle Intertie - Supply Station 4	4/15/2013	<0.07
WA5339600	Shoreline Water District	17067	Seattle Intertie - Supply Station 4	7/16/2013	<0.07
WA5339600	Shoreline Water District	17067	Seattle Intertie - Supply Station 4	1/16/2014	<0.07
WA5339600	Shoreline Water District	17067	Seattle Intertie - Supply Station 4	6/3/2015	<0.07
WA5379250	Silver Lake Water & Sewer District	23859	Everett Intertie	3/17/2015	<0.07
WA5379250	Silver Lake Water & Sewer District	23859	Everett Intertie	5/13/2015	<0.07
WA5379250	Silver Lake Water & Sewer District	23859	Everett Intertie	8/11/2015	<0.07
WA5379250	Silver Lake Water & Sewer District	23859	Everett Intertie	11/19/2015	<0.07
WA5379250	Silver Lake Water & Sewer District	23860	Clearview Intertie	3/17/2015	<0.07
WA5379250	Silver Lake Water & Sewer District	23860	Clearview Intertie	5/13/2015	<0.07
WA5379250	Silver Lake Water & Sewer District	23860	Clearview Intertie	8/11/2015	<0.07
WA5379250	Silver Lake Water & Sewer District	23860	Clearview Intertie	11/19/2015	<0.07
WA5379300	Silverdale Water District #16	1	Provost Rd. Well	12/9/2014	<0.07
WA5379300	Silverdale Water District #16	1	Provost Rd. Well	6/17/2015	<0.07
WA5379300	Silverdale Water District #16	4	Bucklin Ridge	12/10/2014	<0.07
WA5379300	Silverdale Water District #16	4	Bucklin Ridge	6/17/2015	<0.07
WA5379300	Silverdale Water District #16	7	Spirit Ridge #3	12/8/2014	<0.07
WA5379300	Silverdale Water District #16	7	Spirit Ridge #3	6/17/2015	<0.07
WA5379300	Silverdale Water District #16	8	Island Lake Well	12/9/2014	<0.07
WA5379300	Silverdale Water District #16	8	Island Lake Well	6/17/2015	<0.07
WA5379300	Silverdale Water District #16	10	Spirit Ridge Well #4	12/9/2014	<0.07
WA5379300	Silverdale Water District #16	10	Spirit Ridge Well #4	6/16/2015	<0.07
WA5379300	Silverdale Water District #16	11	Hess Well	12/8/2014	<0.07
WA5379300	Silverdale Water District #16	11	Hess Well	6/16/2015	<0.07
WA5379300	Silverdale Water District #16	12	Wixson Well	12/8/2014	<0.07
WA5379300	Silverdale Water District #16	12	Wixson Well	6/16/2015	<0.07
WA5379300	Silverdale Water District #16	13	Westwind Well	12/8/2014	<0.07
WA5379300	Silverdale Water District #16	13	Westwind Well	6/16/2015	<0.07
WA5379300	Silverdale Water District #16	15	Dawn Park Well	12/8/2014	<0.07
WA5379300	Silverdale Water District #16	15	Dawn Park Well	6/17/2015	<0.07
WA5379300	Silverdale Water District #16	16	El Dorado Well	12/8/2014	<0.07
WA5379300	Silverdale Water District #16	16	El Dorado Well	6/16/2015	<0.07
WA5379300	Silverdale Water District #16	19	Ridgetop #2	12/10/2014	<0.07
WA5379300	Silverdale Water District #16	19	Ridgetop #2	6/17/2015	<0.07
WA5379500	Skagit County PUD #1 - Judy Res.	1	Judy Reservoir	8/25/2014	<0.07
WA5379500	Skagit County PUD #1 - Judy Res.	1	Judy Reservoir	11/19/2014	<0.07
WA5379500	Skagit County PUD #1 - Judy Res.	1	Judy Reservoir	2/2/2015	<0.07
WA5379500	Skagit County PUD #1 - Judy Res.	1	Judy Reservoir	5/4/2015	<0.07
WA5380907	Snohomish Co. PUD #1 - Lake Stevens	24039	Everett Intertie	1/22/2014	<0.07
WA5380907	Snohomish Co. PUD #1 - Lake Stevens	24039	Everett Intertie	4/15/2014	<0.07
WA5380907	Snohomish Co. PUD #1 - Lake Stevens	24039	Everett Intertie	7/22/2014	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5380907	Snohomish Co. PUD #1 - Lake Stevens	24039	Everett Intertie	10/27/2014	<0.07
WA5380907	Snohomish Co. PUD #1 - Lake Stevens	24043	Lake Stevens Well #1	4/16/2014	<0.07
WA5380907	Snohomish Co. PUD #1 - Lake Stevens	24043	Lake Stevens Well #1	10/28/2014	<0.07
WA5381080	Snoqualmie Water	2458	Canyon Springs	3/26/2013	<0.07
WA5381080	Snoqualmie Water	2458	Canyon Springs	9/17/2013	<0.07
WA5381080	Snoqualmie Water	3788	North Wellfield Treatment Plant	3/26/2013	<0.07
WA5381080	Snoqualmie Water	3788	North Wellfield Treatment Plant	9/17/2013	<0.07
WA5381080	Snoqualmie Water	4134	South Wellfield Treatment Plant	3/26/2013	<0.07
WA5381080	Snoqualmie Water	4134	South Wellfield Treatment Plant	9/17/2013	<0.07
WA5340100	Soos Creek Water & Sewer District	17151	Seattle Intertie	3/12/2013	<0.07
WA5340100	Soos Creek Water & Sewer District	17151	Seattle Intertie	6/12/2013	<0.07
WA5340100	Soos Creek Water & Sewer District	17151	Seattle Intertie	9/5/2013	<0.07
WA5340100	Soos Creek Water & Sewer District	17151	Seattle Intertie	12/23/2013	<0.07
WA5381500	South Bend Water Department	90001	Treatment Plant	1/21/2015	<0.07
WA5381500	South Bend Water Department	90001	Treatment Plant	4/20/2015	<0.07
WA5381500	South Bend Water Department	90001	Treatment Plant	7/21/2015	<0.07
WA5381500	South Bend Water Department	90001	Treatment Plant	10/20/2015	<0.07
WA5382844	Southwood Water System	1	Well #1	8/11/2014	<0.07
WA5382844	Southwood Water System	1	Well #1	2/23/2015	<0.07
WA5382844	Southwood Water System	2	Bethel Ridge	8/11/2014	<0.07
WA5382844	Southwood Water System	2	Bethel Ridge	2/12/2015	<0.07
WA5382844	Southwood Water System	9	Lauradel A,B	3/16/2015	<0.07
WA5382844	Southwood Water System	11	Quiet Village 2	8/13/2014	<0.07
WA5382844	Southwood Water System	11	Quiet Village 2	3/16/2015	<0.07
WA5382844	Southwood Water System	12	Fir Meadows A,B	8/13/2014	<0.07
WA5382844	Southwood Water System	12	Fir Meadows A,B	2/16/2015	<0.07
WA5382844	Southwood Water System	14	Moreyglen A,B	8/12/2014	<0.07
WA5382844	Southwood Water System	14	Moreyglen A,B	2/16/2015	<0.07
WA5382844	Southwood Water System	15	Oak Hill Estates	8/11/2014	<0.07
WA5382844	Southwood Water System	15	Oak Hill Estates	2/16/2015	<0.07
WA5382844	Southwood Water System	16	Beverly Park A,B	10/21/2014	<0.07
WA5382844	Southwood Water System	16	Beverly Park A,B	2/25/2015	0.073
WA5382844	Southwood Water System	18	Country Park 2	8/12/2014	<0.07
WA5382844	Southwood Water System	18	Country Park 2	2/23/2015	<0.07
WA5382844	Southwood Water System	29687	Tacoma Intertie	8/12/2014	<0.07
WA5382844	Southwood Water System	29687	Tacoma Intertie	11/1/2014	<0.07
WA5382844	Southwood Water System	29687	Tacoma Intertie	2/23/2015	<0.07
WA5382850	Spanaway Water Company	1	Well #1	4/15/2014	<0.07
WA5382850	Spanaway Water Company	1	Well #1	10/6/2014	<0.07
WA5382850	Spanaway Water Company	3	Well #3	4/21/2014	<0.07
WA5382850	Spanaway Water Company	3	Well #3	10/7/2014	<0.07
WA5382850	Spanaway Water Company	4	Well #5	4/15/2014	<0.07
WA5382850	Spanaway Water Company	4	Well #5	10/7/2014	<0.07
WA5382850	Spanaway Water Company	5	Well #7	4/21/2014	<0.07
WA5382850	Spanaway Water Company	5	Well #7	10/6/2014	<0.07
WA5382850	Spanaway Water Company	7	Well #8	4/21/2014	<0.07
WA5382850	Spanaway Water Company	7	Well #8	10/6/2014	<0.07
WA5382850	Spanaway Water Company	8	Well #9	4/29/2014	<0.07
WA5382850	Spanaway Water Company	8	Well #9	10/7/2014	<0.07
WA5382850	Spanaway Water Company	12	Well #2 (Shaffer)	4/21/2014	<0.07
WA5382850	Spanaway Water Company	12	Well #2 (Shaffer)	10/6/2014	<0.07
WA5382850	Spanaway Water Company	13	Wellfield 2, 2A	4/15/2014	<0.07
WA5382850	Spanaway Water Company	13	Wellfield 2, 2A	10/6/2014	<0.07
WA5382850	Spanaway Water Company	14	Well #4	4/21/2014	<0.07
WA5382850	Spanaway Water Company	14	Well #4	10/6/2014	<0.07
WA5393351	Spokane County Water District #3, System #2	3963	26/Verc. 2-5	4/6/2015	<0.07
WA5393351	Spokane County Water District #3, System #2	3963	26/Verc. 2-5	10/20/2015	<0.07
WA5393351	Spokane County Water District #3, System #2	3964	Brns. Pk. 2-6	5/13/2015	<0.07
WA5393351	Spokane County Water District #3, System #2	3965	WF/ S14, S15	5/13/2015	<0.07
WA5393351	Spokane County Water District #3, System #2	3965	WF/ S14, S15	10/20/2015	<0.07
WA5385050	Summit Water & Supply Company	2	Wells #4 & #8	4/22/2013	<0.07
WA5385050	Summit Water & Supply Company	2	Wells #4 & #8	10/29/2013	<0.07
WA5385050	Summit Water & Supply Company	3	Wells #5 & #7	4/22/2013	<0.07
WA5385050	Summit Water & Supply Company	3	Wells #5 & #7	10/29/2013	<0.07
WA5385050	Summit Water & Supply Company	5	Well #10	4/22/2013	<0.07
WA5385050	Summit Water & Supply Company	5	Well #10	10/29/2013	<0.07
WA5387116	Tahuyeh Lake Community Club	90001	Pumphouse	1/16/2013	<0.07
WA5387116	Tahuyeh Lake Community Club	90001	Pumphouse	7/23/2013	<0.07
WA5390260	Union Hill Water Association, Inc.	90001	Well #1	3/3/2014	<0.07
WA5390260	Union Hill Water Association, Inc.	90001	Well #1	9/9/2014	<0.07
WA5390260	Union Hill Water Association, Inc.	90002	Well #1S	3/3/2014	<0.07
WA5390260	Union Hill Water Association, Inc.	90002	Well #1S	9/9/2014	<0.07
WA5391450	Vera Water & Power	1	Well 1	7/13/2015	<0.07
WA5391450	Vera Water & Power	3	Well 3	7/13/2015	<0.07
WA5391450	Vera Water & Power	4	Well 4	7/13/2015	<0.07
WA5391450	Vera Water & Power	6	Well 6	7/13/2015	<0.07
WA5391450	Vera Water & Power	12	WF/Well 2A(S10,11)	7/13/2015	<0.07
WA5391450	Vera Water & Power	13	Well 33	7/13/2015	<0.07
WA5392500	Walla Walla Water Division	1	Mill Creek Water Shed	6/17/2014	<0.07
WA5392500	Walla Walla Water Division	1	Mill Creek Water Shed	9/29/2014	<0.07
WA5392500	Walla Walla Water Division	1	Mill Creek Water Shed	12/9/2014	<0.07
WA5392500	Walla Walla Water Division	1	Mill Creek Water Shed	4/7/2015	<0.07
WA5393063	Washington Corrections Center	90001	500K Gallon Tank	6/2/2015	<0.07
WA5393063	Washington Corrections Center	90001	500K Gallon Tank	12/9/2015	<0.07
WA5393200	Washington State University	3038	Well #7	3/11/2015	<0.07
WA5393200	Washington State University	3038	Well #7	9/15/2015	<0.07
WA5393200	Washington State University	3041	Well #6	3/11/2015	<0.07
WA5393200	Washington State University	3041	Well #6	9/15/2015	<0.07
WA5393200	Washington State University	3042	Well #8	3/11/2015	<0.07
WA5393200	Washington State University	3042	Well #8	9/15/2015	<0.07
WA5393200	Washington State University	25700	Well #4	3/11/2015	<0.07

Table 4. UCMR 3 1,4-Dioxane Testing Data for Washington Group A Water Supply Wells

PWS ID	PWS Name	Facility ID	Facility Name	Collection Date	1,4-Dioxane (µg/L)
WA5393200	Washington State University	25700	Well #4	9/15/2015	<0.07
WA5302600	West Sound Utility District #1	6	Village Greens #8	9/23/2014	<0.07
WA5302600	West Sound Utility District #1	6	Village Greens #8	3/17/2015	<0.07
WA5302600	West Sound Utility District #1	14	Village Greens #2	9/23/2014	<0.07
WA5302600	West Sound Utility District #1	14	Village Greens #2	3/17/2015	<0.07
WA5302600	West Sound Utility District #1	16	Well #18	9/22/2014	<0.07
WA5302600	West Sound Utility District #1	16	Well #18	3/17/2015	<0.07
WA5302600	West Sound Utility District #1	17	Well #19	9/24/2014	<0.07
WA5302600	West Sound Utility District #1	17	Well #19	3/18/2015	<0.07
WA5302600	West Sound Utility District #1	18	Well #20	9/23/2014	<0.07
WA5302600	West Sound Utility District #1	18	Well #20	3/16/2015	<0.07
WA5302600	West Sound Utility District #1	20	Krista Firs	9/22/2014	<0.07
WA5302600	West Sound Utility District #1	20	Krista Firs	3/16/2015	<0.07
WA5302600	West Sound Utility District #1	102	Well #1 & Well #5 Blended	9/22/2014	<0.07
WA5302600	West Sound Utility District #1	102	Well #1 & Well #5 Blended	3/16/2015	<0.07
WA5302600	West Sound Utility District #1	515	Well #16 & Well #17 Blended	9/23/2014	<0.07
WA5302600	West Sound Utility District #1	515	Well #16 & Well #17 Blended	3/18/2015	<0.07
WA5302600	West Sound Utility District #1	919	Wells #11, #14 & #21	9/22/2014	<0.07
WA5302600	West Sound Utility District #1	919	Wells #11, #14 & #21	3/16/2015	<0.07
WA5396601	Whitworth Water District #2	1	Well 1	7/16/2014	<0.07
WA5396601	Whitworth Water District #2	1	Well 1	1/12/2015	<0.07
WA5396601	Whitworth Water District #2	2	Well 1A	7/15/2014	<0.07
WA5396601	Whitworth Water District #2	2	Well 1A	1/13/2015	<0.07
WA5396601	Whitworth Water District #2	5	Well 2A	7/15/2014	<0.07
WA5396601	Whitworth Water District #2	5	Well 2A	1/12/2015	<0.07
WA5396601	Whitworth Water District #2	7	Well 3	7/15/2014	<0.07
WA5396601	Whitworth Water District #2	7	Well 3	1/12/2015	<0.07
WA5396601	Whitworth Water District #2	15	Well 8	7/16/2014	<0.07
WA5396601	Whitworth Water District #2	15	Well 8	1/12/2015	<0.07
WA5396601	Whitworth Water District #2	17	Well 8A2	7/15/2014	<0.07
WA5396601	Whitworth Water District #2	17	Well 8A2	1/12/2015	<0.07
WA5396601	Whitworth Water District #2	29	Well 3C	7/16/2014	<0.07
WA5396601	Whitworth Water District #2	29	Well 3C	1/13/2015	<0.07
WA5341600	Woodinville Water District	17319	Seattle Intertie	12/3/2014	<0.07
WA5341600	Woodinville Water District	17319	Seattle Intertie	3/3/2015	<0.07
WA5341600	Woodinville Water District	17319	Seattle Intertie	6/1/2015	<0.07
WA5341600	Woodinville Water District	17319	Seattle Intertie	9/9/2015	<0.07

Note: Light gray font was used for all rows with a non-detect value

Source: U.S. Environmental Protection Agency (EPA). 2017b.– UCMR 3 (2013 – 2015) Occurrence Data, available online at https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3

UCMR3 source data presented in the table accessed on 10/18/2018

Table 5. Confirmed or Suspected Solvent Use/Release Sites Surrounding the Midway Landfill

Site Name	Address	Contamination Notes	CSCSL?	ECY SITE ID	FS ID
Northwest Powder Coatings	24453 Pacific Hwy S	Halogenated organics in soil, suspected in groundwater	Yes	1887	2332
Hauser Property	S 244th & 26th Pl S	Halogenated organics suspected in soil and groundwater	Yes	2778	2413
Japanese Auto Sales and Service	24141 Pacific Hwy S	Halogenated organics suspected in soil and groundwater	Yes	3577	8233705
Midway Cleaners	23647 Pacific Hwy S	Halogenated organics in soil, suspected in groundwater (appears present in gw)	Yes	517	91733269
Cleaners 1	26612 Pacific Hwy S	Halogenated organics in soil and groundwater	Yes	2326	29843481
Floyd R Hunt	3219 S 259th Place	Halogenated organics in soil	NFA	1945	2241
Davis Construction	24515 26th Place S	Halogenated organics suspected in soil and groundwater	NFA	1161	2237
Redondo 1 Hour	27203 Pacific Hwy S	Historical dry cleaner (? - 1994)	No	N/A	N/A
Midway Classic Cleaners	24860 Pacific Hwy S	Historical dry cleaner	No	N/A	N/A
Cho Kee	24453 Pacific Hwy S	Historical dry cleaner (2002 - 2008)	No	N/A	N/A
SeaTac Transmission Repair	24805 Pacific Hwy S	Historical auto repair (1977 - 2014)	No	N/A	N/A
Skips Auto Rebuild	24441 Pacific Hwy S	Historical auto repair (1974 - 1996)	No	N/A	N/A
Cape Cruiser Boat Works	25028 Pacific Hwy S	Historical boat repair (1987 - 2000)	No	N/A	N/A
RS Color & Design / Abra Auto Body	25015 Pacific Hwy S	Historical Auto repair (1988 - 2013)	No	N/A	N/A
Scooters Performance / Bow Wow	24811 Pacific Hwy S	Historical Auto repair (1992 - 2008)	No	N/A	N/A
American Tire & Equipment	24401 Pacific Hwy S	Historical auto repair (1971 - 1978)	No	N/A	N/A
WA National Guard	24410 Military Rd	National Guard Maintenance Shop	Yes	8721, 8722, 4652	32645977
Midway Muffler & Radiator	23898 Pacific Hwy S	Historical Auto repair (? - 1996)	No	N/A	N/A
Production Plastics Inc.	24602 Pacific Hwy S	Historical plastic manufacturer (1968 - ?)	No	N/A	N/A
Busy Bee Dry Cleaners	25246 Pacific Hwy S	Current Dry Cleaner	No	N/A	N/A

Notes: CSCSL = Confirmed and Suspected Contaminated Sites List

NFA = Ecology No Further Action Determination

N/A = Not Available, site not listed by Ecology

Sources: EDR (2017)

Washington State Department of Ecology (Ecology) – Cleanup Site Search, available online at https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx

Kroll Map Company, Inc, 1966-1974, Atlas of Seattle, Scale 1:200

Table 6. Updated Water Well Inventory within Approximate 1-Mile Radius of Midway Landfill

Well ID (T/R/S QQ)	Map ID	North	East	Owner	Address	Well Depth	Surf. Elev.	Screen Int.	Log?	Likely Aquifer [1]	Aquifer Basis	Source(s)[2]	WL Ft BGS	Use[3]	Source of Info	Notes	Operable?	Accessible	Well Type	Loc Quality[4]	Old Inventory #	Completion Elevation	Water Level Elevation
22N-04E-16L1	16L1	146556.297	1275906.250	Erickson	2060 20th Ave S	93	175	N/A	Y	NGA	Completion elev.	Imap, WSB 28, ECY, KCA	N/A	NIU	KCA	Redeveloped, on public water supply	Unlikely	No	Group D	I		82	N/A
22N-04E-16N1	16N1	144755.188	1274702.375	Highline WD Well 5	1826 S 240th St	146	150	124 - 145	Y	NGA	Completion elev.	Imap, WSB 28, ECY, KCA	-5 Flowing	NIU	DOH	Inactive	Unlikely	No	Group A	P	59	4	155
22N-04E-16R1	16R1	145086.500	1278561.375	Roland	23656 30th Ave S	275	400	N/A	N	SA	Completion elev.	Imap, WSB 28, KCA	131.45	NIU	KCA	On public water supply	Unlikely	No	Group D	I		125	268.55
22N-04E-21B1	21B1	144108.305	1276309.977	Shuck	24029 24th Ave S	65	312	N/A	N	UGA	Completion elev.	Imap, WSB 28, KCA	24.75	NIU	KCA	On public water supply	Unlikely	No	Group D	I		247	287.25
22N-04E-21B2	21B2	144341.462	1276521.116	Johnson	24004 24th Ave S	210	318	N/A	N	NGA	Completion elev.	Imap, WSB 28, KCA	N/A	NIU	KCA	On public water supply	Unlikely	No	Group D	I		108	N/A
22N-04E-21C1	21C1	143722.859	1275646.375	Stoner	24135 21st Ave S	36	225	N/A	N	SA	Completion elev.	Imap, WSB 28, MWI, GSV, KCA	8.72	NIU	MWI, GSV	On public water supply, well visible from street	Covered, but operable	Yes	Group D	I	11A	189	216.28
22N-04E-21C2	21C2	143827.829	1275266.964	Sahee	24131 21st Ave S	N/A	230	N/A	N	SA	Neighboring well	ECY WR, MWI, KCA	N/A	NIU	MWI	Decommissioned	No	No	Group D	P	11B	N/A	N/A
22N-04E-21C3	21C3	143709.686	12755366.100	Bjelland	24132 21st Ave S	N/A	240	N/A	N	SA	Neighboring well	ECY WR, KCA	N/A	NIU	KCA	On public water supply	Unlikely	No	Group D	P		N/A	N/A
22N-04E-21F1	21F1	142085.194	1275637.269	Marcus Whitman Church	2130 S 248th St	N/A	265	N/A	N	SA	Neighboring well	MWI, KCA	N/A	NIU	MWI, KCA	On public water supply	Covered, but operable	Yes	Group D	P	38	N/A	N/A
22N-04E-21G1	21G1	143407.371	1276326.907	Maynard	24319 24th Ave S	65	296	N/A	N	SA	Completion elev.	Imap, WSB 28, KCA	9.51	NIU	KCA	On public water supply	Unlikely	No	Group D	I		231	286.49
22N-04E-21K1	21K1	141240.328	1277408.455	Grohs	24860 Pacific Hwy S	200	370	N/A	N	SA	Completion elev.	MWI, KCA	N/A	NIU	MWI, KCA	On public water supply	Unlikely	No	Group D	P	37	170	N/A
22N-04E-21M1	21M1	141596.628	1273912.305	Wilson	24836 16th Ave S	257	210	N/A	N	DA	Completion elev.	Imap, ECY WR, KCA	N/A	NIU	KCA	On public water supply	Unlikely	No	Group D	I		-47	N/A
22N-04E-21N1	21N1	139943.540	1273836.397	Muller (Sasta)	25401 16th Pl. S.	125	195	N/A	N	SGA	Completion elev.	MWI, Imap, WSB 28, KCA	3	NIU	MWI	On public water supply	Decom.	No	Group D	P	12	70	192
22N-04E-21N2	21N2	140213.645	1273815.561	Smith	25276 16th Ave S	N/A	170	N/A	N	SGA	Neighboring well	MWI, KCA	N/A	NIU	MWI, Imap	Site is a stormwater pond	Decom.	No	Group D	P	55	N/A	N/A
22N-04E-21P1	**21P1**	**140325.224**	**1275733.010**	**Strange**	**25235 22nd Ave S**	**N/A**	**300**	**N/A**	**N**	**UGA**	**Wellhead elev.**	**MWI, KCA**	**N/A**	**PIU**	**MWI**	**On public water supply, well for irrigation**	**Likely**	**Yes**	**Group D - Irrigation**	**P**	**54**	**N/A**	**N/A**
22N-04E-22A1	22A1	143998.344	1282671.250	Unknown	4331 S 239th Pl	220	220	N/A	N	SGA	Completion elev.	Imap, KCA	N/A	NIU	KCA	On public water supply	Unlikely	No	Group D	I		0	N/A
22N-04E-22A2	**22A2**	**143740.919**	**1283743.306**	**Stearns**	**24519 Frager Rd S**	**65**	**40**	**55 - 60**	**Y**	**AA**	**Completion elev.**	**ECY, Imap, KCA**	**13**	**PIU**	**GSV, KCA**	**New well, on private water supply, site vacant**	**New well**	**Yes**	**Group D**	**A**		-25	27
22N-04E-22B1	22B1	140520.969	1284258.875	Pierce	4821 S Kent Des Moines Rd	110	190	N/A	N	SGA	Completion elev.	Imap, WSB 28, KCA	95	NIU	KCA	On public water supply	Unlikely	No	Group D	I		80	95
22N-04E-22E1	22E1	141957.779	1279680.632	Kent Test well	3400 S 248th Street	402	385	N/A	N	DA	Completion elev.	Imap, MWI, KCA	N/A	NIU	MWI	Well is capped	Unlikely	No	Group A Test Well	P		-17	N/A
22N-04E-22H1	**22H1**	**142791.264**	**1283049.768**	**Eckland**	**24421 Frager Rd S**	**N/A**	**75**	**N/A**	**N**	**SGA**	**Wellhead elev.**	**ECY WR, KCA**	**N/A**	**IU**	**KCA**	**On private water supply**	**Yes**	**Yes**	**Group D**	**P**		**N/A**	**N/A**
22N-04E-22J1	22J1	141229.780	1284300.635	Kent Riverbend 1	2091 W Meeker St	451	45	425 - 455	Y	AA	Completion elev.	ECY, ECY WR, KCA	-6.6 Flowing	NIU	ECY WR	Inactive	Unlikely	No	Group A - Irrigation	G		-406	51.6
22N-04E-22J2	**22J2**	**141275.282**	**1284247.462**	**Kent Riverbend 1R**	**2091 W Meeker St**	**465**	**45**	**412 - 440**	**Y**	**AA**	**Completion elev.**	**ECY, ECY WR, KCA**	**Flowing**	**IU**	**ECY**	**New irrigation well for Golf Course**	**Yes**	**Yes**	**Group A - Irrigation**	**G**		-420	50
22N-04E-22Q1	**22Q1**	**139764.228**	**1282913.789**	**Riefschnider**	**4516 S 254th St**	**246**	**255**	**236 - 246**	**Y**	**SGA**	**Completion elev.**	**Imap, ECY, WSB 28, KCA**	**166**	**PIU**	**MWI, KCA**	**On public water supply, well for irrigation**	**Unknown**	**Yes**	**Group D - Irrigation**	**P**		9	89
22N-04E-22Q2	**22Q2**	**139546.245**	**1281948.238**	**Kraft**	**25410 42nd Place S (4436 Reith Rd)**	**180**	**285**	**N/A**	**N**	**SA**	**Completion elev.**	**Imap, WSB 28, MWI, KCA**	**50**	**PIU**	**MWI**	**On public water supply, well for irrigation**	**Unknown**	**Yes**	**Group D - Irrigation**	**G**	**13**	105	235
22N-04E-22Q3	**22Q3**	**139673.755**	**1282486.954**	**Book**	**4343 S 254th St**	**N/A**	**260**	**N/A**	**N**	**SA**	**Neighboring well**	**GSV, KCA**	**N/A**	**PIU**	**GSV, KCA**	**On public water supply, well visible from street**	**Likely**	**Yes**	**Group D - Irrigation**	**P**		**N/A**	**N/A**

Table 6. Updated Water Well Inventory within Approximate 1-Mile Radius of Midway Landfill

Well ID (T/R/S QQ)	Map ID	North	East	Owner	Address	Well Depth	Surf. Elev.	Screen Int.	Log?	Likely Aquifer [1]	Aquifer Basis	Source(s)[2]	WL Ft BGS	Use[3]	Source of Info	Notes	Operable?	Accessible	Well Type	Loc Quality[4]	Old Inventory #	Completion Elevation	Water Level Elevation
22N-04E-27A3	27A3	138736.955	1283525.703	Huddleston	25643 Lk Fenwick Rd	120	200	N/A	N	SGA	Completion elev.	ECY WR, MWI, KCA	N/A	NIU	MWI, KCA	On public water supply, operable	Yes	Yes	Group D - Irrigation	P	15	80	N/A
22N-04E-27D1	27D1	138534.963	1279957.603	Moore	3420 S 259th Pl	40	400	N/A	N	UGA	Completion elev.	Imap, WSB 28, KCA	10.86	NIU	KCA	On public water supply	Unlikely	No	Group D - Irrigation	I		360	389.14
22N-04E-27E1	27E1	137060.188	1279717.750	Brannan	3422 S 262nd St	32	400	N/A	N	UGA	Completion elev.	Imap, WSB 28, KCA	N/A	NIU	KCA	On public water supply	Unlikely	No	Group D	I		368	N/A
22N-04E-27G1	27G1	137779.365	1281711.437	Dehnert	26010 42nd Ave S	129	300	N/A	N	SA	Completion elev.	Imap, WSB 28, KCA	119	NIU	KCA	On public water supply	Unlikely	No	Group D	I		171	181
22N-04E-27M1	27M1	136046.313	1279698.625	Kent Cambridge	3301 S 264th St	435	441.36	N/A	Y	SGA	Completion elev.	Imap, MWI, KCA, DNR	305	NIU	DNR	Well is capped	Unlikely	Yes	Group A - Test Well	P	58	6.36	136.36
22N-04E-28A1	28A1	138110.613	1278863.171	Guitar	3133 S 260th St	N/A	340	N/A	N	UGA	Wellhead elev.	MWI, KCA	N/A	NIU	MWI, KCA	On public water supply, well is capped	Unlikely	No	Group D	P	56	N/A	N/A
22N-04E-28B1	28B1	137687.245	1275770.807	Sides	26205 Pacific Hwy S	N/A	255	N/A	N	SA	Wellhead elev.	ECY WR, KCA	N/A	NIU	KCA	On public water supply	Unlikely	No	Group D	P		N/A	N/A
22N-04E-28D1	28D1	138739.029	1273914.134	Molitar	1605 S 257th Pl	27	250	N/A	N	SA	Completion elev.	Imap, WSB 28, KCA	3.17	NIU	KCA	On public water supply	Unlikely	No	Group D	I		223	246.83
22N-04E-28E1	28E1	137836.801	1274853.941	Jacobs	1847 S 260th	265	300	N/A	N	SGA	Completion elev.	Imap, WSB 28, MWI, KCA	56.89	NIU	MWI, KCA	On public water supply, pump removed	Unlikely	Yes	Group D	P	20	35	243.11
22N-04E-28G2	28G1	137412.516	1277109.500	Beattie	2600 S 260th St	50	250	N/A	N	SA	Completion elev.	Imap, WSB 28, ECY WR, KCA	3.4	NIU	KCA	On public water supply	Unlikely	No	Group D	I		200	246.6
22N-04E-28G3	28G3	137615.453	1277180.250	Highline WD Well 8	2600 S 260th St	242	280	204 - 221	Y	SGA	Completion elev.	Imap, ECY, ECY WR, DOH, WSB 28 MWI, KCA	38.5	NIU	MWI	Abandoned	Unlikely	No	Group A	P	60	38	241.5
22N-04E-28G4	28G4	137619.375	1276974.625	Highline WD	2600 S 260th St	24	260	N/A	N	SA	Completion elev.	Imap, ECY, ECY WR, DOH, WSB 28, KCA	N/A	NIU	DOH	Abandoned	Unlikely	No	Group A	I		236	N/A
22N-04E-28G5	28G5	137782.486	1276935.101	Highline WD Well 8M	2600 S 260th St	400	280	175 - 223	Y	DA	Completion elev.	ECY, ECY WR, DOH, KCA, HWD	48.2	NIU	HWD	Decommissioned	No	No	Group A	G		-120	231.8
22N-04E-28G6	28G6	137783.238	1277241.259	Rost	2635 S 260th	27	290	N/A	N	UGA	Completion elev.	WSB 28, MWI, KCA	9	NIU	MWI	On public water supply, well is operable	Yes	Yes	Group D	P	22	263	281
22N-04E-28L1	28L1	136358.895	1275183.738	Brown 1	26421 Pacific Hwy S	96	250	N/A	N	SA	Completion elev.	Imap, WSB 28, KCA	35	NIU	KCA	On public water supply	Unlikely	No	Group D	I		154	215
22N-04E-28L2	28L2	136358.895	1275183.738	Brown 2	26421 Pacific Hwy S	250	250	N/A	N	DA	Completion elev.	Imap, WSB 28, KCA	49.16	NIU	KCA	On public water supply	Unlikely	No	Group D	I		0	200.84
22N-04E-28L3	28L3	136384.532	1275644.977	Howard	26430 Pacific Hwy S	11	250	N/A	N	SA	Completion elev.	Imap, WSB 28, KCA	3.79	NIU	KCA	On public water supply	Unlikely	No	Group D	I		239	246.21
22N-04E-29A1	29A1	138867.849	1273625.438	Larson	25737 16th Ave S	96	200	N/A	N	SGA	Completion elev.	Imap, WSB 28, KCA	Dry	NIU	KCA	On public water supply	Unlikely	No	Group D	I		104	N/A
22N-04E-29A2	**29A2**	**138803.763**	**1273990.019**	**Meeker**	**1620 S 257th Place**	**27**	**280**	**N/A**	**N**	**UGA**	**Completion elev.**	**MWI, KCA**	**3**	**IU**	**MWI, KCA**	**On public water supply, used for lawn care**	**Yes**	**Yes**	**Group D - Irrigation**	**P**	**19**	**253**	**277**

Table 6. Updated Water Well Inventory within Approximate 1-Mile Radius of Midway Landfill

Well ID (T/R/S QQ)	Map ID	North	East	Owner	Address	Well Depth	Surf. Elev.	Screen Int.	Log?	Likely Aquifer [1]	Aquifer Basis	Source(s)[2]	WL Ft BGS	Use[3]	Source of Info	Notes	Operable?	Accessible	Well Type	Loc Quality[4]	Old Inventory #	Completion Elevation	Water Level Elevation

Notes:

[1]Likely Aquifer:

AA = Alluvial Aquifer
UGA = Upper Gravel Aquifer
SA = Sand Aquifer
NGA = Northern Gravel Aquifer
SGA = Southern Gravel Aquifer
DA = Deep Aquifer

[2]Sources:

ECY = Ecology Well Logs (Ecology 2019b)
ECY WR = Ecology Water Resources Explorer (Ecology 2019a)
WSB 28 = Water Supply Bulletin 28 (Luzier 1969)
Imap = King County iMAP groundwater well database
DOH = WA Department of Health (DOH 2019)
MWI = Midway Landfill Remedial Investigation Groundwater Technical Report, Appendix C, Water Well Inventory (Parametrix 1988b)
DNR = WA Dept. of Natural Resources Subsurface Database
GSV = Google(R) Street View (2019)
KCA = King County Assessor (2019)
HWD = Highline Water District

[3]Use:

NIU = Not in use
IU = In use
PIU = Potentially in use

[4]Location Quality:

P = Parcel
G = Google (R) Maps
I = Imap
A = Address matching

= In use or potentially in use wells
= Operable wells
N/A = Information Not Available

Table 7. In Use, Potentially in Use, and Operable Wells within Approximate 1-Mile Radius of Midway Landfill

Map ID	Owner	Address	Well Type	Likely Aquifer[1]	Use	Operable?	Source of Info[2]	Notes	Additional Notes
21C1	Stoner	24135 21st Ave S	Group D	SA	Not in use	Covered, but operable	MWI, GSV	On public water supply, well visible from street	House built in 1943, well SE of house
21F1	Marcus Whitman Church	2130 S 248th St	Group D	SA	Not in use	Covered, but operable	MWI, KCA	On public water supply	Church built in 1962, owned by Presbyterian of Seattle
21P1	Strange	25235 22nd Ave S	Group D - Irrigation	UGA	Potentially in use	Likely	MWI	On public water supply, well for irrigation	Two houses on large lot, built in 1943, well reported for irrigation in MWI
22A2	Stearns	24519 Frager Rd S	Group D	AA	Potentially in use	New well	GSV, KCA	New well, on private water supply, site vacant	Well drilled in 2016, site is currently vacant
22H1	Eckland	24421 Frager Rd S	Group D	SGA	In use	Yes	KCA	On private water supply	House built in 1931, well south of the residence
22J2	Kent Riverbend 1R	2091 W Meeker St	Group A - Irrigation	AA	In use	Yes	ECY	New irrigation well for Golf Course	New well drilled in 2016, Robinson Noble for City of Kent
22Q1	Riefschnider	4516 S 254th St	Group D - Irrigation	SGA	Potentially in use	Unknown	MWI, KCA	On public water supply, well for irrigation	House built in 1947, well potentially in use for irrigation
22Q2	Kraft	25410 42nd Place S (4436 Reith Rd)	Group D - Irrigation	SA	Potentially in use	Unknown	MWI	On public water supply, well for irrigation	New house built in 1995, well would be east of residence
22Q3	Book	4343 S 254th St	Group D - Irrigation	SA	Potentially in use	Likely	GSV, KCA	On public water supply, well visible from street	House built in 1959, well at north of residence next to driveway
27A3	Huddleston	25643 Lk Fenwick Rd	Group D - Irrigation	SGA	Not in use	Yes	MWI, KCA	On public water supply, operable	House built in 1959, well reported for irrigation in MWI
28G6	Rost	2635 S 260th	Group D	UGA	Not in use	Yes	MWI	On public water supply, well is operable	House appears demolished
29A2	Meeker	1620 S 257th Place	Group D - Irrigation	UGA	In use	Yes	MWI, KCA	On public water supply, used for lawn care	House built in 1948, well likely east of residence

Notes:

[1]Likely Aquifer:
AA = Alluvial Aquifer
UGA = Upper Gravel Aquifer
SA = Sand Aquifer
SGA = Southern Gravel Aquifer

[2]Source of Info
MWI = Midway Landfill Remedial Investigation Groundwater Technical Report, Appendix C, Water Well Inventory (Parametrix 1988b)
KCA = King County Assessor (2019)
GSV = Google(R) Street View (2019)
ECY = Ecology Well Logs (Ecology 2019b) or Ecology Water Resources Explorer (Ecology 2019a)

Table 8. Resource Protection Well Inventory within Approximate 1-Mile Radius of Midway Landfill

Ecy Well ID	Well ID (T/R/S QQ)	Map ID	North	East	Well Owner	Depth	# Wells	Well Comp Date	TaxParcel NR	Accuracy[1]
109805	R22N-04E-14N2	R14N2	147733.4089	1286508.137	PACIFIC PROPELLER		5	12/14/1994		P
	22N-04E-15X	R15X	146582.691	1280745.732	Kent Highlands NPL Site	100+	100+	77 - 17		QS
1020951	R22N-04E-15N1	R15N1	145653.504	1280794.549	Kent West LLC	15	9	4/2/2015	1522049053	P
1019248	R22N-04E-15N2	R15N2	145653.504	1280794.549	Mathews	21.5	6	3/30/2015		P
1064683	R22N-04E-15N3	R15N3	145238.816	1279513.977	WSDOT	80	1	8/31/2015		QS
1563158	R22N-04E-16R1	R16R1	144874.246	1278461.253	City Of Kent	101	2	1/12/2015		QS
589761	R22N-04E-16R2	R16R2	145314.2123	1278050.591	MIDWAY CLEANERS	24	18	4/23/2009		P
1637150	R22N-04E-16R3	R16R3	145263.696	1278260.033	Louis Gadini	14	2	5/24/2017	2500600520	P
1532499	R22N-04E-16R4	R16R4	145306.286	1277938.754	Michael Park	11	1	12/4/2015	2500600670	P
546961	R22N-04E-16R5	R16R5	144431.5158	1277662.628	SHANNON AND WILSON	22	3	6/23/2008		P
300372	R22N-04E-16R6	R16R6	144507.4694	1277888.447	UNOCAL (#6211) - DES MOINES		13			P
1570423	R22N-04E-16Q1	R16Q1	145102.555	1277142.034	Highline College	15	16	6/17/2016		P
339612	R22N-04E-16Q2	R16Q2	145968.8235	1278111.19	ENSR	40	3	8/19/2002		P
673650	R22N-04E-21A1	R21A1	144.252.63653	1277846.716	ARCO | ARCADIS	95	14	8/16/2010		P
200934	R22N-04E-21A2	R21A2	143046.6758	1277580.932	B & B AIRCRAFT		5			P
725444	R22N-04E-21A3	R21A3	143886.782	1277763.09	Centrum Financial Services | Allwest Testing & Eng.	8	12	4/11/2011	212204-9084	P
548848	R22N-04E-21A4	R21A4	143723.408	1278008.754	CITY OF KENT | EARTH CONSULTANTS INC	26.5	6	8/29/2008	N/A ROADWAY ROW	QS
390879	R22N-04E-21A5	R21A5	144050.8833	1278422.401	KENT DRIVE IN	70	1	8/18/2004		P
841433	R22N-04E-21A6	R21A6	143598.793	1277559.384	Sea Mar Community Health Center | Now Environmental Services	12	7	1/11/2013	3603000024	P
1514725	R22N-04E-21A7	R21A7	143251.7732	1277899.191	WIDING CONSTRUCTION	12	7	2/12/2016		P
1607250	R22N-04E-21B1	R21B1	144209.2816	1278960.186	Argus	65	2	6/28/2016		P
420716	R22N-04E-21B2	R21B2	144299.78	1277852.265	BP ARCO 4484	20	2	8/25/2005		P
1561222	R22N-04E-21B3	R21B3	143673.757	1277397.027	City Pacific Land Company	70	1	2/10/2016		QS
505551	R22N-04E-21B4	R21B4	142537.3377	1277501.972	GINSBERG | ENVIRONMENTAL RESOLUTIONS INC	20	3	9/14/2007		P
531419	R22N-04E-21G1	R21G1	142795.981	1277568.881	CHOC SOO CHUL	11	5	3/17/2008	3602400166	P
420712	R22N-04E-21G2	R21G2	143062.0145	1277249.499	VACANT LOT	40	1	8/12/2005		P
477654	R22N-04E-21D1	R21D1	144631.7844	1273878.661	PSE	210	1	11/15/2006		P
534640	R22N-04E-21F2	R21F2	142499.5051	1275553.571	HIGHLAND SCHOOL DISTRICT | ASSOCIATED EARTH SCIENCES	25	9	4/25/2008		P
411208	R22N-04E-21E1	R21E1	142407.8324	1275634.031	PARKSIDE ELEMENTARY		1	5/27/2005		P
1042660	R22N-04E-21J1	R21J1	140393.754	1277156.374	Cadence Capital	30	12	8/28/2015		P
349569	R22N-04E-21K1	R21K1	140447.446	1277214.181	EARTH CONSULTANTS	20	2	11/4/2002		P
855310	R22N-04E-21M2	R21M2	141091.328	1277040.801	Scott Hensrude	19	4	4/10/2013	2122049153	P
202473	R22N-04E-21Q1	R21Q1	139952.0952	1277221.951	FRED MEYER		7	3/8/1989		P
483700	R22N-04E-21Q2	R21Q2	140214.253	1276730.227	U-HAUL	50	12	5/17/2007		P
787513	R22N-04E-21Q3	R21Q3	139526.896	1276812.713	Wendys Restaurant | Leighton Consulting	10	19	3/28/2012	2122049201	P
603817	R22N-04E-21M1	R21M1	141335.429	1273787.588	City of Des Moines | Terracon	110	6	6/16/2009		P
1604322	R22N-04E-22A1	R22A1	143875.4957	1284105.504	Green River Soil Borings - FORMER NURSERY	20	15	12/20/2016		P
111114	R22N-04E-22F1	R21F1	141940.9515	1280544.221	AUTO BODY SHOP		1	6/5/1997		P
589603	R22N-04E-22F2	R22F2	142101.885	1281535.906	Federal Way School Dist | Associated Earth Sciences	50	8	5/5/2009		P
573403	R22N-04E-22F3	R22F3	141973.293	1280551.648	Jaswal Harpreet DR | Aerotech Consulting	19	6	2/17/2009	2222049010	P
331915	R22N-04E-22E1	R22E1	141914.9112	1280547.052	ENVIRONMENTAL RESOLUTIONS INC	25	4	4/3/2002		P
409100	R22N-04E-22E2	R22E2	142513.6671	1280547.057	FM GAS STATION	60	3	5/12/2005		P
1117527	R22N-04E-22R1	R22R1	140057.3393	1283631.537	Benjamin Ryan	35	1	11/5/2015		P
203008	R22N-04E-27C1	R27C1	138566.03	1281369.911	KENT FEILD		2			P
1561080	R22N-04E-28A1	R28A1	138240.313	1278164.009	City Of Kent	100	4	8/13/2015		QS
1561145	R22N-04E-28A2	R28A2	137941.3359	1277558.408	Gabrielle Dayrit - Pembrooke	100	2	12/3/2015		P
631697	R22N-04E-28A3	R28A3	138292.637	1278405.667	ORILLIA ROAD CROSSING	51.5	1			QS
106191	R22N-04E-28A4	R28A4	137953.249	1275705.683	PIERCE CO. LINE TO TUKWILA		1	12/20/1994		A
631694	R22N-04E-28A5	R28A5	137472.344	1278290.74	S 260TH CROSSING	50.5	2			P
1066466	R22N-04E-28A6	R28A6	149210.248	1284017.709	WSDOT	41	3	8/19/2015		QS
1538036	R22N-04E-28C1	R28C1	137825.575	1276111.048	Kim	12.5	5	2/5/2016	2822049156	P
310596	R22N-04E-28C2	R28C2	137520.0659	1276248.939	CLEANERS 1 CO	16	17	7/18/2000		P
571397	R22N-04E-28C3	R28C3	138303	1275946.672	Midway Chevron | Envitech	12	4	1/19/2009	2822049246	P
107237	R22N-04E-28C4	R28C4	138236.34	1275998.439	SHELL		7			P
620364	R22N-04E-28C5	R28C5	137903.251	1275864.673	Southland Corp | Stantec	12	8	11/10/2009	2822049219	P
525170	R22N-04E-28C6	R28C6	137343.4707	1276326.804	TIM JORVE	16	52	12/18/1998		P
1007492	R22N-04E-28D1	R28D1	137857.8054	1275881.956	Stantec Facility 18758 - 7-11 STORE	18	8	11/19/2014		P
321687	R22N-04E-28F1	R28F1	137822.3819	1276076.091	OHS MARKET	15	1	7/28/1997		P
1066464	R22N-04E-28J1	R28J1	147464.739	1283889.935	WSDOT	27	16	8/20/2015		QS
753224	R22N-04E-28K1	R28K1	136658.2657	1275390.191	Health Point | The Riley Group	10	7	9/19/2011		P
					TOTAL WELLS		396			

Notes: [1]Well Location Accuracy:

P = Parcel
A = Approximately
QS = Quarter/Quarter/Section

Table 9. Additional Water Wells Used for Flow Analysis within Approximate 2-Mile Radius of Midway Landfill

Well ID (T/R/S QQ)	Map ID	North	East	Owner	Address	Well Depth	Surf. Elev.	Screen Int.	Log?	Likely Aquifer [1]	Aquifer Basis	Source(s)[2]	WL Ft BGS	Well Type	Loc Quality[3]	Old Inventory #	Completion Elevation	Water Level Elevation
22-04E-17K1	**17K1**	**147738.568**	**1272794.525**	**Fisher**	**1213 S 230th St**	**630**	**100**	**N/A**	**N**	**DA**	**Completion elev.**	**Imap, WSB 28, KCA**	**N/A**	**Group D**	**P**		-530	N/A
22N-04E-17L1	17L1	147441.096	1270881.742	Kluth	23105 Marine View Drive S.	360	45	45	Y	DA	Completion elev.	WSB 28, KCA	7	Group D	G		-315	38
22N-04E-17Q1	17Q1	144774.657	1271911.065	Zenith Masonic Home	23660 Marine Vw Drive S.	1,001	162	896 - 919	Y	DA	Completion elev.	WSB 28, DOH, ECY WR, KCA	65	Group A	G		-839	97
22N-04E-20Q1	20Q1	140126.806	1271696.299	Saltwater State Park	25205 8th Place S	165	75	105 - 145	Y	DA	Completion elev.	WSB 28, KCA	N/A	Group D	G		-90	N/A
22N-04E-23D1	23D1	144154.031	1284879.200	Unknown (Orphan)	24202 Frager Rd S	NA	33	N/A	N	AA	Wellhead elev.	Imap, ECY, KCA	N/A	Group D	I		N/A	N/A
22N-04E-23N1	23N1	140837.057	1284727.931	Mazel	24931 Frager Rd S	N/A	40	N/A	N	AA	Wellhead elev.	ECY, ECY WR, KCA	N/A	Group D	P		N/A	N/A
22N-04E-23Q1	**23Q1**	**139160.582**	**1287173.103**	**Standard**	**25069 Frager Rd S**	**100**	**25**	**N/A**	**N**	**AA**	**Completion elev.**	**Imap, WSB 28, KCA**	**6**	**Group D - Irrigation**	**I**		**-75**	**19**
22N-04E-26H1	**26H1**	**136367.951**	**1290077.786**	**LoPriore**	**26404 68th Ave S**	**90**	**35**	**N/A**	**N**	**AA**	**Completion elev.**	**ECY WR, WSB 28, KCA**	**5.73**	**Group D - irrigation**	**P**		-55	29.27
22N-04E-27A1	27A1	138496.875	1284221.125	Flowers	25650 Lk Fenwick Rd	42	200	N/A	N	SA	Completion elev.	Imap, WSB 28, KCA	16.78	Group D	I		158	183.22
22N-04E-27A2	27A2	138698.750	1284155.500	Sandelius	25616 Lk Fenwick Rd	153	200	N/A	N	SGA	Completion elev.	Imap, WSB 28, MWI, KCA	121.15	Group D	I	16	47	78.85
22N-04E-27H1	**27H1**	**137054.650**	**1283306.533**	**Salter**	**26416 Lk Fenwick Rd S**	**39**	**140**	**39**	**Y**	**SGA**	**Completion elev.**	**ECY, MWI, KCA**	**17**	**Group D**	**P**	**2**	101	123
22N-04E-27H2	**27H2**	**135798.936**	**1284107.770**	**Hayett**	**26612 Lk Fenwick Rd S**	**84**	**165**	**75 - 83**	**Y**	**SGA**	**Completion elev.**	**ECY, ECY WR, DOH, MWI, KCA**	**43**	**Group B**	**P**	**5**	81	122
22N-04E-27J1	27J1	136217.780	1283659.340	Lake Fenwick supply	26425 Lk Fenwick Rd S (Sharick property)	165	300	N/A	N	SGA	Completion elev.	DOH, MWI, KCA	N/A	Group B	P	6	135	N/A
22N-04E-27J2	**27J2**	**136252.886**	**1284015.030**	**Heuston**	**26420 Lk Fenwick Rd**	**N/A**	**130**	**N/A**	**N**	**SGA**	**Neighboring well**	**ECY, ECY WR, DOH, KCA, PHSKC**	**N/A**	**Group B**	**P**		**N/A**	**N/A**
22N-04E-27J3	**27J3**	**136483.249**	**1283798.022**	**Unknown (Shannon)**	**26430 Lk Fenwick Rd**	**61**	**160**	**61**	**Y**	**SGA**	**Completion elev.**	**ECY, ECY WR, KCA**	**48**	**Group D**	**P**		99	112
22N-04E-27J4	27J4	135510.307	1284214.794	Flewellings (Banke)	26724 51st Pl S	30	130	30	N	SGA	Completion elev.	ECY, MWI, KCA	6	Group D	P	3	100	124
22N-04E-27J5	**27J5**	**135844.058**	**1283672.534**	**Sharick**	**26505 Lk Fenwick Rd S**	**137**	**200**	**137**	**Y**	**SGA**	**Completion elev.**	**ECY, MWI, KCA**	**79**	**Group D**	**P**	**1**	63	121
22N-04E-27J6	**27J6**	**136077.367**	**1284038.060**	**Sherman**	**26510 Lk Fenwick Rd S**	**N/A**	**160**	**N/A**	**N**	**SGA**	**Neighboring well**	**ECY WR, KCA**	**N/A**	**Group D**	**P**		**N/A**	**N/A**
22N-04E-27N1	27N1	134022.897	1280048.794	Star Lake Water Coop Well 2	3720 S 272nd St	345	375	335 - 345	Y	SGA	Completion elev.	ECY, ECY WR, WSB 28, KCA, HWD	235	Group A	G		30	140
22N-04E-27N2	27N2	134022.897	1280048.794	Star Lake Water Coop Well 3	3720 S 272nd St	366	375	343 - 366	Y	SGA	Completion elev.	ECY, ECY WR, WSB 28, KCA, HWD	229	Group A	G		9	146
22N-04E-27N3	27N3	134022.897	1280048.794	Star Lake Water Coop Well 1	3720 S 272nd St	142	375	122 - 135	Y	UGA	Completion elev.	ECY, ECY WR, WSB 28, KCA, HWD	60	Group A	G		240	315
22N-04E-27R1	27R1	135183.780	1284267.923	Fisher	26805 52nd Ave S	45	145	45	Y	SGA	Completion elev.	ECY, WSB 28, KCA	18	Group D	A		100	127
22N-04E-28L5	28L5	135862.959	1275063.775	Graham	26631 Pacific Hwy S	30	290	N/A	N	UGA	Completion elev.	ECY WR, MWI, KCA	N/A	Group D	P	26	260	N/A
22N-04E-28L6	28L6	135700.338	1275352.544	Hedin	26632 Pacific Hwy S	11	280	N/A	N	UGA	Completion elev.	MWI, KCA	4	Group D	P	28	269	276

Table 9. Additional Water Wells Used for Flow Analysis within Approximate 2-Mile Radius of Midway Landfill

Well ID (T/R/S QQ)	Map ID	North	East	Owner	Address	Well Depth	Surf. Elev.	Screen Int.	Log?	Likely Aquifer [1]	Aquifer Basis	Source(s)[2]	WL Ft BGS	Well Type	Loc Quality[3]	Old Inventory #	Completion Elevation	Water Level Elevation
22N-04E-28L7	28L7	136022.581	1275208.451	Wilcox	26601 Pacific Hwy S	96	290	N/A	N	SA	Completion elev.	MWI, KCA	35	Group D	P	25	194	255
22N-04E-28N1	28N1	135187.984	1274358.759	Bolinger	1805 S 268th St	N/A	310	N/A	N	SA	Neighboring well	ECY WR, KCA	N/A	Group D			N/A	N/A
22N-04E-28P1	28P1	134902.135	1275311.500	Highline WD Well 14	2600 S 260th St	342	272	145 - 165	Y	SGA	Completion elev.	Imap, ECY, ECY WR, DOH, WSB 28, MWI, KCA	15	Group A	G	61	107	257
22N-04E-29J1	29J1	135618.628	1273434.398	McGee	26645 16th Ave S	45	280	N/A	N	SA	Completion elev.	MWI, KCA	32	Group D	P	31A	235	248
22N-04E-29J2	29J2	136193.063	1272741.661	Waldron	1300 S 268th St	N/A	240	N/A	N	SA	Neighboring well	MWI, KCA	N/A	Group D	P	31B	N/A	N/A
22N-04E-29J3	29J3	135529.442	1273183.870	Sadler	1404 S 268th St	N/A	265	N/A	N	SA	Neighboring well	MWI, KCA, GSV	N/A	Group D	P	31C	N/A	N/A
22N-04E-29J4	**29J4**	**135827.978**	**1272822.935**	**Chester**	**1308 S 268th St**	**42**	**260**	**N/A**	**N**	**SA**	**Completion elev.**	**MWI, KCA**	**N/A**	**Group D - Irrigation**	**P**	**31D**	**218**	**N/A**
22N-04E-33C1	33C1	133891.071	1275110.354	LaVanaway	2211 S Star Lake Rd	182	273	182	Y	SGA	Completion elev.	WSB 28, KCA	14.52	Group D	Q		91	258.48
22N-04E-35A1	35A1	132418.036	1288956.543	Smith Brothers Well 1	27501 68th Ave S	210	35	N/A	N	AA	Completion elev.	Imap, WSB 28, ECY, ECY WR, DOH, KCA	N/A	Group A	P		-175	N/A
22N-04E-35A2	35A2	132632.703	1288963.158	Smith Brothers Well 2	27501 68th Ave S	217	35	N/A	N	AA	Completion elev.	Imap, WSB 28, ECY, ECY WR, DOH, KCA	N/A	Group A	P		-182	N/A
22N-04E-35D1	**35D1**	**132811.443**	**1285865.600**	**Smith (Stewart)**	**5516 S 277th St**	**N/A**	**40**	**N/A**	**N**	**AA**	**Wellhead elev.**	**Imap, ECY, ECY WR, KCA**	**N/A**	**Group D**	**P**		**N/A**	**N/A**
22N-04E-35E1	**35E 1**	**131959.694**	**1285566.165**	**Swanson**	**5460 Star Lake Rd**	**86**	**230**	**N/A**	**N**	**SA**	**Completion elev.**	**ECY, KCA**	**N/A**	**Group D**	**P**		**144**	**N/A**
22N-04E-35F1	35F1	131043.908	1286284.902	KCWD 64 Well 9	28030 55th Ave S	458	60	N/A	N	AA	Completion elev.	Imap, WSB 28, KCA, HWD	-10 Flowing	Group A	P		-398	N/A

Notes:

[1]Likely Aquifer:
- AA = Alluvial Aquifer
- UGA = Upper Gravel Aquifer
- SA = Sand Aquifer
- SGA = Southern Gravel Aquifer
- DA = Deep Aquifer

[2]Sources:
- ECY = Ecology Well Logs (Ecology 2019b)
- ECY WR = Ecology Water Resources Explorer (Ecology 2019a)
- WSB 28 = Water Supply Bulletin 28 (Luzier 1969)
- Imap = King County iMAP groundwater well database
- DOH = WA Department of Health (DOH 2019)
- MWI = Midway Landfill Remedial Investigation Groundwater Technical Report, Appendix C, Water Well Inventory (Parametrix 1988b)
- GSV = Google(R) Street View (2019)
- KCA = King County Assessor (2019)
- HWD = Highline Water District
- PHSKC = Public Health – Seattle & King County

[3]Location Quality:
- P = Parcel
- G = Google(R) maps
- Q = Quarter/Quarter
- I = Imap
- A = Address matching

= In use or potentially in use wells
= Operable wells
N/A = Information Not Available

Appendix A

EPA 1,4-Dioxane Technical Fact Sheet

United States Environmental Protection Agency

Technical Fact Sheet – 1,4-Dioxane

November 2017

TECHNICAL FACT SHEET – 1,4-DIOXANE

At a Glance

- Flammable liquid and a fire hazard. Potentially explosive if exposed to light or air.
- Found at many federal facilities because of its widespread use as a stabilizer in certain chlorinated solvents, paint strippers, greases and waxes.
- Short-lived in the atmosphere, may leach readily from soil to groundwater, migrates rapidly in groundwater and is relatively resistant to biodegradation in the subsurface.
- Classified by EPA as "likely to be carcinogenic to humans" by all routes of exposure.
- Short-term exposure may cause eye, nose and throat irritation; long-term exposure may cause kidney and liver damage.
- Federal screening levels, state health-based drinking water guidance values and federal occupational exposure limits have been established.
- Modifications to existing sample preparation procedures may be required to achieve the increased sensitivity needed for detection of 1,4-dioxane.
- Common treatment technologies include advanced oxidation processes and bioremediation.
- No federal maximum contaminant level (MCL) has been established for 1,4-dioxane in drinking water.

Introduction

This fact sheet, developed by the U.S. Environmental Protection Agency (EPA) Federal Facilities Restoration and Reuse Office (FFRRO), provides a summary of the emerging contaminant 1,4-dioxane, including physical and chemical properties; environmental and health impacts; existing federal and state guidelines; detection and treatment methods; and additional sources of information. This fact sheet is intended for use by site managers who may address 1,4-dioxane at cleanup sites or in drinking water supplies and for those in a position to consider whether 1,4-dioxane should be added to the analytical suite for site investigations.

1,4-Dioxane is a likely human carcinogen and has been found in groundwater at sites throughout the United States. The physical and chemical properties and behavior of 1,4-dioxane create challenges for its characterization and treatment. It is highly mobile and does not readily biodegrade in the environment.

What is 1,4-dioxane?

- 1,4-Dioxane is a synthetic industrial chemical that is completely miscible in water (EPA 2006; ATSDR 2012).
- Synonyms include dioxane, dioxan, p-dioxane, diethylene dioxide, diethylene oxide, diethylene ether and glycol ethylene ether (EPA 2006; ATSDR 2012; Mohr 2001).
- 1,4-Dioxane is unstable at elevated temperatures and pressures and may form explosive mixtures with prolonged exposure to light or air (EPA 2006; HSDB 2011).
- 1,4-Dioxane is a likely contaminant at many sites contaminated with certain chlorinated solvents (particularly 1,1,1-trichloroethane [TCA]) because of its widespread use as a stabilizer for chlorinated solvents (EPA 2013a; Mohr 2001). Historically, the main use (90 percent) of 1,4-dioxane was as a stabilizer of chlorinated solvents such as TCA (ATSDR 2012). Use of TCA was phased out under the 1995 Montreal Protocol and the use of 1,4-dioxane as a solvent stabilizer was terminated (ECJRC 2002; NTP 2016). Lack of recent reports for other previously reported uses suggest that many other industrial, commercial and consumer uses were also stopped.

- It is a by-product present in many goods, including paint strippers, dyes, greases, antifreeze and aircraft deicing fluids, and in some consumer products (deodorants, shampoos and cosmetics) (ATSDR 2012; Mohr 2001).
- 1,4-Dioxane is used as a purifying agent in the manufacture of pharmaceuticals and is a by-product in the manufacture of polyethylene terephthalate (PET) plastic (Mohr 2001).
- Traces of 1,4-dioxane may be present in some food supplements, food containing residues from packaging adhesives or on food crops treated with pesticides that contain 1,4-dioxane (ATSDR 2012; DHHS 2011).

Exhibit 1: Physical and Chemical Properties of 1,4-Dioxane (ATSDR 2012)

Property	1,4-Dioxane
Chemical Abstracts Service (CAS) number	123-91-1
Physical description (physical state at room temperature)	Clear, flammable liquid with a faint, pleasant odor
Molecular weight (g/mol)	88.11
Water solubility	Miscible
Melting point (^{o}C)	11.8
Boiling point (^{o}C) at 760 mm Hg	101.1
Vapor pressure at 25^{o}C (mm Hg)	38.1
Specific gravity	1.033
Octanol-water partition coefficient (log K_{ow})	-0.27
Organic carbon partition coefficient (log K_{oc})	1.23
Henry's law constant at 25 ^{o}C (atm-m^{3}/mol)	4.80 X 10^{-6}

Abbreviations: g/mol – grams per mole; ^{o}C – degrees Celsius; mm Hg – millimeters of mercury; atm-m^{3}/mol – atmosphere-cubic meters per mole

Existence of 1,4-dioxane in the environment

- 1,4-Dioxane is typically found at some solvent release sites and PET manufacturing facilities (ATSDR 2012; Mohr 2001).
- It is short-lived in the atmosphere, with an estimated 1- to 3-day half-life due to photooxidation (ATSDR 2012; DHHS 2011).
- Migration to groundwater is weakly retarded by sorption of 1,4-dioxane to soil particles; it is expected to move rapidly from soil to groundwater (EPA 2006; ATSDR 2012).
- It is relatively resistant to biodegradation in water and soil, although recent studies have identified degrading bacteria (Inoue 2016; Pugazhendi 2015; Sales 2013).
- It does not bioaccumulate, biomagnify, or bioconcentrate in the food chain (ATSDR 2012; Mohr 2001).
- 1,4-Dioxane is frequently present at sites with TCA contamination (Mohr 2001; Adamson 2014).
- It may migrate rapidly in groundwater, ahead of other contaminants (DHHS 2011; EPA 2006).
- Where delineated, 1,4-dioxane is frequently found within previously delineated chlorinated solvent plumes and existing monitoring networks (Adamson 2014).
- As of 2016, 1,4-dioxane had been identified at more than 34 sites on the EPA National Priorities List (NPL); it may be present (but samples were not analyzed for it) at many other sites (EPA 2016b).

What are the routes of exposure and the potential health effects of 1,4-dioxane?

- Exposure may occur through ingestion of contaminated food and water, or dermal contact. Worker exposures may include inhalation of vapors (ATSDR 2012; DHHS 2011; EU 2002).
- Potential exposure could occur during production and use of 1,4-dioxane as a stabilizer or solvent (DHHS 2011; EU 2002).
- Short-term exposure to high levels of 1,4-dioxane may result in nausea, drowsiness, headache, and irritation of the eyes, nose and throat (ATSDR 2012; EPA 2013b; NIOSH 2010; EU 2002). 1,4-Dioxane is readily absorbed through the lungs and gastrointestinal tract. Some 1,4-dioxane may also pass through the skin, but studies indicate that much of it will evaporate before it is absorbed. Distribution is rapid and uniform in the lung, liver, kidney, spleen, colon and skeletal muscle tissue (ATSDR 2012).
- 1,4-Dioxane is weakly genotoxic and reproductive effects in humans are unknown; however, a developmental study on rats indicated that 1,4-dioxane may be slightly toxic to the developing fetus (ATSDR 2012; Giavini and others 1985).
- Animal studies showed increased incidences of nasal cavity, liver and gall bladder tumors after exposure to 1,4-dioxane (ATSDR 2012; DHHS 2011; EPA IRIS 2013).
- EPA has classified 1,4-dioxane as "likely to be carcinogenic to humans" by all routes of exposure (EPA IRIS 2013).
- The U.S. Department of Health and Human Services states that "1,4-dioxane is reasonably anticipated to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in experimental animals" (DHHS 2011).
- The National Institute for Occupational Safety and Health (NIOSH) considers 1,4-dioxane a potential occupational carcinogen (NIOSH 2010).
- The European Union has classified 1,4-dioxane as having limited evidence of carcinogenic effect (EU 2002).

Are there any federal and state guidelines and health standards for 1,4-dioxane?

- EPA's Integrated Risk Information System (IRIS) database includes a chronic oral reference dose (RfD) of 0.03 milligrams per kilogram per day (mg/kg/day) based on liver and kidney toxicity in animals and a chronic inhalation reference concentration (RfC) of 0.03 milligrams per cubic meter (mg/m^3) based on atrophy and respiratory metaplasia inside the nasal cavity of animals (EPA IRIS 2013).
- The cancer risk assessment for 1,4-dioxane is based on an oral slope factor of 0.1 mg/kg/day and the drinking water unit risk is 2.9×10^{-6} micrograms per liter (µg/L) (EPA IRIS 2013).
- EPA risk assessments indicate that the drinking water concentration representing a 1×10^{-6} cancer risk level for 1,4-dioxane is 0.35 µg/L (EPA IRIS 2013).
- No federal maximum contaminant level (MCL) for drinking water has been established (EPA 2012).
- 1,4-Dioxane is included on the fourth drinking water contaminant candidate list and is included in the Third Unregulated Contaminant Monitoring Rule (EPA 2009; EPA 2016a).
- EPA's drinking water equivalent level is 1 mg/L (EPA 2012). EPA has calculated a screening level of 0.46 µg/L for tap water, based on a 1 in 10^{-6} lifetime excess cancer risk (EPA 2017b).
- EPA established a 1-day health advisory of 4.0 milligrams per liter (mg/L) and a 10-day health advisory of 0.4 mg/L in drinking water for a 10-kilogram child and a lifetime health advisory of 0.2 mg/L in drinking water (EPA 2012).
- EPA has calculated a residential soil screening level (SSL) of 5.3 milligrams per kilogram (mg/kg) and an industrial SSL of 24 mg/kg. The soil-to-groundwater risk-based SSL is 9.4×10^{-5} mg/kg (EPA 2017b).
- EPA has calculated a residential air screening level of 0.56 micrograms per cubic meter ($µg/m^3$) and an industrial air screening level of 2.5 $µg/m^3$ (EPA 2017b).
- A reportable quantity of 100 pounds has been established under the Comprehensive Environmental Response, Compensation, and Liability Act (EPA 2011).
- The Occupational Safety and Health Administration (OSHA) established a permissible

exposure limit (PEL) for 1,4-dioxane of 100 parts per million (ppm) or 360 mg/m^3 as an 8-hour time weighted average (TWA). While OSHA has established a PEL for 1,4-dioxane, OSHA has recognized that many of its PELs are outdated and inadequate for ensuring the protection of worker health. OSHA recommends that employers follow the California OSHA limit of 0.28 ppm, the NIOSH recommended exposure limit of 1 ppm as a 30-minute ceiling, or the American Conference of Governmental Industrial Hygienists threshold limit value of 20 ppm (OSHA 2017).

- Various states have established drinking water and groundwater guidelines, including the following:

State	Guideline (µg/L)	Source
Alaska	77	AL DEC 2016
California	1.0	Cal/EPA 2011
Colorado	0.35	CDPHE 2017
Connecticut	3.0	CTDPH 2013
Delaware	6.0	DE DNR 1999
Florida	3.2	FDEP 2005
Indiana	7.8	IDEM 2015
Maine	4.0	MEDEP 2016
Massachusetts	0.3	MADEP 2004
Mississippi	6.09	MS DEQ 2002
New Hampshire	0.25	NH DES 2011
New Jersey	0.4	NJDEP 2015
North Carolina	3.0	NCDENR 2015
Pennsylvania	6.4	PADEP 2011
Texas	9.1	TCEQ 2016
Vermont	3.0	VTDEP 2016
Washington	0.438	WA ECY 2015
West Virginia	6.1	WV DEP 2009

What detection and site characterization methods are available for 1,4-dioxane?

- As a result of the limitations in the analytical methods to detect 1,4-dioxane, it has been difficult to identify its occurrence in the environment. The miscibility of 1,4-dioxane in water causes poor purging efficiency and results in high detection limits (ATSDR 2012; EPA 2006; Mohr 2001).
- The Contract Laboratory Program SOW SOM02.3 includes a CRQL of 2.0 µg/L in water, 67 µg/kg in low soil and 2,000 µg/kg in medium soil (EPA 2013c).
- Conventional analytical methods can detect 1,4-dioxane only at concentrations 100 times greater than the concentrations of volatile organic compounds. Modifications of existing analytical methods and their sample preparation procedures may be needed to achieve lower detection limits for 1,4-dioxane (EPA 2006; Mohr 2001).
- High-temperature sample preparation techniques improve the recovery of 1,4-dioxane. These techniques include purging at elevated temperature (EPA SW-846 Method 5030); equilibrium headspace analysis (EPA SW-846 Method 5021); vacuum distillation (EPA SW-846 Method 8261); and azeotropic distillation (EPA SW-846 Method 5031) (EPA 2006).
- NIOSH Method 1602 uses gas chromatography – flame ionization detection (GC-FID) to determine the concentration of 1,4-dioxane in air (ATSDR 2012; NIOSH 2010).
- EPA SW-846 Method 8015D uses gas chromatography (GC) to determine the concentration of 1,4-dioxane in environmental samples. Samples may be introduced into the GC column by a variety of techniques including the injection of the concentrate from azeotropic distillation (EPA SW-846 Method 5031). The lower quantitation limits for 1,4-dioxane in aqueous matrices by azeotropic microdistillation are 12 µg/L (reagent water), 15 µg/L (groundwater) and 16 µg/L (leachate) (EPA 2003).
- EPA SW-846 Method 8260B detects 1,4-dioxane in a variety of solid waste matrices using GC and mass spectrometry (MS). The detection limit

depends on the instrument and choice of sample preparation method (ATSDR 2012).

- A laboratory study is underway to develop a passive flux meter (PFM) approach to enhance the capture of 1,4-dioxane in the PFM sorbent to improve accuracy. Results to date show that the PFM is capable of quantifying low absorbing compounds such as 1,4-dioxane (DoD SERDP 2013b).
- EPA Method 1624 uses isotopic dilution gas chromatography – mass spectrometry (GC-MS) to detect 1,4-dioxane in water, soil and municipal discharges. The detection limit for this method is 10 µg/L (ATSDR 2012; EPA 2001b).
- EPA SW-846 Method 8270 uses liquid-liquid extraction and isotope dilution by capillary column GC-MS. This method is often modified for the detection of low levels of 1,4-dioxane in water (EPA 2007).
- EPA Method 522 uses solid phase extraction and GC-MS with selected ion monitoring for the detection of 1,4-dioxane in drinking water with detection limits as low as 0.02 µg/L (EPA 2008).
- GC-MS detection methods using solid phase extraction followed by desorption with an organic solvent have been developed to remove 1,4-dioxane from the aqueous phase. Detection limits as low as 0.03 µg/L have been achieved by passing the aqueous sample through an activated carbon column, following by elution with acetone-dichloromethane (ATSDR 2012; Kadokami and others 1990).
- Lab studies indicate effective methods for monitoring growth of dioxane-degrading bacteria in culture (Gedalanga 2014).
- Studies are underway to develop and assess methods for performing compound-specific isotope analysis (CSIA) on low levels of 1,4-dioxane in groundwater (DoD SERDP 2016).

What technologies are being used to treat 1,4-dioxane?

- Pump-and-treat remediation can treat dissolved 1,4-dioxane in groundwater and control groundwater plume migration, but requires ex-situ treatment tailored for the unique properties of 1,4-dioxane (e.g., its low octanol-water partition coefficient makes 1,4-dioxane hydrophilic) (EPA 2006; Kiker and others 2010).
- Commercially available advanced oxidation processes using hydrogen peroxide with ultraviolet light or ozone can be used to treat 1,4-dioxane in wastewater (Asano and others 2012; EPA 2006).
- Peroxone and iron activated persulfate oxidation of 1,4-dioxane might aid in the cleanup of VOC-contaminated sites (Eberle 2015; Zhong 2015; Li 2016; SERDP 2013d).
- In-situ chemical oxidation can be successfully combined with bioaugmentation for managing dioxane contamination (DoD SERDP 2013d; Adamson 2015).
- Ex-situ bioremediation using a fixed-film, moving-bed biological treatment system is also used to treat 1,4-dioxane in groundwater (EPA 2006).
- Electrical resistance heating may be an effective treatment method (Oberle 2015).
- Phytoremediation is being explored as a means to remove the compound from shallow groundwater. Pilot-scale studies have demonstrated the ability of hybrid poplars to take up and effectively degrade or deactivate 1,4-dioxane (EPA 2001a, 2013a; Ferro and others 2013).
- Microbial degradation in engineered bioreactors has been documented under enhanced conditions or where selected strains of bacteria capable of degrading 1,4-dioxane are cultured, but the impact of the presence of chlorinated solvent co-contaminants on biodegradation of 1,4-dioxane needs to be further investigated (EPA 2006, 2013a; Mahendra and others 2013).
- Results from a 2012 laboratory study found 1,4-dioxane-transforming activity to be relatively common among monooxygenase-expressing bacteria; however, both TCA and 1,1-dichloroethene inhibited 1,4-dioxane degradation by bacterial isolates (DoD SERDP 2012).
- Isobutane-metabolizing bacteria can consistently degrade low (<100 ppb) concentrations of 1,4-dioxane, often to concentrations <1 ppb. These organisms also can degrade many chlorinated co-contaminants such as TCA and 1,1-dichoroethene (1,1-DCE) (DoD SERDP 2013c).
- Ethane effectively serves as a cometabolite for facilitating the biodegradation of 1,4-dioxane at relevant field concentrations (DoD SERDP 2013f).
- Biodegradation rates are subject to interactions among transition metals and natural organic ligands in the environment. (Pornwongthong 2014; DoD SERDP 2013e).

- Photocatalysis has been shown to remove 1,4-dioxane in aqueous solutions. Laboratory studies documented that the surface plasmon resonance of gold nanoparticles on titanium dioxide (Au – TiO2) promotes the photocatalytic degradation of 1,4-dioxane (Min and others 2009; Vescovi and others 2010).
- Other in-well combined treatment technologies being assessed include air sparging; soil vapor extraction (SVE); enhanced bioremediation-oxidation; and dynamic subsurface groundwater circulation (Odah and others 2005).
- 1,4-Dioxane was reduced by greater than 90 percent in the treatment zone with no apparent downward migration of 1,4-dioxane using enhanced or extreme SVE, which uses a combination of increased air flow, sweeping with drier air, increased temperature, decreased infiltration and more focused vapor extraction to enhance 1,4-dioxane remediation in soils (DoD SERDP 2013a).

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Contact Information

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Appendix B

The Third Unregulated Contaminant Monitoring Rule (UCMR 3) Fact Sheets

United States Environmental Protection Agency

The Third Unregulated Contaminant Monitoring Rule (UCMR 3)

Searching for Emerging Contaminants in Drinking Water

What is the Unregulated Contaminant Monitoring Rule?

The 1996 amendments to the Safe Drinking Water Act (SDWA) require that once every five years, the U.S. Environmental Protection Agency (EPA) issue a new list of no more than 30 unregulated contaminants to be monitored by public water systems (PWSs). The Unregulated Contaminant Monitoring Rule (UCMR) provides EPA and other interested parties with scientifically valid data on the occurrence of contaminants in drinking water. These data serve as a primary source of occurrence and exposure information that the agency uses to develop regulatory decisions.

The final rule "Revisions to the Unregulated Contaminant Monitoring Rule (UCMR 3) for Public Water Systems" was published in the *Federal Register* on May 2, 2012 (77 FR 26072). UCMR 3 monitoring will take place from 2013-2015, and includes monitoring for 28 chemicals and two viruses.

What contaminants are systems looking for as part of UCMR 3?

Under UCMR 3, public water systems or EPA will conduct sampling and analysis for Assessment Monitoring (List 1), Screening Survey (List 2), and Pre-Screen Testing (List 3) contaminants, as follows:

UCMR 3 Contaminant List			
Assessment Monitoring (List 1 Contaminants)			
1,2,3-trichloropropane	bromomethane (methyl bromide)	chloromethane (methyl chloride)	bromochloromethane (Halon 1011)
chlorodifluoromethane (HCFC-22)	1,3-butadiene	1,1-dichloroethane	1,4-dioxane
vanadium	molybdenum	cobalt	strontium
chromium[1]	chromium-6[2]	chlorate	perfluorooctanesulfonic acid (PFOS)
perfluorooctanoic acid (PFOA)	perfluorobutanesulfonic acid (PFBS)	perfluorohexanesulfonic acid (PFHxS)	perfluoroheptanoic acid (PFHpA)
perfluorononanoic acid (PFNA)			
Screening Survey (List 2 Contaminants)			
17-β-estradiol	estriol	estrone	4-androstene-3,17-dione
17-α-ethynylestradiol	equilin	testosterone	
Pre-Screen Testing[3] (List 3 Contaminants)			
enteroviruses	noroviruses		

1. Monitoring for total chromium, in conjunction with UCMR 3 Assessment Monitoring, is required under the authority provided in Section 1445 (a)(1)(A) of SDWA.
2. Chromium-6 will be measured as soluble chromate (ion).
3. Monitoring for microbial indicators, in conjunction with Pre-Screen Testing, will be conducted, including: total coliforms, *E.coli*, bacteriophage, *Enterococci* and aerobic spores. EPA will pay for all sampling and analysis costs for the small systems selected for this monitoring.

Which water systems will participate in UCMR 3?

The UCMR program divides contaminants into three types of monitoring. UCMR 3 includes monitoring under each of the three lists:

- **Assessment Monitoring (List 1):** All PWSs serving more than 10,000 people (i.e., large systems) and 800 representative PWSs serving 10,000 or fewer people (i.e., small systems) will monitor for 21 chemicals during a 12-month period from 2013-2015.
- **Screening Survey (List 2):** All PWSs serving more than 100,000 people, a representative sample of 320 large PWSs serving 10,001 to 100,000 people, and a representative sample of 480 small PWSs serving 10,000 or fewer people will monitor for seven chemicals during a 12-month period from 2013-2015.

- **Pre-Screen Testing (List 3):** A representative selection of 800 undisinfected ground water PWSs serving 1,000 or fewer people will participate in monitoring for two viruses (i.e., enterovirus and norovirus) and related pathogen indicators (i.e., total coliforms, *E. coli*, bacteriophage, *Enterococci*, and aerobic spores) during a 12-month period from 2013-2015. The virus monitoring will take place in sensitive hydrogeological areas (e.g., karst or fractured bedrock).

Approximately, 6,000 PWSs are participating in UCMR 3. All laboratories conducting analyses for UCMR 3 List 1 and List 2 contaminants must receive EPA approval to perform those analyses (see "UCMR 3 Laboratory Approval Requirements and Information Document" for details of the EPA laboratory approval program). Pre-Screen Testing (List 3) analyses for viruses and indicators are organized and paid for by EPA through direct contracts with laboratories.

Where will samples be collected?

UCMR 3 samples are to be collected at entry points to the distribution system for all contaminants. Assessment Monitoring systems must also sample for chromium, chromium-6, cobalt, molybdenum, strontium, vanadium, and chlorate in the distribution system.

What does UCMR 3 participation involve? What does it cost?

Participating systems collect drinking water samples and have them tested for UCMR contaminants. Large PWSs (systems serving more than 10,000 people) pay for their own testing costs ($50-$470 per sample, per testing method, on average). EPA pays for the testing costs of small PWSs (systems serving 10,000 or fewer people) and manages the small system monitoring.

How did EPA select the UCMR 3 contaminants?

EPA used a stepwise prioritization process to identify potential UCMR 3 contaminants. An agency and state working group first reviewed the third Contaminant Candidate List (CCL 3), as well as the contaminants considered in the development of CCL 3. The final CCL 3 is comprised of contaminants that were selected through a data-driven process that considered adverse health effects (potency and severity) and occurrence (prevalence and magnitude). EPA used CCL 3, along with additional sources of information about other emerging contaminants of potential concern, to establish an initial list of potential UCMR 3 contaminants. This list was further pared down by eliminating contaminants with methods that would not be ready for UCMR 3 monitoring and contaminants included in UCMR 1 or UCMR 2 monitoring. EPA published this proposed list of 30 contaminants in the Federal Register on March 3, 2011. After receiving and considering public comments on the proposed list, EPA added chromium-6 and total chromium to UCMR 3, and removed *sec*-butylbenzene and *n*-propylbenzene, both non-carcinogenic VOCs.

What does this information mean to me?

Contaminant monitoring is part of a larger process that EPA, states, tribes, water systems, and other partners use to protect drinking water. Health information is necessary to know whether these contaminants pose a health risk, but it is often incomplete for unregulated contaminants. Some contaminants maybe harmful at low levels; others may be harmful only at much higher levels. UCMR examines what is in the drinking water, but additional health information is needed to know whether these contaminants pose a health risk.

What are the environmental and public health benefits?

UCMR 3 benefits the environment and public health as follows: EPA and other interested parties will have scientifically valid data on the occurrence of targeted contaminants in drinking water; EPA can assess the number of people potentially being exposed; and EPA can provide an estimate of the levels of that exposure. This data set is one of the primary sources of occurrence and exposure information the agency uses to develop regulatory decisions for contaminants of concern.

Where can consumers find UCMR results?

If a PWS monitoring for UCMR 3 finds contaminants in its drinking water, it provides the information to its customers in an annual water quality report (called a Consumer Confidence Report). This includes both regulated and unregulated contaminants. Most systems mail these reports directly to customers, and many reports are available from EPA's website. EPA also makes the results available online via its National Drinking Water Contaminant Occurrence Database, http://water.epa.gov/scitech/datait/databases/drink/ncod/databases-index.cfm. These results will be posted on an ongoing basis after they have been reviewed for quality.

How can I learn more?

For general information on UCMR 3, go to: http://water.epa.gov/lawsregs/rulesregs/sdwa/ucmr/ucmr3/ or contact the Safe Drinking Water Hotline at (800) 426-4791, or at: http://water.epa.gov/drink/contact.cfm.

United States Environmental Protection Agency

The Third Unregulated Contaminant Monitoring Rule (UCMR 3)

Fact Sheet for Assessment Monitoring (List 1 Contaminants)

Overview of the Rule

- **Title**: Revisions to the Unregulated Contaminant Monitoring Rule for Public Water Systems; 77 FR 26072, May 2, 2012.
- **Purpose**: To collect occurrence data for contaminants suspected to be present in drinking water but that do not have health-based standards set under the Safe Drinking Water Act (SDWA). Assessment Monitoring targets contaminants that are analyzed with methods that utilize existing and widely used technology. The UCMR program is the primary source of drinking water contaminant occurrence data used by EPA in regulatory determinations.
- **Description**: UCMR 3 includes Assessment Monitoring for 21 List 1 chemical contaminants using six EPA-approved analytical methods and four equivalent consensus methods. List 1 contaminants are always associated with an Assessment Monitoring sampling design. Public water systems (PWSs) subject to Assessment Monitoring will sample within a 12-month period during 2013 - 2015.
- **Utilities Affected**: Community water systems (CWSs) and non-transient non-community water systems (NTNCWSs) with more than 10,000 retail customers and a representative sample of 800 systems serving 10,000 or fewer retail customers are required to conduct Assessment Monitoring.
- **Occurrence Data**: The analytical results from UCMR 3 are stored in the National Contaminant Occurrence Database (NCOD). For a summary of the NCOD results, tips for querying NCOD, and health effects information (including reference concentrations) please refer to the UCMR 3 Data Summary document.

Assessment Monitoring (List 1 Contaminants)

Contaminant / CASRN[1]	MRL[2] (µg/L)	Use or Environmental Source[3]
Volatile Organic Compounds: EPA Method 524.3		
1,2,3-trichloropropane 96-18-4	0.03	Halogenated alkane; used as an ingredient in paint, varnish remover, solvents and degreasing agents
1,3-butadiene 106-99-0	0.1	Alkene; used in rubber manufacturing and occurs as a gas
chloromethane (methyl chloride) 74-87-3	0.2	Halogenated alkane; used as foaming agent, in production of other substances, and by-product that can form when chlorine used to disinfect drinking water
1,1-dichloroethane 75-34-3	0.03	Halogenated alkane; used as a solvent
bromomethane 74-83-9	0.2	Halogenated alkane; occurs as a gas, and used as a fumigant on soil before planting, on crops after harvest, on vehicles and buildings, and for other specialized purposes
chlorodifluoromethane (HCFC-22) 75-45-6	0.08	Chlorofluorocarbon; occurs as a gas, and used as a refrigerant, as a low-temperature solvent, and in fluorocarbon resins, especially tetrafluoroethylene polymers
bromochloromethane (Halon 1011) 74-97-5	0.06	Used as a fire-extinguishing fluid, an explosive suppressant, and as a solvent in the manufacturing of pesticides

Synthetic Organic Compound: EPA Method 522		
1,4-dioxane 123-91-1	0.07	Cyclic aliphatic ether; used as a solvent or solvent stabilizer in manufacture and processing of paper, cotton, textile products, automotive coolant, cosmetics and shampoos
Metals: EPA Method 200.8; SM 3125; ASTM D5763-10[4]		
vanadium 7440-62-2	0.2	Naturally-occurring elemental metal; used as vanadium pentoxide which is a chemical intermediate and a catalyst
molybdenum 7439-98-7	1	Naturally-occurring element found in ores and present in plants, animals and bacteria; commonly used form molybdenum trioxide used as a chemical reagent
cobalt 7440-48-4	1	Naturally-occurring element found in the earth's crust and at low concentrations in seawater, and in some surface and ground water; cobaltous chloride was formerly used in medicine and as a germicide
strontium 7440-24-6	0.3	Naturally-occurring element; historically, commercial use of strontium has been in the faceplate glass of cathode-ray tube televisions to block x-ray emissions
chromium[5] CASRN n/a	0.2	See chromium-6 for use or source information; though the amount measured when analyzing for "total chromium" is the sum of chromium in all of its valence states, the MCL for EPA's current total chromium regulation was determined based upon the health effects of chromium-6
Chromium-6: EPA Method 218.7		
chromium-6[6] 18540-29-9	0.03	Naturally-occurring element; used in making steel and other alloys; chromium-3 or -6 forms are used for chrome plating, dyes and pigments, leather tanning, and wood preservation
Oxyhalide Anion: EPA Method 300.1; SM 4110D; ASTM D658-08		
chlorate 14866-68-3	20	Agricultural defoliant or desiccant; disinfection byproduct; and used in production of chlorine dioxide
Perfluorinated Compounds: EPA Method 537		
perfluorooctanesulfonic acid (PFOS) 1763-23-1	0.04	Surfactant or emulsifier; used in fire-fighting foam, circuit board etching acids, alkaline cleaners, floor polish, and as a pesticide active ingredient for insect bait traps; U.S. manufacture of PFOS phased out in 2002; however, PFOS still generated incidentally
perfluorooctanoic acid (PFOA) 335-67-1	0.02	Perfluorinated aliphatic carboxylic acid; used for its emulsifier and surfactant properties in or as fluoropolymers (such as Teflon), fire-fighting foams, cleaners, cosmetics, greases and lubricants, paints, polishes, adhesives and photographic films
perfluorononanoic acid (PFNA) 375-95-1	0.02	Manmade chemical; used in products to make them stain, grease, heat and water resistant
perfluorohexanesulfonic acid (PFHxS) 355-46-4	0.03	Manmade chemical; used in products to make them stain, grease, heat and water resistant
perfluoroheptanoic acid (PFHpA) 375-85-9	0.01	Manmade chemical; used in products to make them stain, grease, heat and water resistant
perfluorobutanesulfonic acid (PFBS) 375-73-5	0.09	Manmade chemical; used in products to make them stain, grease, heat and water resistant

1. CASRN - Chemical Abstracts Service Registry Number
2. MRL - Minimum Reporting Level
3. "Use or Environmental Source" further documented in UCMR 3 Contaminants – Information Compendium. EPA 815-B-11-001. January 2012
4. SM – Standard Methods; ASTM – ASTM International
5. Monitoring for total chromium, in conjunction with UCMR 3 Assessment Monitoring, is required under the authority provided in Section 1445(a)(1)(A) of SDWA
6. Chromium-6 will be measured as soluble chromate ion (CASRN 13907-45-4)

Assessment Monitoring

- **Time frame**: One consecutive 12-month period during January 2013 - December 2015 (monitoring can span more than one calendar year, as long as conducted during a consecutive 12-month period).
- **Frequency**: *Ground Water*: Monitoring will occur twice in one consecutive 12-month period. Sample events must occur 5 - 7 months apart. *Surface Water or GUDI*: Monitoring will occur in 4 consecutive quarters, with sampling events occurring 3 months apart.
- **Location:** Entry point to the distribution system (EPTDS) for all contaminants, as well as distribution system maximum residence time sampling locations for chromium, chromium-6, cobalt, molybdenum, strontium, vanadium and chlorate.
- **Laboratories**: Samples must be analyzed by EPA-approved laboratories.

Critical Deadlines and Requirements

Due Date	Requirement	Report through SDWARS[1]	Contact Sampling Coordinator[2]
Following Rule Publication			
October 1, 2012	Systems must submit **contact information** to SDWARS. (Any subsequent changes must be submitted within 30 days of the change occurring).	X	
	Laboratories seeking approval must submit a registration form to participate in the **laboratory approval process**.		X
August 1, 2012	**Ground water** systems that wish to monitor from **representative EPTDSs** must submit either state-approved, UCMR 2-approved or propose a new representative sampling plan.		X
October 1, 2012	Deadline for systems to **change their monitoring schedule** (after October 1, systems must provide an explanation for the requested schedule change and obtain EPA approval of the change).	X	X (after October 1)
	PWSs review/edit if necessary, **inventory information** for sampling locations.	X	X (after October 1)
Following Sample Collection			
Within 120 days of sample collection	**Laboratories post data** to SDWARS.	X	
Within 60 days of lab posting data	**PWSs review and approve the data**. If the PWS has not taken action after 60 days, the data are considered approved and ready for state and EPA review.	X	

1. Safe Drinking Water Accession and Review System
2. Contact via email at: UCMR_Sampling_Coordinator@epa.gov.

Data Elements

Public Water System Identification (PWSID) Code	Sampling Point Identification Code	Sample Collection Date	Analytical Method Code	Analytical Result–Value
Public Water System Facility Identification Code	Sampling Point Type Code	Sample Identification Code	Sample Analysis Type	Laboratory Identification Code
Water Source Type	Disinfectant Type	Contaminant	Analytical Results–Sign	Sample Event Code

Additional Information

The **Public Notification Rule** (40 CFR §141.207), published on May 4, 2000 (65 FR 25982) with amendments and corrections included in the Code of Federal Regulations for the Public Notification Rule published on July 1, 2006, requires PWSs to notify the public annually that the results of monitoring for unregulated contaminants are available. CWSs may include their public notice within their CCRs. Details on these reporting requirements can be found in the document: Revised Public Notification Handbook (EPA 816-R-09-013).

Under the **Consumer Confidence Report (CCR) Rule**, as specified in 40 CFR §141.153(d), CWSs must report the monitoring results whenever unregulated contaminants are detected. CCRs are delivered to all billing customers each year by July 1. (The CCR Rule does not apply to non-community water systems). Details on these reporting requirements can be found on the CCR Home Page.

For More Information

- Safe Drinking Water Hotline: (800) 426 – 4791
- CDX/SDWARS Help Desk: (888) 890 – 1995
- UCMR Homepage

Appendix C

EDR Radius Map Report

Midway Landfill
24800 Pacific Highway S
Kent, WA 98032

Inquiry Number: 5052930.2s
September 18, 2017

The EDR Radius Map™ Report

6 Armstrong Road, 4th floor
Shelton, CT 06484
Toll Free: 800.352.0050
www.edrnet.com

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Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

EXECUTIVE SUMMARY

A search of available environmental records was conducted by Environmental Data Resources, Inc (EDR). The report was designed to assist parties seeking to meet the search requirements of EPA's Standards and Practices for All Appropriate Inquiries (40 CFR Part 312), the ASTM Standard Practice for Environmental Site Assessments (E 1527-13) or custom requirements developed for the evaluation of environmental risk associated with a parcel of real estate.

TARGET PROPERTY INFORMATION

ADDRESS

24800 PACIFIC HIGHWAY S
KENT, WA 98032

COORDINATES

Latitude (North):	47.3790070 - 47° 22' 44.42''
Longitude (West):	122.2950190 - 122° 17' 42.06''
Universal Tranverse Mercator:	Zone 10
UTM X (Meters):	553217.9
UTM Y (Meters):	5247305.5
Elevation:	300 ft. above sea level

USGS TOPOGRAPHIC MAP ASSOCIATED WITH TARGET PROPERTY

Target Property Map:	6005105 DES MOINES, WA
Version Date:	2014
South Map:	6005095 POVERTY BAY, WA
Version Date:	2014

AERIAL PHOTOGRAPHY IN THIS REPORT

Portions of Photo from:	20150807
Source:	USDA

MAPPED SITES SUMMARY

Target Property Address:
24800 PACIFIC HIGHWAY S
KENT, WA 98032

Click on Map ID to see full detail.

MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
A1	MIDWAY LANDFILL	24800 PACIFIC HWY S.	NPL, SEMS, US ENG CONTROLS, US INST CONTROL, WA...		TP
A2	MIDWAY LANDFILL	24800 PACIFIC HWY S.	FINDS		TP
3	ROCK AUTOMOTIVE	2824 S 252ND ST	EDR Hist Auto	Higher	44, 0.008, SSW
B4		24602 PACIFIC HWY S	WA UST, RCRA NonGen / NLR	Higher	129, 0.024, NNW
B5		24602 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, WA AIRS, WA...	Higher	129, 0.024, NNW
C6	MIDWAY RENTAL AND OI	24432 PACIFIC HWY S.	WA ICR	Higher	218, 0.041, NNW
C7	CAR PROS INC	24432 PACIFIC HWY S	WA UST, WA ALLSITES, WA CSCSL NFA, RCRA NonGen /...	Higher	218, 0.041, NNW
D8	MIDWAY PHENYLACETIC	24408 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO	Higher	219, 0.041, NNW
E9	AUTOMOTIVE MARKETING	24806 S PACIFIC HWY	EDR Hist Auto	Higher	273, 0.052, West
F10	ELECTRIC POWER TOOL	24611 PACIFIC HWY S	EDR Hist Auto	Higher	301, 0.057, NW
F11	OKIMOTO PROPERTY	6500 6600 & 6800 S 2	WA CSCSL, WA ALLSITES, FINDS	Higher	326, 0.062, NW
G12	MIDWAY CLASSIC CLEAN	24860 PACIFIC HWY S	EDR Hist Cleaner	Higher	352, 0.067, WSW
D13	B & B AIRCRAFT (THRE	24401 PACIFIC HWY S.	WA ICR	Higher	375, 0.071, NNW
E14	SEA TAC TRANSMISSION	24805 S PACIFIC HWY	EDR Hist Auto	Higher	379, 0.072, West
F15	UNITED STTES AMER QL	24453 PACIFIC HWY S	EDR Hist Auto	Higher	382, 0.072, NW
F16	NORTHWEST POWDER COA	24453 PACIFIC HWY S	WA HSL, WA CSCSL, WA ALLSITES, FINDS	Higher	382, 0.072, NW
F17	CHO KEE	24453 PACIFIC HWY S	EDR Hist Cleaner	Higher	382, 0.072, NW
18	MIDNITE MART INC	24645 PACIFIC HWY S	EDR Hist Auto	Higher	383, 0.073, WNW
C19	SKIPS AUTO REBUILD	24441 S PACIFIC HWY	EDR Hist Auto	Higher	387, 0.073, NW
C20		24433 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO	Higher	392, 0.074, NW
C21	SEA-TAC TRANSMISSION	24433 PACIFIC HWY S	EDR Hist Auto	Higher	392, 0.074, NW
G22	ROYAL PUYALLUP INC	25006 PACIFIC HWY S	EDR Hist Auto	Higher	402, 0.076, WSW
E23		HWY 99 & S 248TH ST	WA ALLSITES, RCRA NonGen / NLR	Higher	418, 0.079, West
H24	B & B AIRCRAFT EQUIP	24401 PACIFIC HWY S	WA CSCSL, WA LUST, WA UST, WA ALLSITES, RCRA...	Higher	435, 0.082, NNW
I25	C-DORY INC	25028 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO	Higher	445, 0.084, SW
I26	ROCK AUTOMOTIVE	25026 PACIFIC HWY S	EDR Hist Auto	Higher	457, 0.087, SW
I27	RS COLOR DESIGN INC	25026 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO	Higher	457, 0.087, SW
G28	RS COLOR & DESIGN IN	25015 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO, WA...	Higher	493, 0.093, WSW
G29	SCOOTERS PERFORMANCE	24811 PACIFIC HWY S	EDR Hist Auto	Higher	500, 0.095, WSW
G30	PANADERIA LA GUADALU	24811 PACIFIC HWY S	WA ALLSITES, FINDS	Higher	500, 0.095, WSW
H31	AMERICAN TIRE & EQUI	24401 PACIFIC HWY S	EDR Hist Auto	Higher	509, 0.096, NNW
J32	GAMBOLD JOHN D & SUE	3304 S 251ST PLACE	EDR Hist Auto	Higher	534, 0.101, SE
I33	SIGNMAKERS INC	25017 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO	Higher	536, 0.102, WSW
I34	GLASS REPLACEMENT CE	25045 PACIFIC HWY S	EDR Hist Auto	Higher	552, 0.105, WSW
I35	MIDWAY FRAME AND WHE	25013 S PACIFIC HWY	EDR Hist Auto	Higher	575, 0.109, WSW
I36	MIDWAY TRANSMISSION	25009 PACIFIC HWY SO	WA CSCSL, WA LUST, WA UST, WA ICR, WA ALLSITES	Higher	590, 0.112, WSW
I37	MIDWAY TRANSMISSION	25009 S PACIFIC HWY	EDR Hist Auto	Higher	590, 0.112, WSW
K38	TAM DANT	24520 26TH PL S	EDR Hist Auto	Higher	643, 0.122, NW
L39	S 252ND ST PACIFIC H	S 252ND ST & PACIFIC	WA HSL, WA CSCSL, WA ALLSITES, FINDS	Higher	654, 0.124, SW

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Target Property Address:
24800 PACIFIC HIGHWAY S
KENT, WA 98032

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
40	SEA TAC TRANSMISSION	2628 S 248TH ST	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO	Higher	686, 0.130, West
M41	GRESHAM TRANSFER FAC	24300 PACIFIC HWY S.	WA ICR	Higher	734, 0.139, NNW
M42	WIDING TRANSPORTATIO	24300 PACIFIC HWY S	SEMS-ARCHIVE, RCRA NonGen / NLR	Higher	734, 0.139, NNW
M43	GRESHAM TRANSFER INC	24300 PACIFIC HWY S	WA VCP, WA ALLSITES, WA CSCSL NFA, WA NPDES	Higher	734, 0.139, NNW
M44	WIDING TRANSPORTATIO	24300 PACIFIC HIGHWA	WA UST	Higher	734, 0.139, NNW
K45	VICTORIAN PHASE II (	24512/24517 26TH PLA	WA ICR	Higher	738, 0.140, NW
L46	REDONDO 1 HR CLEANER	27203 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO, WA...	Higher	748, 0.142, SW
J47	FIRE STATION 73 OLD	3514 S 252ND	WA UST, WA ALLSITES, FINDS	Higher	755, 0.143, SE
48	LINDA HEIGHTS PUMP S	3406 S 248TH ST	WA UST, WA ALLSITES	Higher	800, 0.152, East
K49	DAVIS CONSTRUCTION C	24515 26TH PL S	WA INST CONTROL, WA VCP, WA ALLSITES, WA CSCSL NFA	Higher	833, 0.158, NW
N50	HAUSER PROPERTY DAVI	S 244TH & 26TH PL S	WA CSCSL, WA ALLSITES	Higher	879, 0.166, NW
N51		26TH PL S & S 244TH	WA CSCSL, WA ALLSITES, RCRA NonGen / NLR	Higher	879, 0.166, NW
O52	FRED MEYER FM FUEL S	25250 PACIFIC HWY S	WA UST, WA ALLSITES, WA CSCSL NFA, WA Financial...	Higher	936, 0.177, SW
O53	GULL STATION	25250 PACIFIC HWY S.	WA ICR	Higher	936, 0.177, SW
O54	FRED MEYER	25250 PACIFIC HWY S.	WA ICR	Higher	936, 0.177, SW
M55	SEA MAR HEALTH CENTE	24215 PACIFIC HWY S	WA ALLSITES, WA ASBESTOS	Higher	941, 0.178, NNW
P56	LOWES OF KENT MIDWAY	24050 PACIFIC HIGHWA	WA ALLSITES, WA SPILLS, FINDS, WA MANIFEST	Higher	1092, 0.207, North
P57		24050 PACIFIC HIGHWA	RCRA-SQG	Higher	1092, 0.207, North
58	25422 29TH AVENUE S	25422 29TH AVENUE S	US BROWNFIELDS, FINDS	Higher	1096, 0.208, South
Q59		24141 PACIFIC HWY S	RCRA NonGen / NLR	Higher	1102, 0.209, NNW
Q60	JAPANESE AUTO SALES	24141 PACIFIC HWY S	WA CSCSL, WA ALLSITES	Higher	1102, 0.209, NNW
R61	MINI MART	24429 36TH AVE. S.	WA ICR	Higher	1170, 0.222, ENE
62	HARVEYS SKIN DIVING	2505 S 252ND ST	WA ALLSITES, WA SPILLS, RCRA NonGen / NLR, FINDS,...	Higher	1186, 0.225, SW
63	PARKSIDE PARK	2518 SOUTH 244TH STR	WA ALLSITES, WA NPDES	Higher	1220, 0.231, NW
R64	KENT NATIONAL GUARD	24410 MILITARY ROAD	SEMS-ARCHIVE, WA CSCSL, WA LUST, WA BROWNFIELDS,...	Higher	1252, 0.237, ENE
R65	MILITARY DEPARTMENT	24410 MILITARY ROAD	WA ICR	Higher	1252, 0.237, ENE
R66	ORGANIZATIONAL MAINT	24410 MILITARY RD	WA UST	Higher	1252, 0.237, ENE
R67	CENTRAL MINI MART	24526 MILITARY RD S	WA CSCSL, WA LUST, WA UST, WA ALLSITES	Higher	1262, 0.239, ENE
68		25440 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO, WA...	Higher	1328, 0.252, SSW
S69	EXXON #7 7751	24718 36TH AVE. S.	WA ICR	Higher	1378, 0.261, East
S70		24718 36TH AVE S	WA VCP, WA ALLSITES, WA CSCSL NFA, RCRA NonGen /...	Higher	1378, 0.261, East
71	ARCO AM-PM	24001 PACIFIC HWY S	WA CSCSL, WA LUST, WA UST, WA VCP, WA ALLSITES	Higher	1487, 0.282, North
72	KENT CORROSIVE	2630 S 256TH ST	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO	Higher	1575, 0.298, SSW
T73	MIDWAY MUFFLER & RAD	23898 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, FINDS, ECHO	Higher	1733, 0.328, North
T74	UNOCAL #6211	23845 PACIFIC HWY S.	WA ICR	Higher	1738, 0.329, North
T75	HIGHLINE CHEVRON	23845 PACIFIC HWY S	WA UST, WA VCP, WA ALLSITES, WA CSCSL NFA, WA...	Higher	1738, 0.329, North
U76	KENT CITY PUBLIC WOR	5821 S 240TH	WA CSCSL, WA LUST, WA ALLSITES, WA Financial...	Higher	1836, 0.348, NNE
U77	KENT CITY SHOP AREA	5821 S. 240TH	WA ICR	Higher	1836, 0.348, NNE
U78	KENT CITY PARKS DEPT	5821 S 240TH E END O	WA ALLSITES, FINDS, ECHO	Higher	1836, 0.348, NNE

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MAP ID	SITE NAME	ADDRESS	DATABASE ACRONYMS	RELATIVE ELEVATION	DIST (ft. & mi.) DIRECTION
79	KENT HIGHLANDS LANDF	240TH & MILITARY RD	WA HSL, WA CSCSL, WA INST CONTROL, WA ALLSITES	Higher	2038, 0.386, NE
80		25619 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR	Higher	2228, 0.422, SW
81	PARKSIDE ELEMENTARY	2104 S 247TH ST	WA ALLSITES	Lower	2312, 0.438, WNW
82		2400 S 240TH ST	WA CSCSL, WA LUST, WA UST, WA VCP, WA ALLSITES,...	Higher	2355, 0.446, NNW
83		25802 PACIFIC HWY S	WA ALLSITES, RCRA NonGen / NLR, WA MANIFEST	Higher	2424, 0.459, SSW
V84	FLOYD R. HUNT, INC.	3219 S. 259TH PL.	WA ICR	Higher	2445, 0.463, SSE
V85	FLOYD R HUNT INC	3219 S 259TH PL	WA ALLSITES, WA CSCSL NFA	Higher	2445, 0.463, SSE
86	SUNNYCREST ELEMENTAR	24629 42ND AVE S	WA ALLSITES	Higher	2507, 0.475, East
87		23647 PACIFIC HWY S	RCRA-LQG, WA CSCSL, WA VCP, WA ALLSITES, FINDS,...	Higher	2574, 0.488, North
88	SOUTHGATE OIL	23428 PACIFIC HWY S	WA CSCSL, WA LUST, WA UST, WA ICR, WA ALLSITES	Higher	3272, 0.620, North
89	7 ELEVEN STORE 18758	26007 PACIFIC HWY S	WA CSCSL, WA LUST, WA ALLSITES, WA Financial...	Lower	3315, 0.628, SSW
90	CLEANERS 1	26112 PACIFIC HWY S	WA CSCSL, WA ALLSITES, RCRA NonGen / NLR, FINDS,...	Lower	3502, 0.663, SSW
91	MIDWAY SHELL	23031 PACIFIC HWY S	WA CSCSL, WA LUST, WA UST, WA VCP, WA ALLSITES	Higher	4569, 0.865, North
92	SEATTLE MUNICIPAL LA	NE OF MILITARY RD AN	NPL, SEMS, ROD	Lower	4643, 0.879, NE
93	JULIUS ROSSO WHOLESA	24202 FRAGER RD	WA CSCSL, WA LUST, WA UST, WA ALLSITES	Lower	5019, 0.951, ENE

EXECUTIVE SUMMARY

TARGET PROPERTY SEARCH RESULTS

The target property was identified in the following records. For more information on this property see page 8 of the attached EDR Radius Map report:

Site	Database(s)	EPA ID
MIDWAY LANDFILL 24800 PACIFIC HWY S. KENT, WA 98031	NPL Cerclis ID:: 1000851 EPA Id: WAD980638910 SEMS Site ID: 1000851 EPA Id: WAD980638910 US ENG CONTROLS EPA ID:: WAD980638910 EPA ID:: WAD980638910 US INST CONTROL EPA ID:: WAD980638910 WA HSL Facility Type: Hazardous Sites List FSID Number: 2043 Facility Status: CC-O&M/Monitoring WA CSCSL Site Status: Cleanup Complete-Active O&M/Monitoring Facility ID: 2043 Clean Up Siteid: 4729 WA ALLSITES Facility Id: 2043 RCRA NonGen / NLR EPA ID:: WAD980638910 ROD EPA ID:: WAD980638910 FINDS Registry ID:: 110005333638 ECHO WA MANIFEST Facility Site ID Number: 2043 Gen Status CD: XQG EPA ID: WAD980638910	WAD980638910
MIDWAY LANDFILL 24800 PACIFIC HWY S. KENT, WA 98032	FINDS Registry ID:: 110009347288	N/A

EXECUTIVE SUMMARY

DATABASES WITH NO MAPPED SITES

No mapped sites were found in EDR's search of available ("reasonably ascertainable ") government records either on the target property or within the search radius around the target property for the following databases:

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

Proposed NPL ---------- Proposed National Priority List Sites
NPL LIENS ---------- Federal Superfund Liens

Federal Delisted NPL site list

Delisted NPL ---------- National Priority List Deletions

Federal CERCLIS list

FEDERAL FACILITY ---------- Federal Facility Site Information listing

Federal RCRA CORRACTS facilities list

CORRACTS ---------- Corrective Action Report

Federal RCRA non-CORRACTS TSD facilities list

RCRA-TSDF ---------- RCRA - Treatment, Storage and Disposal

Federal RCRA generators list

RCRA-CESQG ---------- RCRA - Conditionally Exempt Small Quantity Generator

Federal institutional controls / engineering controls registries

LUCIS ---------- Land Use Control Information System

Federal ERNS list

ERNS ---------- Emergency Response Notification System

State and tribal landfill and/or solid waste disposal site lists

WA SWF/LF ---------- Solid Waste Facility Database

State and tribal leaking storage tank lists

INDIAN LUST ---------- Leaking Underground Storage Tanks on Indian Land

State and tribal registered storage tank lists

FEMA UST ---------- Underground Storage Tank Listing
WA AST ---------- Aboveground Storage Tank Locations

INDIAN UST ---- Underground Storage Tanks on Indian Land

State and tribal voluntary cleanup sites

INDIAN VCP ---- Voluntary Cleanup Priority Listing

ADDITIONAL ENVIRONMENTAL RECORDS

Local Lists of Landfill / Solid Waste Disposal Sites

WA SWRCY ---- Recycling Facility List
WA SWTIRE ---- Solid Waste Tire Facilities
INDIAN ODI ---- Report on the Status of Open Dumps on Indian Lands
ODI ---- Open Dump Inventory
DEBRIS REGION 9 ---- Torres Martinez Reservation Illegal Dump Site Locations
IHS OPEN DUMPS ---- Open Dumps on Indian Land

Local Lists of Hazardous waste / Contaminated Sites

US HIST CDL ---- Delisted National Clandestine Laboratory Register
WA CDL ---- Clandestine Drug Lab Contaminated Site List
WA HIST CDL ---- List of Sites Contaminated by Clandestine Drug Labs
US CDL ---- National Clandestine Laboratory Register

Local Land Records

LIENS 2 ---- CERCLA Lien Information

Records of Emergency Release Reports

HMIRS ---- Hazardous Materials Information Reporting System
WA SPILLS 90 ---- SPILLS 90 data from FirstSearch

Other Ascertainable Records

FUDS ---- Formerly Used Defense Sites
DOD ---- Department of Defense Sites
SCRD DRYCLEANERS ---- State Coalition for Remediation of Drycleaners Listing
US FIN ASSUR ---- Financial Assurance Information
EPA WATCH LIST ---- EPA WATCH LIST
2020 COR ACTION ---- 2020 Corrective Action Program List
TSCA ---- Toxic Substances Control Act
TRIS ---- Toxic Chemical Release Inventory System
SSTS ---- Section 7 Tracking Systems
RMP ---- Risk Management Plans
RAATS ---- RCRA Administrative Action Tracking System
PRP ---- Potentially Responsible Parties
PADS ---- PCB Activity Database System
FTTS ---- FIFRA/ TSCA Tracking System - FIFRA (Federal Insecticide, Fungicide, & Rodenticide Act)/TSCA (Toxic Substances Control Act)
MLTS ---- Material Licensing Tracking System
COAL ASH DOE ---- Steam-Electric Plant Operation Data
COAL ASH EPA ---- Coal Combustion Residues Surface Impoundments List
PCB TRANSFORMER ---- PCB Transformer Registration Database

RADINFO ---- Radiation Information Database
HIST FTTS ---- FIFRA/TSCA Tracking System Administrative Case Listing
DOT OPS ---- Incident and Accident Data
CONSENT ---- Superfund (CERCLA) Consent Decrees
INDIAN RESERV ---- Indian Reservations
FUSRAP ---- Formerly Utilized Sites Remedial Action Program
UMTRA ---- Uranium Mill Tailings Sites
LEAD SMELTERS ---- Lead Smelter Sites
US MINES ---- Mines Master Index File
ABANDONED MINES ---- Abandoned Mines
UXO ---- Unexploded Ordnance Sites
FUELS PROGRAM ---- EPA Fuels Program Registered Listing
WA COAL ASH ---- Coal Ash Disposal Site Listing
WA UIC ---- Underground Injection Wells Listing

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR MGP ---- EDR Proprietary Manufactured Gas Plants

EDR RECOVERED GOVERNMENT ARCHIVES

Exclusive Recovered Govt. Archives

WA RGA HWS ---- Recovered Government Archive State Hazardous Waste Facilities List
WA RGA LF ---- Recovered Government Archive Solid Waste Facilities List
WA RGA LUST ---- Recovered Government Archive Leaking Underground Storage Tank

SURROUNDING SITES: SEARCH RESULTS

Surrounding sites were identified in the following databases.

Elevations have been determined from the USGS Digital Elevation Model and should be evaluated on a relative (not an absolute) basis. Relative elevation information between sites of close proximity should be field verified. Sites with an elevation equal to or higher than the target property have been differentiated below from sites with an elevation lower than the target property.
Page numbers and map identification numbers refer to the EDR Radius Map report where detailed data on individual sites can be reviewed.

Sites listed in ***bold italics*** are in multiple databases.

Unmappable (orphan) sites are not considered in the foregoing analysis.

STANDARD ENVIRONMENTAL RECORDS

Federal NPL site list

NPL: Also known as Superfund, the National Priority List database is a subset of CERCLIS and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of this database is the U.S. EPA.

A review of the NPL list, as provided by EDR, and dated 05/30/2017 has revealed that there is 1 NPL

site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SEATTLE MUNICIPAL LA	***NE OF MILITARY RD AN***	***NE 1/2 - 1 (0.879 mi.)***	***92***	***466***

Federal CERCLIS NFRAP site list

SEMS-ARCHIVE: SEMS-ARCHIVE (Superfund Enterprise Management System Archive) tracks sites that have no further interest under the Federal Superfund Program based on available information. The list was formerly known as the CERCLIS-NFRAP, renamed to SEMS ARCHIVE by the EPA in 2015. EPA may perform a minimal level of assessment work at a site while it is archived if site conditions change and/or new information becomes available. Archived sites have been removed and archived from the inventory of SEMS sites. Archived status indicates that, to the best of EPA's knowledge, assessment at a site has been completed and that EPA has determined no further steps will be taken to list the site on the National Priorities List (NPL), unless information indicates this decision was not appropriate or other considerations require a recommendation for listing at a later time. The decision does not necessarily mean that there is no hazard associated with a given site; it only means that. based upon available information, the location is not judged to be potential NPL site.

A review of the SEMS-ARCHIVE list, as provided by EDR, and dated 02/07/2017 has revealed that there are 2 SEMS-ARCHIVE sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
WIDING TRANSPORTATIO	***24300 PACIFIC HWY S***	***NNW 1/8 - 1/4 (0.139 mi.)***	***M42***	***122***
KENT NATIONAL GUARD	***24410 MILITARY ROAD***	***ENE 1/8 - 1/4 (0.237 mi.)***	***R64***	***164***

Federal RCRA generators list

RCRA-SQG: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Small quantity generators (SQGs) generate between 100 kg and 1,000 kg of hazardous waste per month.

A review of the RCRA-SQG list, as provided by EDR, and dated 12/12/2016 has revealed that there is 1 RCRA-SQG site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	24050 PACIFIC HIGHWA	N 1/8 - 1/4 (0.207 mi.)	P57	151

State- and tribal - equivalent NPL

WA HSL: The Hazardous Sites List is a subset of the CSCSL Report. It includes sites which have been assessed and ranked using the Washington Ranking Method (WARM).

A review of the WA HSL list, as provided by EDR, and dated 02/21/2017 has revealed that there are 3 WA HSL sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
NORTHWEST POWDER COA	***24453 PACIFIC HWY S***	***NW 0 - 1/8 (0.072 mi.)***	***F16***	***81***
Facility Type: Hazardous Sites List FSID Number: 2332 Facility Status: Cleanup Started				
S 252ND ST PACIFIC H	***S 252ND ST & PACIFIC***	***SW 0 - 1/8 (0.124 mi.)***	***L39***	***117***
Facility Type: Hazardous Sites List FSID Number: 2333 Facility Status: Awaiting Cleanup				
KENT HIGHLANDS LANDF	***240TH & MILITARY RD***	***NE 1/4 - 1/2 (0.386 mi.)***	***79***	***284***
Facility Type: Hazardous Sites List FSID Number: 2042 Facility Status: CC-O&M/Monitoring				

State- and tribal - equivalent CERCLIS

WA CSCSL: The State Hazardous Waste Sites records are the states' equivalent to CERCLIS. These sites may or may not already be listed on the federal CERCLIS list. Priority sites planned for cleanup using state funds (state equivalent of Superfund) are identified along with sites where cleanup will be paid for by potentially responsible parties. The data come from the Department of Ecology's Confirmed & Suspected Contaminated Sites List.

A review of the WA CSCSL list, as provided by EDR, and dated 04/18/2017 has revealed that there are 20 WA CSCSL sites within approximately 1 mile of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
OKIMOTO PROPERTY	***6500 6600 & 6800 S 2***	***NW 0 - 1/8 (0.062 mi.)***	***F11***	***78***
Site Status: Cleanup Started Facility ID: 6467151 Clean Up Siteid: 3357				
NORTHWEST POWDER COA	***24453 PACIFIC HWY S***	***NW 0 - 1/8 (0.072 mi.)***	***F16***	***81***
Site Status: Cleanup Started Facility ID: 2332 Clean Up Siteid: 1887				
B & B AIRCRAFT EQUIP	***24401 PACIFIC HWY S***	***NNW 0 - 1/8 (0.082 mi.)***	***H24***	***90***
Site Status: Cleanup Started Facility ID: 81435262 Clean Up Siteid: 10601				
MIDWAY TRANSMISSION	***25009 PACIFIC HWY SO***	***WSW 0 - 1/8 (0.112 mi.)***	***I36***	***113***
Site Status: Awaiting Cleanup Facility ID: 62592928 Clean Up Siteid: 9935				
S 252ND ST PACIFIC H	***S 252ND ST & PACIFIC***	***SW 0 - 1/8 (0.124 mi.)***	***L39***	***117***
Site Status: Awaiting Cleanup Facility ID: 2333 Clean Up Siteid: 1994				
HAUSER PROPERTY DAVI	***S 244TH & 26TH PL S***	***NW 1/8 - 1/4 (0.166 mi.)***	***N50***	***136***
Site Status: Cleanup Started Facility ID: 2413				

Clean Up Siteid: 2778

Not reported	***26TH PL S & S 244TH***	***NW 1/8 - 1/4 (0.166 mi.)***	***N51***	***137***
Site Status: Cleanup Started Facility ID: 13756895 Clean Up Siteid: 4031				
JAPANESE AUTO SALES	***24141 PACIFIC HWY S***	***NNW 1/8 - 1/4 (0.209 mi.)***	***Q60***	***158***
Site Status: Awaiting Cleanup Facility ID: 8233705 Clean Up Siteid: 3577				
KENT NATIONAL GUARD	***24410 MILITARY ROAD***	***ENE 1/8 - 1/4 (0.237 mi.)***	***R64***	***164***
Site Status: Cleanup Started Facility ID: 32645977 Clean Up Siteid: 8722 Clean Up Siteid: 4652 Clean Up Siteid: 8721				
CENTRAL MINI MART	***24526 MILITARY RD S***	***ENE 1/8 - 1/4 (0.239 mi.)***	***R67***	***232***
Site Status: Cleanup Started Facility ID: 97271853 Clean Up Siteid: 6961				
ARCO AM-PM	***24001 PACIFIC HWY S***	***N 1/4 - 1/2 (0.282 mi.)***	***71***	***247***
Site Status: Cleanup Started Facility ID: 63477446 Clean Up Siteid: 9969				
KENT CITY PUBLIC WOR	***5821 S 240TH***	***NNE 1/4 - 1/2 (0.348 mi.)***	***U76***	***262***
Site Status: Cleanup Started Facility ID: 91348131 Clean Up Siteid: 11020				
KENT HIGHLANDS LANDF	***240TH & MILITARY RD***	***NE 1/4 - 1/2 (0.386 mi.)***	***79***	***284***
Site Status: Cleanup Complete-Active O&M/Monitoring Facility ID: 2042 Clean Up Siteid: 4428				
Not reported	***2400 S 240TH ST***	***NNW 1/4 - 1/2 (0.446 mi.)***	***82***	***288***
Site Status: Cleanup Started Facility ID: 22582629 Clean Up Siteid: 8328				
Not reported	***23647 PACIFIC HWY S***	***N 1/4 - 1/2 (0.488 mi.)***	***87***	***367***
Site Status: Cleanup Started Facility ID: 91733269 Clean Up Siteid: 517				
SOUTHGATE OIL	***23428 PACIFIC HWY S***	***N 1/2 - 1 (0.620 mi.)***	***88***	***443***
Site Status: Cleanup Started Facility ID: 84946863 Clean Up Siteid: 6762				
MIDWAY SHELL	***23031 PACIFIC HWY S***	***N 1/2 - 1 (0.865 mi.)***	***91***	***459***
Site Status: Cleanup Started Facility ID: 51216788 Clean Up Siteid: 6186				

Lower Elevation	Address	Direction / Distance	Map ID	Page
7 ELEVEN STORE 18758	***26007 PACIFIC HWY S***	***SSW 1/2 - 1 (0.628 mi.)***	***89***	***450***

Site Status: Cleanup Started
Facility ID: 3847891
Clean Up Siteid: 7555

CLEANERS 1 — ***26112 PACIFIC HWY S*** — ***SSW 1/2 - 1 (0.663 mi.)*** — ***90*** — ***453***
Site Status: Cleanup Started
Facility ID: 29843481
Clean Up Siteid: 2326

JULIUS ROSSO WHOLESA — ***24202 FRAGER RD*** — ***ENE 1/2 - 1 (0.951 mi.)*** — ***93*** — ***474***
Site Status: Awaiting Cleanup
Facility ID: 3964942
Clean Up Siteid: 7559

State and tribal leaking storage tank lists

WA LUST: The Leaking Underground Storage Tank Incident Reports contain an inventory of reported leaking underground storage tank incidents. The data come from the Department of Ecology's Leaking Underground Storage Tanks Site List.

A review of the WA LUST list, as provided by EDR, has revealed that there are 7 WA LUST sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
B & B AIRCRAFT EQUIP	***24401 PACIFIC HWY S***	***NNW 0 - 1/8 (0.082 mi.)***	***H24***	***90***
Database: LUST, Date of Government Version: 05/16/2017 Facility Status: Cleanup Started Cleanup Site ID: 10601 Facility ID: 81435262				
MIDWAY TRANSMISSION	***25009 PACIFIC HWY SO***	***WSW 0 - 1/8 (0.112 mi.)***	***I36***	***113***
Database: LUST, Date of Government Version: 05/16/2017 Facility Status: Awaiting Cleanup Cleanup Site ID: 9935 Facility ID: 62592928				
KENT NATIONAL GUARD	***24410 MILITARY ROAD***	***ENE 1/8 - 1/4 (0.237 mi.)***	***R64***	***164***
Database: LUST, Date of Government Version: 05/16/2017 Facility Status: Cleanup Started Cleanup Site ID: 8722 Cleanup Site ID: 8721 Facility ID: 32645977				
CENTRAL MINI MART	***24526 MILITARY RD S***	***ENE 1/8 - 1/4 (0.239 mi.)***	***R67***	***232***
Database: LUST, Date of Government Version: 05/16/2017 Facility Status: Cleanup Started Cleanup Site ID: 6961 Facility ID: 97271853				
ARCO AM-PM	***24001 PACIFIC HWY S***	***N 1/4 - 1/2 (0.282 mi.)***	***71***	***247***
Database: LUST, Date of Government Version: 05/16/2017 Facility Status: Cleanup Started Cleanup Site ID: 9969 Facility ID: 63477446				
KENT CITY PUBLIC WOR	***5821 S 240TH***	***NNE 1/4 - 1/2 (0.348 mi.)***	***U76***	***262***
Database: LUST, Date of Government Version: 05/16/2017				

Facility Status: Cleanup Started
Cleanup Site ID: 11020
Facility ID: 91348131

Not reported ***2400 S 240TH ST*** ***NNW 1/4 - 1/2 (0.446 mi.)*** ***82*** ***288***
Database: LUST, Date of Government Version: 05/16/2017
Facility Status: Cleanup Started
Cleanup Site ID: 8328
Facility ID: 22582629

State and tribal registered storage tank lists

WA UST: The Underground Storage Tank database contains registered USTs. USTs are regulated under Subtitle I of the Resource Conservation and Recovery Act (RCRA). The data come from the Department of Ecology's Statewide UST Site/Tank Report.

A review of the WA UST list, as provided by EDR, and dated 01/31/2017 has revealed that there are 10 WA UST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported Site Id: 5507 Facility ID: 87737394	***24602 PACIFIC HWY S***	***NNW 0 - 1/8 (0.024 mi.)***	***B4***	***45***
CAR PROS INC Site Id: 2337 Facility ID: 51481626	***24432 PACIFIC HWY S***	***NNW 0 - 1/8 (0.041 mi.)***	***C7***	***72***
B & B AIRCRAFT EQUIP Site Id: 434888 Facility ID: 81435262	***24401 PACIFIC HWY S***	***NNW 0 - 1/8 (0.082 mi.)***	***H24***	***90***
MIDWAY TRANSMISSION Site Id: 409381 Facility ID: 62592928	***25009 PACIFIC HWY SO***	***WSW 0 - 1/8 (0.112 mi.)***	***I36***	***113***
WIDING TRANSPORTATIO Site Id: 10192 Facility ID: 2046	24300 PACIFIC HIGHWA	NNW 1/8 - 1/4 (0.139 mi.)	M44	126
FIRE STATION 73 OLD Site Id: 101521 Facility ID: 37895663	***3514 S 252ND***	***SE 1/8 - 1/4 (0.143 mi.)***	***J47***	***131***
LINDA HEIGHTS PUMP S Site Id: 12459 Facility ID: 2466565	***3406 S 248TH ST***	***E 1/8 - 1/4 (0.152 mi.)***	***48***	***133***
FRED MEYER FM FUEL S Site Id: 632 Facility ID: 25996862	***25250 PACIFIC HWY S***	***SW 1/8 - 1/4 (0.177 mi.)***	***O52***	***140***
ORGANIZATIONAL MAINT Site Id: 7563 Facility ID: 32645977	24410 MILITARY RD	ENE 1/8 - 1/4 (0.237 mi.)	R66	230
CENTRAL MINI MART Site Id: 200599	***24526 MILITARY RD S***	***ENE 1/8 - 1/4 (0.239 mi.)***	***R67***	***232***

EXECUTIVE SUMMARY

Facility ID: 97271853

State and tribal institutional control / engineering control registries

WA INST CONTROL: Sites that have institutional controls.

A review of the WA INST CONTROL list, as provided by EDR, and dated 04/18/2017 has revealed that there are 2 WA INST CONTROL sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
DAVIS CONSTRUCTION C Facility Site ID: 2237 CS ID: 1161	***24515 26TH PL S***	***NW 1/8 - 1/4 (0.158 mi.)***	***K49***	***134***
KENT HIGHLANDS LANDF Facility Site ID: 2042 CS ID: 4428	***240TH & MILITARY RD***	***NE 1/4 - 1/2 (0.386 mi.)***	***79***	***284***

State and tribal voluntary cleanup sites

WA ICR: These are remedial action reports Ecology has received from either the owner or operator of the site. These actions have been conducted without department oversight or approval and are not under an order or decree.

A review of the WA ICR list, as provided by EDR, and dated 12/01/2002 has revealed that there are 13 WA ICR sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MIDWAY RENTAL AND OI	24432 PACIFIC HWY S.	NNW 0 - 1/8 (0.041 mi.)	C6	71
B & B AIRCRAFT (THRE	24401 PACIFIC HWY S.	NNW 0 - 1/8 (0.071 mi.)	D13	79
MIDWAY TRANSMISSION	***25009 PACIFIC HWY SO***	***WSW 0 - 1/8 (0.112 mi.)***	***I36***	***113***
GRESHAM TRANSFER FAC	24300 PACIFIC HWY S.	NNW 1/8 - 1/4 (0.139 mi.)	M41	122
VICTORIAN PHASE II (	24512/24517 26TH PLA	NW 1/8 - 1/4 (0.140 mi.)	K45	127
GULL STATION	25250 PACIFIC HWY S.	SW 1/8 - 1/4 (0.177 mi.)	O53	143
FRED MEYER	25250 PACIFIC HWY S.	SW 1/8 - 1/4 (0.177 mi.)	O54	143
MINI MART	24429 36TH AVE. S.	ENE 1/8 - 1/4 (0.222 mi.)	R61	160
MILITARY DEPARTMENT	24410 MILITARY ROAD	ENE 1/8 - 1/4 (0.237 mi.)	R65	229
EXXON #7 7751	24718 36TH AVE. S.	E 1/4 - 1/2 (0.261 mi.)	S69	241
UNOCAL #6211	23845 PACIFIC HWY S.	N 1/4 - 1/2 (0.329 mi.)	T74	256
KENT CITY SHOP AREA	5821 S. 240TH	NNE 1/4 - 1/2 (0.348 mi.)	U77	283
FLOYD R. HUNT, INC.	3219 S. 259TH PL.	SSE 1/4 - 1/2 (0.463 mi.)	V84	366

WA VCP: Sites that have entered either the Voluntary Cleanup Program or its predecessor Independent Remedial Action Program.

A review of the WA VCP list, as provided by EDR, and dated 04/18/2017 has revealed that there are 7 WA VCP sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
GRESHAM TRANSFER INC	***24300 PACIFIC HWY S***	***NNW 1/8 - 1/4 (0.139 mi.)***	***M43***	***124***

Facility ID: 2046 Cleanup Siteid: 5052				
DAVIS CONSTRUCTION C Facility ID: 2237 Cleanup Siteid: 1161	***24515 26TH PL S***	***NW 1/8 - 1/4 (0.158 mi.)***	***K49***	***134***
Not reported Facility ID: 2218541 Cleanup Siteid: 5278	***24718 36TH AVE S***	***E 1/4 - 1/2 (0.261 mi.)***	***S70***	***244***
ARCO AM-PM Facility ID: 63477446 Cleanup Siteid: 9969	***24001 PACIFIC HWY S***	***N 1/4 - 1/2 (0.282 mi.)***	***71***	***247***
HIGHLINE CHEVRON Facility ID: 12335173 Cleanup Siteid: 5537	***23845 PACIFIC HWY S***	***N 1/4 - 1/2 (0.329 mi.)***	***T75***	***258***
Not reported Facility ID: 22582629 Cleanup Siteid: 8328	***2400 S 240TH ST***	***NNW 1/4 - 1/2 (0.446 mi.)***	***82***	***288***
Not reported Facility ID: 91733269 Cleanup Siteid: 517	***23647 PACIFIC HWY S***	***N 1/4 - 1/2 (0.488 mi.)***	***87***	***367***

State and tribal Brownfields sites

WA BROWNFIELDS: A listing of brownfields sites included in the Confirmed & Suspected Sites Listing. Brownfields are abandoned, idle or underused commercial or industrial properties, where the expansion or redevelopment is hindered by real or perceived contamination. Brownfields vary in size, location, age, and past use -- they can be anything from a five-hundred acre automobile assembly plant to a small, abandoned corner gas station.

A review of the WA BROWNFIELDS list, as provided by EDR, and dated 01/18/2017 has revealed that there is 1 WA BROWNFIELDS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
KENT NATIONAL GUARD Facilty ID: 32645977 Facility Status: Cleanup Started	***24410 MILITARY ROAD***	***ENE 1/8 - 1/4 (0.237 mi.)***	***R64***	***164***

ADDITIONAL ENVIRONMENTAL RECORDS

Local Brownfield lists

US BROWNFIELDS: The EPA's listing of Brownfields properties from the Cleanups in My Community program, which provides information on Brownfields properties for which information is reported back to EPA, as well as areas served by Brownfields grant programs.

A review of the US BROWNFIELDS list, as provided by EDR, and dated 06/19/2017 has revealed that there

is 1 US BROWNFIELDS site within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
25422 29TH AVENUE S	*25422 29TH AVENUE S*	*S 1/8 - 1/4 (0.208 mi.)*	*58*	*153*

Local Lists of Hazardous waste / Contaminated Sites

Information on facilities and sites of interest to the Department of Ecology.

A review of the WA ALLSITES list, as provided by EDR, and dated 05/05/2017 has revealed that there are 47 WA ALLSITES sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported Facility Id: 24359841 Facility Id: 17262 Facility Id: 87737394	*24602 PACIFIC HWY S*	*NNW 0 - 1/8 (0.024 mi.)*	*B5*	*46*
CAR PROS INC Facility Id: 51481626	*24432 PACIFIC HWY S*	*NNW 0 - 1/8 (0.041 mi.)*	*C7*	*72*
MIDWAY PHENYLACETIC Facility Id: 25963124	*24408 PACIFIC HWY S*	*NNW 0 - 1/8 (0.041 mi.)*	*D8*	*75*
OKIMOTO PROPERTY Facility Id: 6467151	*6500 6600 & 6800 S 2*	*NW 0 - 1/8 (0.062 mi.)*	*F11*	*78*
NORTHWEST POWDER COA Facility Id: 2332	*24453 PACIFIC HWY S*	*NW 0 - 1/8 (0.072 mi.)*	*F16*	*81*
Not reported Facility Id: 13555689	*24433 PACIFIC HWY S*	*NW 0 - 1/8 (0.074 mi.)*	*C20*	*85*
Not reported Facility Id: 29179225	*HWY 99 & S 248TH ST*	*W 0 - 1/8 (0.079 mi.)*	*E23*	*88*
B & B AIRCRAFT EQUIP Facility Id: 81435262	*24401 PACIFIC HWY S*	*NNW 0 - 1/8 (0.082 mi.)*	*H24*	*90*
C-DORY INC Facility Id: 99252698	*25028 PACIFIC HWY S*	*SW 0 - 1/8 (0.084 mi.)*	*I25*	*94*
RS COLOR DESIGN INC Facility Id: 63721985	*25026 PACIFIC HWY S*	*SW 0 - 1/8 (0.087 mi.)*	*I27*	*98*
RS COLOR & DESIGN IN Facility Id: 43634123	*25015 PACIFIC HWY S*	*WSW 0 - 1/8 (0.093 mi.)*	*G28*	*100*
PANADERIA LA GUADALU Facility Id: 1589542	*24811 PACIFIC HWY S*	*WSW 0 - 1/8 (0.095 mi.)*	*G30*	*109*
SIGNMAKERS INC Facility Id: 67149364	*25017 PACIFIC HWY S*	*WSW 0 - 1/8 (0.102 mi.)*	*I33*	*111*
MIDWAY TRANSMISSION Facility Id: 62592928	*25009 PACIFIC HWY SO*	*WSW 0 - 1/8 (0.112 mi.)*	*I36*	*113*
S 252ND ST PACIFIC H Facility Id: 2333	*S 252ND ST & PACIFIC*	*SW 0 - 1/8 (0.124 mi.)*	*L39*	*117*
SEA TAC TRANSMISSION Facility Id: 86812338	*2628 S 248TH ST*	*W 1/8 - 1/4 (0.130 mi.)*	*40*	*119*
GRESHAM TRANSFER INC	*24300 PACIFIC HWY S*	*NNW 1/8 - 1/4 (0.139 mi.)*	*M43*	*124*

Facility Id: 2046				
REDONDO 1 HR CLEANER Facility Id: 67528781	***27203 PACIFIC HWY S***	***SW 1/8 - 1/4 (0.142 mi.)***	***L46***	***127***
FIRE STATION 73 OLD Facility Id: 37895663	***3514 S 252ND***	***SE 1/8 - 1/4 (0.143 mi.)***	***J47***	***131***
LINDA HEIGHTS PUMP S Facility Id: 2466565	***3406 S 248TH ST***	***E 1/8 - 1/4 (0.152 mi.)***	***48***	***133***
DAVIS CONSTRUCTION C Facility Id: 2237	***24515 26TH PL S***	***NW 1/8 - 1/4 (0.158 mi.)***	***K49***	***134***
HAUSER PROPERTY DAVI Facility Id: 2413	***S 244TH & 26TH PL S***	***NW 1/8 - 1/4 (0.166 mi.)***	***N50***	***136***
Not reported Facility Id: 13756895	***26TH PL S & S 244TH***	***NW 1/8 - 1/4 (0.166 mi.)***	***N51***	***137***
FRED MEYER FM FUEL S Facility Id: 25996862	***25250 PACIFIC HWY S***	***SW 1/8 - 1/4 (0.177 mi.)***	***O52***	***140***
SEA MAR HEALTH CENTE Facility Id: 11034	***24215 PACIFIC HWY S***	***NNW 1/8 - 1/4 (0.178 mi.)***	***M55***	***144***
LOWES OF KENT MIDWAY Facility Id: 131472	***24050 PACIFIC HIGHWA***	***N 1/8 - 1/4 (0.207 mi.)***	***P56***	***146***
JAPANESE AUTO SALES Facility Id: 8233705	***24141 PACIFIC HWY S***	***NNW 1/8 - 1/4 (0.209 mi.)***	***Q60***	***158***
HARVEYS SKIN DIVING Facility Id: 9451754	***2505 S 252ND ST***	***SW 1/8 - 1/4 (0.225 mi.)***	***62***	***161***
PARKSIDE PARK Facility Id: 16968	***2518 SOUTH 244TH STR***	***NW 1/8 - 1/4 (0.231 mi.)***	***63***	***163***
KENT NATIONAL GUARD Facility Id: 32645977	***24410 MILITARY ROAD***	***ENE 1/8 - 1/4 (0.237 mi.)***	***R64***	***164***
CENTRAL MINI MART Facility Id: 97271853	***24526 MILITARY RD S***	***ENE 1/8 - 1/4 (0.239 mi.)***	***R67***	***232***
Not reported Facility Id: 12953524	***25440 PACIFIC HWY S***	***SSW 1/4 - 1/2 (0.252 mi.)***	***68***	***237***
Not reported Facility Id: 2218541	***24718 36TH AVE S***	***E 1/4 - 1/2 (0.261 mi.)***	***S70***	***244***
ARCO AM-PM Facility Id: 63477446	***24001 PACIFIC HWY S***	***N 1/4 - 1/2 (0.282 mi.)***	***71***	***247***
KENT CORROSIVE Facility Id: 64598774	***2630 S 256TH ST***	***SSW 1/4 - 1/2 (0.298 mi.)***	***72***	***252***
MIDWAY MUFFLER & RAD Facility Id: 20974185	***23898 PACIFIC HWY S***	***N 1/4 - 1/2 (0.328 mi.)***	***T73***	***254***
HIGHLINE CHEVRON Facility Id: 12335173	***23845 PACIFIC HWY S***	***N 1/4 - 1/2 (0.329 mi.)***	***T75***	***258***
KENT CITY PUBLIC WOR Facility Id: 91348131	***5821 S 240TH***	***NNE 1/4 - 1/2 (0.348 mi.)***	***U76***	***262***
KENT CITY PARKS DEPT Facility Id: 38859759	***5821 S 240TH E END O***	***NNE 1/4 - 1/2 (0.348 mi.)***	***U78***	***283***
KENT HIGHLANDS LANDF	***240TH & MILITARY RD***	***NE 1/4 - 1/2 (0.386 mi.)***	***79***	***284***

Facility Id: 2042				
Not reported Facility Id: 2867811	***25619 PACIFIC HWY S***	***SW 1/4 - 1/2 (0.422 mi.)***	***80***	***286***
Not reported Facility Id: 22582629	***2400 S 240TH ST***	***NNW 1/4 - 1/2 (0.446 mi.)***	***82***	***288***
Not reported Facility Id: 9459654	***25802 PACIFIC HWY S***	***SSW 1/4 - 1/2 (0.459 mi.)***	***83***	***358***
FLOYD R HUNT INC Facility Id: 2241	***3219 S 259TH PL***	***SSE 1/4 - 1/2 (0.463 mi.)***	***V85***	***366***
SUNNYCREST ELEMENTAR Facility Id: 14186	24629 42ND AVE S	E 1/4 - 1/2 (0.475 mi.)	86	367
Not reported Facility Id: 91733269	***23647 PACIFIC HWY S***	***N 1/4 - 1/2 (0.488 mi.)***	***87***	***367***

Lower Elevation	Address	Direction / Distance	Map ID	Page
PARKSIDE ELEMENTARY Facility Id: 8366	2104 S 247TH ST	WNW 1/4 - 1/2 (0.438 mi.)	81	288

WA CSCSL NFA: The data set contains information about sites previously on the Confirmed and Suspected Contaminated Sites list that have received a No Further Action (NFA) determination. Because it is necessary to maintain historical records of sites that have been investigated and cleaned up, sites are not deleted from the database when cleanup activities are completed. Instead a No Further Action code is entered based upon the type of NFA determination the site received.

A review of the WA CSCSL NFA list, as provided by EDR, and dated 04/18/2017 has revealed that there are 7 WA CSCSL NFA sites within approximately 0.5 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
CAR PROS INC Facility/Site Id: 51481626 CS Id: 9499	***24432 PACIFIC HWY S***	***NNW 0 - 1/8 (0.041 mi.)***	***C7***	***72***
GRESHAM TRANSFER INC Facility/Site Id: 2046 CS Id: 5052	***24300 PACIFIC HWY S***	***NNW 1/8 - 1/4 (0.139 mi.)***	***M43***	***124***
DAVIS CONSTRUCTION C Facility/Site Id: 2237 CS Id: 1161	***24515 26TH PL S***	***NW 1/8 - 1/4 (0.158 mi.)***	***K49***	***134***
FRED MEYER FM FUEL S Facility/Site Id: 25996862 CS Id: 8503 CS Id: 8502	***25250 PACIFIC HWY S***	***SW 1/8 - 1/4 (0.177 mi.)***	***O52***	***140***
Not reported Facility/Site Id: 2218541 CS Id: 5278	***24718 36TH AVE S***	***E 1/4 - 1/2 (0.261 mi.)***	***S70***	***244***
HIGHLINE CHEVRON Facility/Site Id: 12335173 CS Id: 5537	***23845 PACIFIC HWY S***	***N 1/4 - 1/2 (0.329 mi.)***	***T75***	***258***
FLOYD R HUNT INC	***3219 S 259TH PL***	***SSE 1/4 - 1/2 (0.463 mi.)***	***V85***	***366***

EXECUTIVE SUMMARY

Facility/Site Id: 2241
CS Id: 1945

Other Ascertainable Records

RCRA NonGen / NLR: RCRAInfo is EPA's comprehensive information system, providing access to data supporting the Resource Conservation and Recovery Act (RCRA) of 1976 and the Hazardous and Solid Waste Amendments (HSWA) of 1984. The database includes selective information on sites which generate, transport, store, treat and/or dispose of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). Non-Generators do not presently generate hazardous waste.

A review of the RCRA NonGen / NLR list, as provided by EDR, and dated 12/12/2016 has revealed that there are 18 RCRA NonGen / NLR sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	***24602 PACIFIC HWY S***	***NNW 0 - 1/8 (0.024 mi.)***	***B4***	***45***
Not reported	***24602 PACIFIC HWY S***	***NNW 0 - 1/8 (0.024 mi.)***	***B5***	***46***
CAR PROS INC	***24432 PACIFIC HWY S***	***NNW 0 - 1/8 (0.041 mi.)***	***C7***	***72***
MIDWAY PHENYLACETIC	***24408 PACIFIC HWY S***	***NNW 0 - 1/8 (0.041 mi.)***	***D8***	***75***
Not reported	***24433 PACIFIC HWY S***	***NW 0 - 1/8 (0.074 mi.)***	***C20***	***85***
Not reported	***HWY 99 & S 248TH ST***	***W 0 - 1/8 (0.079 mi.)***	***E23***	***88***
B & B AIRCRAFT EQUIP	***24401 PACIFIC HWY S***	***NNW 0 - 1/8 (0.082 mi.)***	***H24***	***90***
C-DORY INC	***25028 PACIFIC HWY S***	***SW 0 - 1/8 (0.084 mi.)***	***I25***	***94***
RS COLOR DESIGN INC	***25026 PACIFIC HWY S***	***SW 0 - 1/8 (0.087 mi.)***	***I27***	***98***
RS COLOR & DESIGN IN	***25015 PACIFIC HWY S***	***WSW 0 - 1/8 (0.093 mi.)***	***G28***	***100***
SIGNMAKERS INC	***25017 PACIFIC HWY S***	***WSW 0 - 1/8 (0.102 mi.)***	***I33***	***111***
SEA TAC TRANSMISSION	***2628 S 248TH ST***	***W 1/8 - 1/4 (0.130 mi.)***	***40***	***119***
WIDING TRANSPORTATIO	***24300 PACIFIC HWY S***	***NNW 1/8 - 1/4 (0.139 mi.)***	***M42***	***122***
REDONDO 1 HR CLEANER	***27203 PACIFIC HWY S***	***SW 1/8 - 1/4 (0.142 mi.)***	***L46***	***127***
Not reported	***26TH PL S & S 244TH***	***NW 1/8 - 1/4 (0.166 mi.)***	***N51***	***137***
Not reported	24141 PACIFIC HWY S	NNW 1/8 - 1/4 (0.209 mi.)	Q59	156
HARVEYS SKIN DIVING	***2505 S 252ND ST***	***SW 1/8 - 1/4 (0.225 mi.)***	***62***	***161***
KENT NATIONAL GUARD	***24410 MILITARY ROAD***	***ENE 1/8 - 1/4 (0.237 mi.)***	***R64***	***164***

ROD: Record of Decision. ROD documents mandate a permanent remedy at an NPL (Superfund) site containing technical and health information to aid the cleanup.

A review of the ROD list, as provided by EDR, and dated 11/25/2013 has revealed that there is 1 ROD site within approximately 1 mile of the target property.

Lower Elevation	Address	Direction / Distance	Map ID	Page
SEATTLE MUNICIPAL LA	***NE OF MILITARY RD AN***	***NE 1/2 - 1 (0.879 mi.)***	***92***	***466***

WA Inactive Drycleaners: A listing of inactive drycleaner facility locations.

A review of the WA Inactive Drycleaners list, as provided by EDR, and dated 04/18/2017 has revealed that there is 1 WA Inactive Drycleaners site within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
REDONDO 1 HR CLEANER	***27203 PACIFIC HWY S***	***SW 1/8 - 1/4 (0.142 mi.)***	***L46***	***127***
EPA I: WA0000712950				
Facility ID: 7685				

WA MANIFEST: Hazardous waste manifest information.

A review of the WA MANIFEST list, as provided by EDR, and dated 12/31/2016 has revealed that there are 4 WA MANIFEST sites within approximately 0.25 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
Not reported	***24602 PACIFIC HWY S***	***NNW 0 - 1/8 (0.024 mi.)***	***B5***	***46***
Facility Site ID Number: 24359841				
Gen Status CD: LQG				
EPA ID: WAD982653909				
RS COLOR & DESIGN IN	***25015 PACIFIC HWY S***	***WSW 0 - 1/8 (0.093 mi.)***	***G28***	***100***
Facility Site ID Number: 43634123				
Gen Status CD: SQG				
EPA ID: WAD982653750				
LOWES OF KENT MIDWAY	***24050 PACIFIC HIGHWA***	***N 1/8 - 1/4 (0.207 mi.)***	***P56***	***146***
Facility Site ID Number: 131472				
Gen Status CD: MQG				
EPA ID: WAH000050713				
KENT NATIONAL GUARD	***24410 MILITARY ROAD***	***ENE 1/8 - 1/4 (0.237 mi.)***	***R64***	***164***
Facility Site ID Number: 32645977				
Gen Status CD: XQG				
Gen Status CD: MQG				
Gen Status CD: SQG				
EPA ID: WA0211890041				

EDR HIGH RISK HISTORICAL RECORDS

EDR Exclusive Records

EDR Hist Auto: EDR has searched selected national collections of business directories and has collected listings of potential gas station/filling station/service station sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include gas station/filling station/service station establishments. The categories reviewed included, but were not limited to gas, gas station, gasoline station, filling station, auto, automobile repair, auto service station, service station, etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Auto list, as provided by EDR, has revealed that there are 17 EDR Hist Auto sites within approximately 0.125 miles of the target property.

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
ROCK AUTOMOTIVE	2824 S 252ND ST	SSW 0 - 1/8 (0.008 mi.)	3	44

EXECUTIVE SUMMARY

Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
AUTOMOTIVE MARKETING	24806 S PACIFIC HWY	W 0 - 1/8 (0.052 mi.)	E9	77
ELECTRIC POWER TOOL	24611 PACIFIC HWY S	NW 0 - 1/8 (0.057 mi.)	F10	78
SEA TAC TRANSMISSION	24805 S PACIFIC HWY	W 0 - 1/8 (0.072 mi.)	E14	80
UNITED STTES AMER QL	24453 PACIFIC HWY S	NW 0 - 1/8 (0.072 mi.)	F15	81
MIDNITE MART INC	24645 PACIFIC HWY S	WNW 0 - 1/8 (0.073 mi.)	18	84
SKIPS AUTO REBUILD	24441 S PACIFIC HWY	NW 0 - 1/8 (0.073 mi.)	C19	84
SEA-TAC TRANSMISSION	24433 PACIFIC HWY S	NW 0 - 1/8 (0.074 mi.)	C21	87
ROYAL PUYALLUP INC	25006 PACIFIC HWY S	WSW 0 - 1/8 (0.076 mi.)	G22	88
ROCK AUTOMOTIVE	25026 PACIFIC HWY S	SW 0 - 1/8 (0.087 mi.)	I26	98
SCOOTERS PERFORMANCE	24811 PACIFIC HWY S	WSW 0 - 1/8 (0.095 mi.)	G29	109
AMERICAN TIRE & EQUI	24401 PACIFIC HWY S	NNW 0 - 1/8 (0.096 mi.)	H31	110
GAMBOLD JOHN D & SUE	3304 S 251ST PLACE	SE 0 - 1/8 (0.101 mi.)	J32	110
GLASS REPLACEMENT CE	25045 PACIFIC HWY S	WSW 0 - 1/8 (0.105 mi.)	I34	112
MIDWAY FRAME AND WHE	25013 S PACIFIC HWY	WSW 0 - 1/8 (0.109 mi.)	I35	113
MIDWAY TRANSMISSION	25009 S PACIFIC HWY	WSW 0 - 1/8 (0.112 mi.)	I37	116
TAM DANT	24520 26TH PL S	NW 0 - 1/8 (0.122 mi.)	K38	117

EDR Hist Cleaner: EDR has searched selected national collections of business directories and has collected listings of potential dry cleaner sites that were available to EDR researchers. EDR's review was limited to those categories of sources that might, in EDR's opinion, include dry cleaning establishments. The categories reviewed included, but were not limited to dry cleaners, cleaners, laundry, laundromat, cleaning/laundry, wash & dry etc. This database falls within a category of information EDR classifies as "High Risk Historical Records", or HRHR. EDR's HRHR effort presents unique and sometimes proprietary data about past sites and operations that typically create environmental concerns, but may not show up in current government records searches.

A review of the EDR Hist Cleaner list, as provided by EDR, has revealed that there are 2 EDR Hist Cleaner sites within approximately 0.125 miles of the target property.

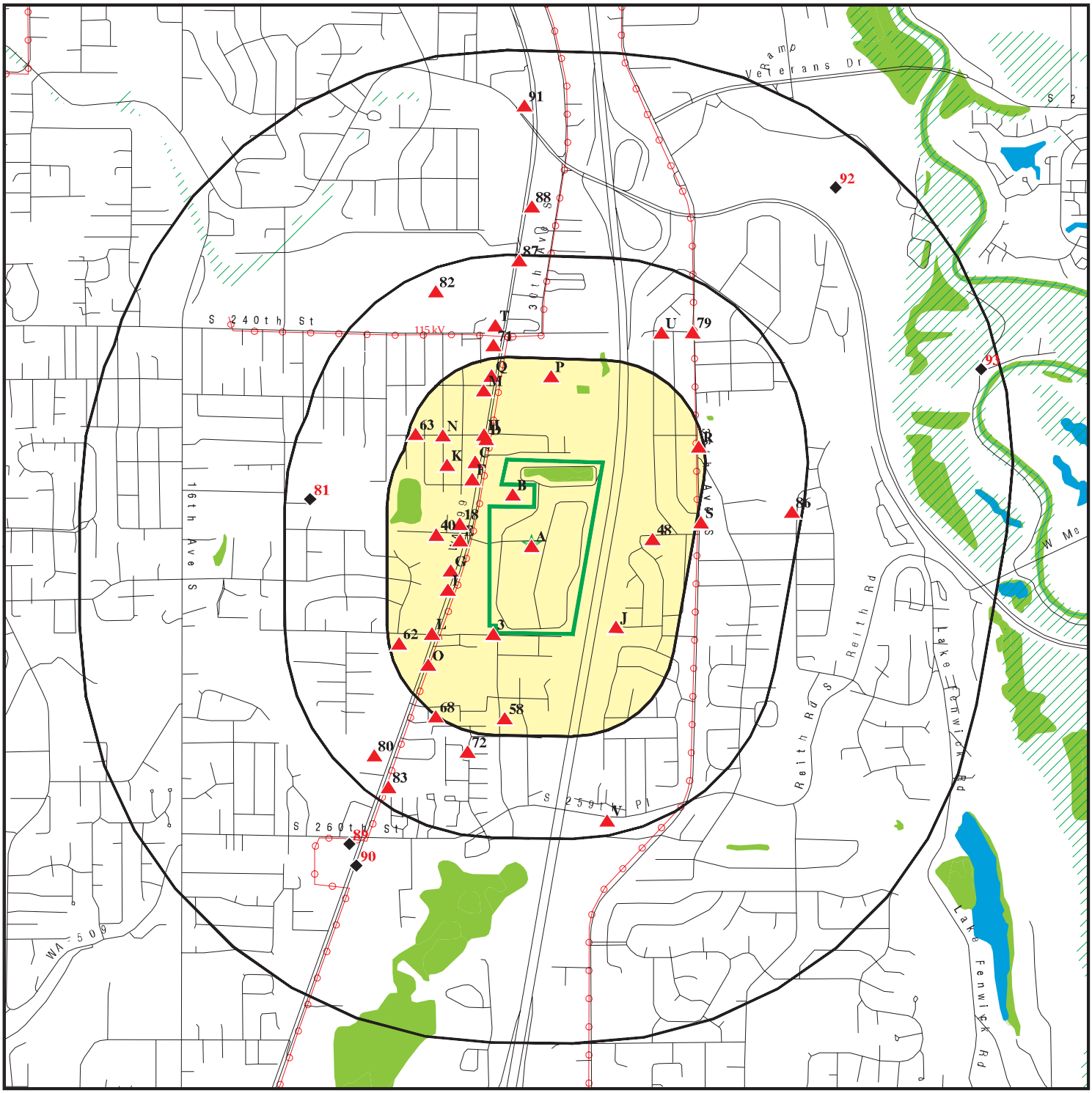
Equal/Higher Elevation	Address	Direction / Distance	Map ID	Page
MIDWAY CLASSIC CLEAN	24860 PACIFIC HWY S	WSW 0 - 1/8 (0.067 mi.)	G12	79
CHO KEE	24453 PACIFIC HWY S	NW 0 - 1/8 (0.072 mi.)	F17	84

EXECUTIVE SUMMARY

Due to poor or inadequate address information, the following sites were not mapped. Count: 5 records.

Site Name	Database(s)
NIKE S-43 MIDWAY	SEMS-ARCHIVE
JUDKINS STREET DISPOSAL SITE	WA SWF/LF
OLYMPIC PIPELINE COMPANY - KENT BL	WA ICR
MIDWAY UNOCAL 76	EDR Hist Auto
CIRCLE K 1546	WA VCP

OVERVIEW MAP - 5052930.2S

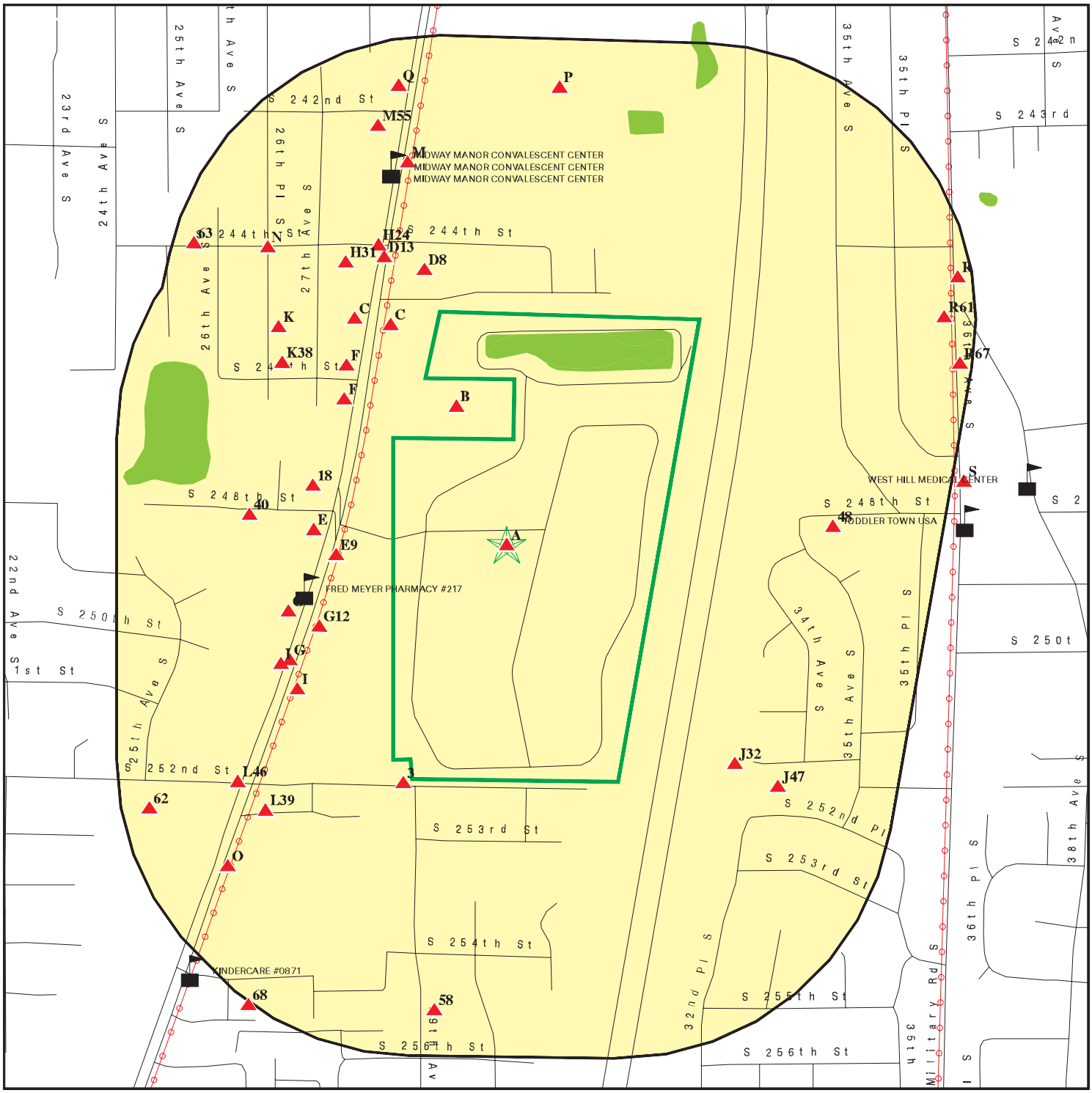


- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands
- Upgradient Area

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME: Midway Landfill	CLIENT: EHS International, Inc.
ADDRESS: 24800 Pacific Highway S Kent WA 98032	CONTACT: Michael Brady
LAT/LONG: 47.379007 / 122.295019	INQUIRY #: 5052930.2s DATE: September 18, 2017 8:15 pm

DETAIL MAP - 5052930.2S



- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Manufactured Gas Plants
- Sensitive Receptors
- National Priority List Sites
- Dept. Defense Sites
- Indian Reservations BIA
- Power transmission lines
- 100-year flood zone
- 500-year flood zone
- National Wetland Inventory
- State Wetlands

This report includes Interactive Map Layers to display and/or hide map information. The legend includes only those icons for the default map view.

SITE NAME:	Midway Landfill	CLIENT:	EHS International, Inc.
ADDRESS:	24800 Pacific Highway S Kent WA 98032	CONTACT:	Michael Brady
LAT/LONG:	47.379007 / 122.295019	INQUIRY #:	5052930.2s
		DATE:	September 18, 2017 9:03 pm

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
STANDARD ENVIRONMENTAL RECORDS								
Federal NPL site list								
NPL	1.000	1	0	0	0	1	NR	2
Proposed NPL	1.000		0	0	0	0	NR	0
NPL LIENS	0.001		0	NR	NR	NR	NR	0
Federal Delisted NPL site list								
Delisted NPL	1.000		0	0	0	0	NR	0
Federal CERCLIS list								
FEDERAL FACILITY	0.500		0	0	0	NR	NR	0
SEMS	0.500	1	0	0	0	NR	NR	1
Federal CERCLIS NFRAP site list								
SEMS-ARCHIVE	0.500		0	2	0	NR	NR	2
Federal RCRA CORRACTS facilities list								
CORRACTS	1.000		0	0	0	0	NR	0
Federal RCRA non-CORRACTS TSD facilities list								
RCRA-TSDF	0.500		0	0	0	NR	NR	0
Federal RCRA generators list								
RCRA-LQG	0.250		0	0	NR	NR	NR	0
RCRA-SQG	0.250		0	1	NR	NR	NR	1
RCRA-CESQG	0.250		0	0	NR	NR	NR	0
Federal institutional controls / engineering controls registries								
LUCIS	0.500		0	0	0	NR	NR	0
US ENG CONTROLS	0.500	1	0	0	0	NR	NR	1
US INST CONTROL	0.500	1	0	0	0	NR	NR	1
Federal ERNS list								
ERNS	0.001		0	NR	NR	NR	NR	0
State- and tribal - equivalent NPL								
WA HSL	1.000	1	2	0	1	0	NR	4
State- and tribal - equivalent CERCLIS								
WA CSCSL	1.000	1	5	5	5	5	NR	21
State and tribal landfill and/or solid waste disposal site lists								
WA SWF/LF	0.500		0	0	0	NR	NR	0
State and tribal leaking storage tank lists								
WA LUST	0.500		2	2	3	NR	NR	7

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
INDIAN LUST	0.500		0	0	0	NR	NR	0
State and tribal registered storage tank lists								
FEMA UST	0.250		0	0	NR	NR	NR	0
WA UST	0.250		4	6	NR	NR	NR	10
WA AST	0.250		0	0	NR	NR	NR	0
INDIAN UST	0.250		0	0	NR	NR	NR	0
State and tribal institutional control / engineering control registries								
WA INST CONTROL	0.500		0	1	1	NR	NR	2
State and tribal voluntary cleanup sites								
WA ICR	0.500		3	6	4	NR	NR	13
WA VCP	0.500		0	2	5	NR	NR	7
INDIAN VCP	0.500		0	0	0	NR	NR	0
State and tribal Brownfields sites								
WA BROWNFIELDS	0.500		0	1	0	NR	NR	1
ADDITIONAL ENVIRONMENTAL RECORDS								
Local Brownfield lists								
US BROWNFIELDS	0.500		0	1	0	NR	NR	1
Local Lists of Landfill / Solid Waste Disposal Sites								
WA SWRCY	0.500		0	0	0	NR	NR	0
WA SWTIRE	0.500		0	0	0	NR	NR	0
INDIAN ODI	0.500		0	0	0	NR	NR	0
ODI	0.500		0	0	0	NR	NR	0
DEBRIS REGION 9	0.500		0	0	0	NR	NR	0
IHS OPEN DUMPS	0.500		0	0	0	NR	NR	0
Local Lists of Hazardous waste / Contaminated Sites								
US HIST CDL	0.001		0	NR	NR	NR	NR	0
WA ALLSITES	0.500	1	15	16	16	NR	NR	48
WA CDL	0.001		0	NR	NR	NR	NR	0
WA HIST CDL	0.001		0	NR	NR	NR	NR	0
WA CSCSL NFA	0.500		1	3	3	NR	NR	7
US CDL	0.001		0	NR	NR	NR	NR	0
Local Land Records								
LIENS 2	0.001		0	NR	NR	NR	NR	0
Records of Emergency Release Reports								
HMIRS	0.001		0	NR	NR	NR	NR	0
WA SPILLS	0.001		0	NR	NR	NR	NR	0
WA SPILLS 90	0.001		0	NR	NR	NR	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
Other Ascertainable Records								
RCRA NonGen / NLR	0.250	1	11	7	NR	NR	NR	19
FUDS	1.000		0	0	0	0	NR	0
DOD	1.000		0	0	0	0	NR	0
SCRD DRYCLEANERS	0.500		0	0	0	NR	NR	0
US FIN ASSUR	0.001		0	NR	NR	NR	NR	0
EPA WATCH LIST	0.001		0	NR	NR	NR	NR	0
2020 COR ACTION	0.250		0	0	NR	NR	NR	0
TSCA	0.001		0	NR	NR	NR	NR	0
TRIS	0.001		0	NR	NR	NR	NR	0
SSTS	0.001		0	NR	NR	NR	NR	0
ROD	1.000	1	0	0	0	1	NR	2
RMP	0.001		0	NR	NR	NR	NR	0
RAATS	0.001		0	NR	NR	NR	NR	0
PRP	0.001		0	NR	NR	NR	NR	0
PADS	0.001		0	NR	NR	NR	NR	0
ICIS	0.001		0	NR	NR	NR	NR	0
FTTS	0.001		0	NR	NR	NR	NR	0
MLTS	0.001		0	NR	NR	NR	NR	0
COAL ASH DOE	0.001		0	NR	NR	NR	NR	0
COAL ASH EPA	0.500		0	0	0	NR	NR	0
PCB TRANSFORMER	0.001		0	NR	NR	NR	NR	0
RADINFO	0.001		0	NR	NR	NR	NR	0
HIST FTTS	0.001		0	NR	NR	NR	NR	0
DOT OPS	0.001		0	NR	NR	NR	NR	0
CONSENT	1.000		0	0	0	0	NR	0
INDIAN RESERV	0.001		0	NR	NR	NR	NR	0
FUSRAP	1.000		0	0	0	0	NR	0
UMTRA	0.500		0	0	0	NR	NR	0
LEAD SMELTERS	0.001		0	NR	NR	NR	NR	0
US AIRS	0.001		0	NR	NR	NR	NR	0
US MINES	0.250		0	0	NR	NR	NR	0
ABANDONED MINES	0.001		0	NR	NR	NR	NR	0
FINDS	0.001	2	0	NR	NR	NR	NR	2
UXO	1.000		0	0	0	0	NR	0
DOCKET HWC	0.001		0	NR	NR	NR	NR	0
ECHO	0.001	1	0	NR	NR	NR	NR	1
FUELS PROGRAM	0.250		0	0	NR	NR	NR	0
WA AIRS	0.001		0	NR	NR	NR	NR	0
WA ASBESTOS	TP		NR	NR	NR	NR	NR	0
WA COAL ASH	0.500		0	0	0	NR	NR	0
WA DRYCLEANERS	0.250		0	0	NR	NR	NR	0
WA Financial Assurance	0.001		0	NR	NR	NR	NR	0
CA HAZNET	TP		NR	NR	NR	NR	NR	0
WA Inactive Drycleaners	0.250		0	1	NR	NR	NR	1
WA MANIFEST	0.250	1	2	2	NR	NR	NR	5
WA NPDES	0.001		0	NR	NR	NR	NR	0
WA UIC	0.001		0	NR	NR	NR	NR	0
EDR HIGH RISK HISTORICAL RECORDS								
EDR Exclusive Records								
EDR MGP	1.000		0	0	0	0	NR	0

MAP FINDINGS SUMMARY

Database	Search Distance (Miles)	Target Property	< 1/8	1/8 - 1/4	1/4 - 1/2	1/2 - 1	> 1	Total Plotted
EDR Hist Auto	0.125		17	NR	NR	NR	NR	17
EDR Hist Cleaner	0.125		2	NR	NR	NR	NR	2
EDR RECOVERED GOVERNMENT ARCHIVES								
Exclusive Recovered Govt. Archives								
WA RGA HWS	0.001		0	NR	NR	NR	NR	0
WA RGA LF	0.001		0	NR	NR	NR	NR	0
WA RGA LUST	0.001		0	NR	NR	NR	NR	0
- Totals --		13	64	56	38	7	0	178

NOTES:

TP = Target Property

NR = Not Requested at this Search Distance

Sites may be listed in more than one database

Map Findings (pages 8 - 477), Orphan Summary (page 478), and Government Records Searched/ Data Currency Testing (pages GR-1 - GR-27) are available upon request

Appendix D

1988 Well Inventory

APPENDIX C

WATER WELL INVENTORY
TECHNICAL MEMORANDUM
MIDWAY LANDFILL REMEDIAL INVESTIGAITON

Prepared for:

SEATTLE ENGINEERING DEPARTMENT
SOLID WASTE UTILITY

Prepared by:

PARAMETRIX, INC.
13020 Northup Way, Suite 8
Bellevue, Washington 98005

June 1988
PMX #55-1550-11 (Task 2.2.6)

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1.0 INTRODUCTION

As part of the Midway Landfill Remedial Investigation, an inventory was taken of private and public water wells in the vicinity of the landfill.

The specific objectives of this task were to:

- Review the existing water well inventory given in Appendix N of the Final Environmental Impact Statement, Midway Landfill Closure Plan, Parametrix, Inc., May, 1986.
- Inventory all water wells within a one-mile radius of the Midway Landfill.
- Plot public and private water wells within a one-mile radius on a map of the area.
- Delineate the service areas for water utilities by mapping the water utility boundaries.

2.0 METHODOLOGY

Appendix N of the Final Environmental Impact Statement for the Midway Landfill Closure Plan (Parametrix, Inc., May 1986), the Beneficial Use for Groundwater Survey, inventoried private wells within a one-mile radius and public wells within a five-mile radius of the landfill. Forty-four wells were found; 33 (12 private and 21 public) were field-verified or verified by the owner/user.

The list of wells was compiled by reviewing agency files from:

- Seattle-King County Health Department
- Washington State Department of Ecology
- Washington State Department of Social and Health Services
- U.S.G.S. Groundwater Survey

In addition, a questionnaire was sent to 90 homeowners in neighborhoods near the landfill, selected on the basis of a groundwater survey conducted by the USGS in the early 1960s (Luzier, 1969) that identified wells in the area at that time.

For the Remedial Investigation, information on additional wells in the landfill vicinity was obtained by examining water well logs kept on file in

the Redmond office of the Department of Ecology, and by interviewing the following individuals:

Department of Ecology, Olympia
Dan Swenson

City of Kent
Don Wikstrom
Brian Church
Gary Gill

King County Water District # 75
Duane Husky

3.0 RESULTS

During the RI, three private wells and five public wells not previously listed were identified within a one-mile radius of the Midway Landfill.

Table 4.1 summarizes the information obtained from both studies on the 31 wells within a one-mile radius of the site. Figure 4.1 shows the locations of these wells and the service area boundaries of the local water utilities.

Twenty-two of these wells are unused, and of these, only 10 are known to be operable. Five wells, all in the Lake Fenwick area to the southeast of the landfill, are known to be in use for domestic water. Three others are used for irrigation but not for drinking water. Another is to be put into use for irrigation.

0451

Table 4.1 Public and private wells within one mile of the Midway Landfill. (Page 1 of 4)

Well #	Owner/Property Address	Location	Well Depth (ft)	Depth to Water (ft)	Present Use	Condition
1	W. Sharick 26605 Lake Fenwick Rd. Kent, WA	T22N R4E Sec. 27 1/4NW 1/4NE	137	79	Private (1 home)	Operating
2	G. Salter 26416 Lake Fenwick Rd. Kent, WA	T22N R4E Sec. 27 1/4SE 1/4NE	39	17	Private (1 home)	Operating
3	J. Flewellings 26724 51st Pl. S. Kent, WA	T22N R4E Sec. 27 1/3SE 1/4NE	30	6	Domestic (1 home)	Operating
5	Hayett Water System 26612 Lake Fenwick Rd. Kent, WA	T22N R4E Sec. 27 1/4NE 1/4SE	84	43	Private (2 homes)	Operating
6	Lake Fenwick Supply 26425 Lake Fenwick Rd. Kent, WA	T22N R4E Sec. 27 1/4SE 1/4NE	165		Private (9 homes)	Operating
11A	E. Stoner 24135 21st Ave. S. Kent, WA	T22N R4E Sec. 21 1/3NE 1/4NW	36 (Dug)	9	Unused	Covered Operable
11B	E. Sahee 24131 21st Ave. S. Kent, WA	T22N R4E Sec. 21 1/4NE 1/4NW	(Dug)		Unused	Capped & filled
12	John Muller 25401 16th Pl. S. Kent, WA	T22N R4E Sec. 21 1/4SW 1/4SW	125	3	Unused	Capped & inoperable
13	C.E. Kraft 4436 Reith Rd. Kent, WA	T22N R4E Sec. 22 1/4SW 1/4SE	160	50	Not used for drinking water	Operating

Table 4.1 (Continued. Page 2 of 4)

Well #	Owner/Property Address	Location	Well Depth (ft)	Depth to Water (ft)	Present Use	Condition
15	L. Huddleston 25643 Lake Fenwick Rd. Kent, WA	T22N R4E Sec. 27 1/4NE 1/4NE	120		Unused	Operable
16	L. Sandelius 25616 Lake Fenwick Rd. Kent, WA	T22N R4E Sec. 27 1/4NE 1/4NE	153	121	Unused	Pump removed. Capped
19	M. Meeker 1620 S. 257th Pl. Kent, WA	T22N R4E Sec. 28 1/4NW 1/4NW	27	3	Lawn Care	Operating
20	L. Jacobs 1847 S. 260th Kent, WA	T22N R4E Sec. 28 1/4SW 1/4NW	265	57	Unused	Pump inoperative. Not capped
22	A. Rost 2635 S. 260th Kent, WA	T22N R4E Sec. 28 1/4SW 1/4NE	27	9	Unused	Covered Operable
25	Wilcox 26601 Pacific Hwy. S. Kent, WA	T22N R4E Sec. 28 1/4NE 1/4SW	96	35	Unused	Covered, filled
26	Graham 26631 Pacific Hwy. S. Kent, WA	T22N R4E Sec. 28 1/4NE 1/4SW	30		Unused	Operable
28	Hedin 26632 Pacific Hwy. S. Kent, WA	T22N R4E Sec. 28	11	4	Unused	Covered Operable
31A	McGee 26645 16th Ave. S. Kent, WA	T22N R4E Sec. 29 1/4NE 1/4SE	45	32	Unused	Covered Operable

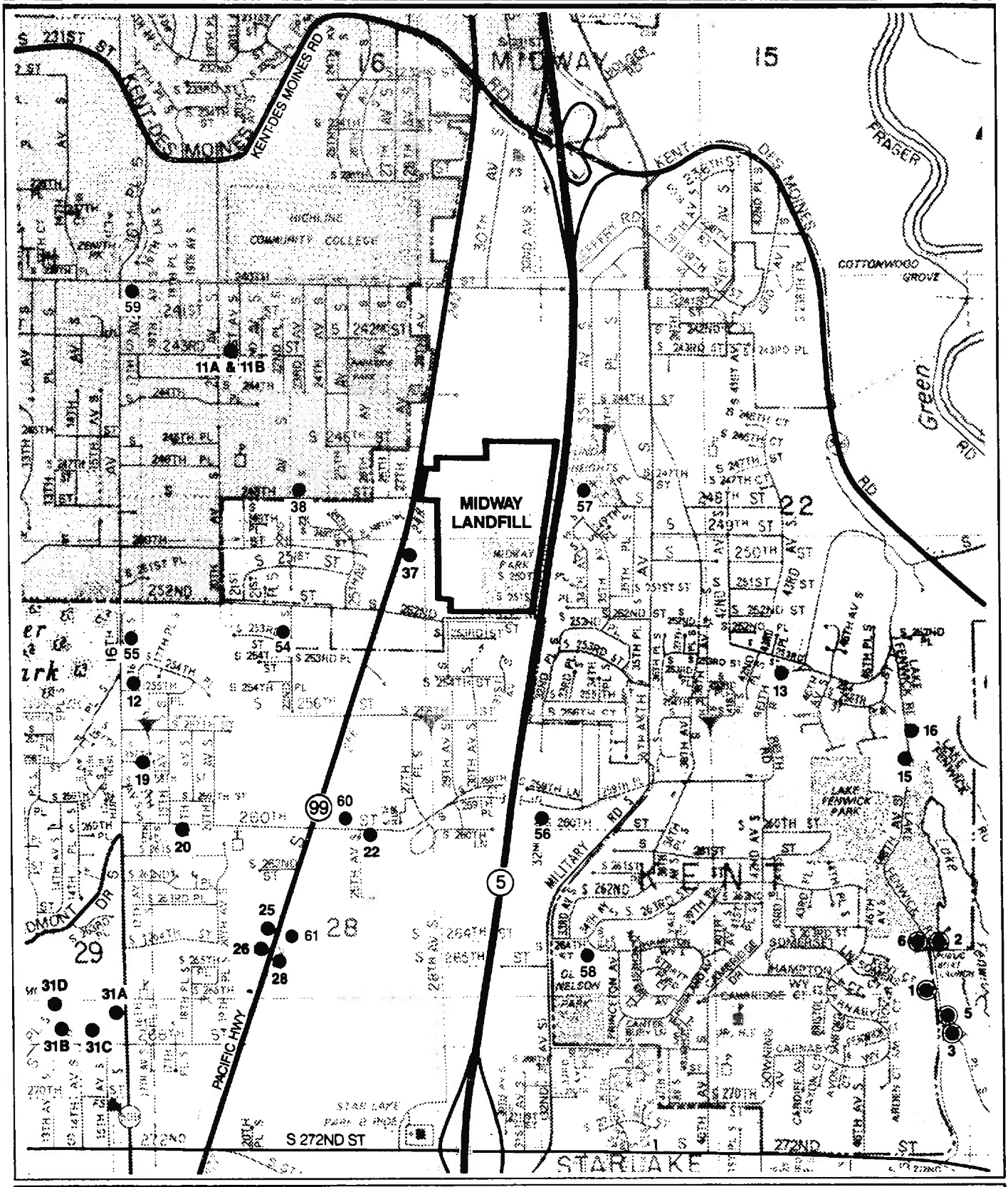
Table 4.1 (Continued. Page 3 of 4)

Well #	Owner/Property Address	Location	Well Depth (ft)	Depth to Water (ft)	Present Use	Condition
31B	Waldron 1300 S. 268th Kent, WA	T22N R4E Sec. 29 1/4NE 1/4SE			Unused	Operable
31C	R. Sadler 1404 S. 268th St. Kent, WA	T22N R4E Sec. 29 1/4NE 1/4SE			Unused	Operable
31D	R. Chester 1308 S. 268th St. Kent, WA	T22N R4E Sec. 29 1/4NE 1/4SE	42		To be used for irrigation not drinking water	Covered Operable
37	H. Grohs 24860 Pacific Hwy. S. Kent, WA	T22N R4E Sec. 21 1/4NW 1/4SE	200		Unused	Covered Operable
38	Marcus Whitman Church 2130 S. 248th Kent, WA	T22N R4E Sec. 21 1/4NE 1/4SW			Unused	Covered Operable
54	J. Strange 25235-1/2 22nd Ave. S. Kent, WA	T22N R4E Sec. 21 1/4SE 1/4SW			Irrigation, not used for drinking water	Operable operating
55	C. Smith 25276-16th Ave. S. Kent, WA	T22N R4E Sec. 21 1/4NW 1/4SW			Unused	Filled Closed
56	B. Guitar 3133 S. 260th Kent, WA	T22N R4E Sec. 21 1/4SE 1/4NW			Unused	Capped
57	City of Kent	T22N R4E Sec. 22 1/4 SW 1/4 NW	425	Dry	Unused	Capped

Table 4.1 (Continued. Page 4 of 4)

Well #	Owner/Property Address	Location	Well Depth (ft)	Depth to Water (ft)	Present Use	Condition
58	City of Kent City of Kent Water Tower S. of S. 264th St. & E. of Military Rd.	T22N R4E Sec. 27 1/4 SW 1/4 NW	557	302	Unused	Capped
59	Water District #75 Well #5 P.O. Box 68100 Seattle, WA	T22N R4E Sec. 16 1/4 SW 1/4 SW	146		Unused	Abandoned
60	Water District #75 Well #8 (Same address)	T22N R4E Sec. 28 1/4 SW 1/4 NE	242	61	Unused	Abandoned
61	Water District #75 Well #14 (Same address)	T22N R4E Sec. 28	165	15	Unused	Abandoned

Note: Well numbers were assigned for the inventory. Missing numbers in a sequence represent wells that are no longer in existence or operable, or wells that lie outside a one-mile radius of the landfill.



SCALE IN FEET

0 1,000 2,000

N

- Wells Presently Being Used for Human Drinking Supplies
- Wells Not Currently in Use for Human Drinking Supplies

Figure 4.1
Private and Public Wells Within One Mile of the Midway Landfill

VI. RECOMMENDATION OF PREFERRED ALTERNATIVE

Based on the comparison of alternatives presented in the previous section of this technical memorandum, it is recommended that the preferred Surface Water Management Plan Alternative for the closure of the Midway Landfill be as follows:

A. I-5/East Drainage System

The drainage facilities to intercept and re-route runoff from I-5 and the area east of I-5 should consist of the detention basin, pump station, force main and gravity sewers as described in the DEIS. During the design of these facilities, methods should be explored to intercept as much runoff as possible by gravity storm sewers so that the size of any required detention and pumping facilities can be minimized.

B. Detention Facilities

Detention facilities should be provided so that the peak discharge from the 25-year storm does not exceed the existing peak flow at the point of discharge. The detention facilities should be located on-site as described for the On-Site Detention Alternative in the DEIS, so that the City can retain maximum control of all surface waters leaving the Midway Landfill. The on-site detention basin should be located on property to be acquired by the City adjacent to the north side of the Midway Landfill site.

C. Highway 99/West Discharge Route

The pipeline for discharging storm water from the Midway Landfill should follow the route of the Wetland Discharge Alternative described in this technical memorandum. In addition to providing a discharge for surface water from the Midway Landfill, this route corrects existing drainage problems between Highway 99 and the wetland area, but causes very little change in the existing conditions in the wetland and North Fork of Smith Creek. This alternative causes disruption to the fewest number of adjacent properties, causes the least disruption to traffic and transportation systems, and has the least impact on public services such as school bus routes. It involves the

jurisdiction of only one municipality (City of Kent), is the shortest in length and, therefore, can be constructed in the shortest time. This alternative offers flexibility and is capable of being extended along any one of the other alternative discharge routes if future conditions should warrant. Because this alternative discharges into drainage courses that eventually lead to Parkside School and City of Des Moines storm drainage facilities that currently have inadequate capacity for the 25-year storm, the City of Seattle will pursue with the School District and City of Des Moines plans for improving these under-capacity facilities.

Appendix E

Drinking Water Well Information
(available upon request)