ENVIRONMENTAL PARTNERS INC

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Cleanup Action Plan

Brookdale Golf Course
1802 Brookdale Road East
Tacoma, Washington

Prepared For:

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March 18, 2019

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1146
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Betsy Wing
Project Geologist

EPI Project Number: 74001.0

QR TM TR TM

TABLE OF CONTENTS

FIGURES

ATTACHMENTS

ABBREVIATIONS AND ACRONYMS

Abbreviation/ Acronym	Definition
bgs	Below ground surface
CAP	Cleanup Action Plan
COC	Contaminant of concern
CSI	Continued Subsurface Investigation
CSM	Conceptual site model
CUL	Cleanup level
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
EPI	Environmental Partners, Inc.
FSI	Focused Subsurface Investigation
HASP	Health and Safety Plan
Ichijo	Ichijo USA Co. LTD.
MTCA	Model Toxics Control Act
NFA	No Further Action
OSHA	Occupational Safety and Health Administration
PPE	Personal protective equipment
RCW	Revised Code of Washington
RI/FFS	Remedial Investigation / Focused Feasibility Study
TPCHD	Tacoma-Pierce County Health Department
TEE	Terrestrial Ecological Evaluation
VCP	Voluntary Cleanup Program
WAC	Washington Administrative Code
WISHA	Washington Industrial Safety and Health Act

1.0 INTRODUCTION

Environmental Partners, Inc. (EPI) is pleased to submit this *Cleanup Action Plan* (CAP) presenting current site conditions, remedial objectives, and the proposed cleanup action to address impacts to soil at the Brookdale Golf Course (Brookdale) located at 1802 Brookdale Road East, Tacoma, Washington (subject property). The Brookdale Golf Course is currently owned by Ichijo USA Co. LTD. (Ichijo) and consists of four tax parcels (Pierce County tax parcels 0319158700, 0319158701, 0319225700, and 0319225701) totaling approximately 142.3 acres. The subject property is in the process of redevelopment as a residential subdivision with single-family detached homes. The location of the property is shown on Figure 1. The boundaries of the property shown relative to surrounding properties are depicted on Figure 2. The areas of impacted soil at the subject property, while located in separate and discrete areas, are all impacted by the same compounds and are therefore collectively referred to as a single "Site."

The current environmental conditions at the subject property and Site are documented in the *Remedial Investigation and Focused Feasibility Study Report*, dated March 12, 2019 (RI/FFS Report; EPI 2019), which will be submitted to the Washington State Department of Ecology (Ecology) under the Voluntary Cleanup Program (VCP) pending Client review. It is EPI's opinion that the data generated by the investigative tasks completed at the subject property and described in the RI/FFS Report were sufficient to select and implement a cleanup action.

This CAP presents a brief summary of the existing environmental conditions at the subject property and the remedial process that will be followed to comply with the requirements of the Model Toxics Control Act, Chapter 70.105D of the Revised Code of Washington (RCW) and its associated Cleanup Regulations, Chapter 173-340 of the Washington Administrative Code (WAC), referred to herein as "MTCA."

The sole affected environmental medium at the subject property is soil. Surface and shallow subsurface soils on portions of the subject property are impacted with the organochlorine pesticide dieldrin. The impacts to the subject property were the result of historical and routine golf course maintenance activities. The contaminant of concern was used in a lawful manner consistent with its intended purpose and use. As such, the impacts to the subject property are not considered a reportable release under WAC 173-340-300 and are specifically exempted by WAC 173-340-300 (3)(a). This CAP presents the means and methods for implementing a remedy consisting of excavation and off-site disposal of all impacted soils and the sampling and analysis necessary to demonstrate attainment of a CUL that is protective of all current and potential future exposure pathways.

This CAP has been prepared in general accordance with MTCA and Ecology policies. Redevelopment of the subject property and implementation of this CAP are tentatively scheduled to begin in May 2019. With the submittal of this CAP to Ecology, EPI and Ichijo are requesting an Advisory Opinion regarding the acceptability of the planned actions and the likelihood that successful completion of these actions will result in a No Further Action (NFA) Determination for the subject property.

1.1 Purpose

The CAP presented herein is a required component of the MTCA Site cleanup process. The purpose of the CAP is to identify the proposed cleanup action for the Site and to provide an explanatory document for the administrative record. More specifically, this plan:

- Describes the Site;
- Summarizes current Site conditions;
- Summarizes the cleanup action alternatives considered in the remedy selection process;
- Describes the selected the cleanup action for the Site and the rationale for selecting this alternative;
- Identifies Site-specific cleanup levels (CULs) and points of compliance for each hazardous substance and medium of concern for the proposed cleanup action;
- Identifies applicable state and federal laws for the proposed cleanup action;
- Discusses performance and compliance monitoring requirements; and
- Presents the schedule for implementing the CAP.

1.2 Previous Studies

Several environmental investigations relevant to the Site have been conducted since 2016. Details of the investigations are summarized in the RI/FFS Report. The environmental investigations conducted to date include the following:

1.2.1 2016 Initial Limited Site Investigation by Robinson Noble

The limited site investigation was initiated to evaluate selected areas for the presence or absence of organochlorine pesticides and herbicides resulting from routine golf course operations. The assessment included the analysis of three soil samples, two of which were collected from the maintenance area and one from the practice green located proximate to the south side of the golf course clubhouse. The results indicated the presence of organochlorine pesticides, specifically dieldrin, in concentrations exceeding applicable CULs. Organochlorine herbicides were not detected as a result of this investigation (Robin Noble 2016).

1.2.2 2017 Focused Subsurface Investigation by EPI

The Focused Subsurface Investigation (FSI) included the sampling and analysis of shallow surface soils from select tees, greens, and fairways of the golf course. A total of 50 percent of the golf course's tees (nine tees), greens (nine greens), and fairways (nine fairways) were sampled and analyzed for

organochlorine pesticides as a result of this investigation. One drinking water sample was collected from the clubhouse tap and an additional groundwater sample was collected from the irrigation pond to assess for impacts to local shallow groundwater and surface water. The golf course is served by an on-property drinking water well completed in the shallow aquifer (EPI 2019).

The results indicated that pesticide impacts were not present in shallow soils within the fairways, surface water, or groundwater at the subject property. The FSI did indicate that pesticides were present in soils within the tees and greens. Dieldrin and aldrin were detected at concentrations exceeding MTCA Method B soil CULs for residential use. In no instance was aldrin detected in concentration exceeding applicable CULs where dieldrin did not also exceed applicable CULs. Of the other pesticides detected, none were detected in a sample where dieldrin was not detected. None of the other pesticides detected were observed at concentrations exceeding a published MTCA Method B soil CUL. Based on these findings, dieldrin was considered an indicator hazardous substance (IHS) for the subject property.

1.2.3 2018 Continued Site Investigation by EPI

The Continued Site Investigation (CSI) assessed the remaining tees and greens not evaluated in the FSI to further characterize the lateral extent of dieldrin impacts to soil. The CSI also included the further assessment of lateral and vertical extent of impacts in locations identified in the FSI to have dieldrin in concentrations exceeding a CUL. A total of 693 soil samples were collected throughout the Site (EPI 2019).

The results of the CSI indicate tees and greens at the subject property are impacted with dieldrin at depths ranging 0.5 and 2.5 feet below adjacent grade. The lateral extent of impacts appears to be typically associated with the area of the greens and tees and the adjacent “fringe” grass.

The FSI and CSI data were compiled and presented in the RI/FFS Report presented under separate cover (EPI 2019). The reviewer is directed to the RI/FFS Report for a detailed description of the prior investigative actions and the findings and conclusions of those actions.

1.3 Regulatory Framework

This CAP has been prepared accordance with MTCA and its implementing regulations and with current Ecology policies and practices. The subject property is under the regulatory primacy of Ecology. The Tacoma-Pierce County Health Department (TPCHD) also asserts the prerogative to provide regulatory oversight of properties within Pierce County, although TPCHD does not provide NFA Determinations. Demonstrating compliance with MTCA to the satisfaction of Ecology is the typical Site closure mechanism for TPCHD.

2.0 SITE DESCRIPTION

2.1 Site History

The Brookdale Golf Course has been operating at the subject property since approximately 1931. Prior to development as a golf course the property was homesteaded as early as 1850 and was used as a hop

farm until redevelopment as a golf course in 1930. The subject property is primarily open space with landscaped grass and tree cover. Narrow asphalt and crushed gravel cart paths provide access throughout the subject property. Multiple structures are present on the subject property including a clubhouse, retail store, golf cart storage, and an open-sided building are located to the north, proximate to Brookdale Road East, which forms the northern subject property boundary. Outbuildings, including maintenance and utility sheds, are located proximate to the northwestern corner of the subject property; one shed is located on the southern portion of the subject property, just south of Clover Creek. The subject property is currently zoned as Residential Resource, intended for low-density single-family residential uses, which are compatible or integrated with areas of unique open space character and/or environmental sensitivity (Pierce County 2018).

2.2 Human Health and Environmental Concerns

Dieldrin is present in shallow surface and subsurface soils at variable depths from approximately 0.5 to 2.5 feet below ground surface (bgs). The distribution of dieldrin impacts across the Site is limited to the tees, greens, and adjacent fringe areas surrounding the greens of the Brookdale Golf Course. Dieldrin was detected at concentrations greater than the MTCA Method B Soil CUL that is protective of the future residential use of the Site as well as potential environmental receptors. The RI/FFS presents a detailed description of CUL development and evaluation for the Site.

Based on the results of the RI/FFS, the only contaminant of concern (COC) for the Site is dieldrin and the only affected environmental medium is soil. The potential current and future exposure pathway is:

- Ingestion and direct contact with impacted soil.

Potential human receptors associated with these exposure pathways include commercial workers during construction of the planned residential development. Terrestrial ecological receptors associated with these exposure pathways include wildlife, vascular plants, and soil biota receptors identified in the Terrestrial Ecological Evaluation (TEE; EPI 2019).

A diagram representing the conceptual site model (CSM) for the Site is presented in Attachment A.

2.3 Cleanup Levels

Cleanup levels for soil were evaluated in accordance with MTCA requirements and take into account exposure pathways and receptors based on current and future uses of the Site. Based on the CSM and TEE, exposure pathways for both human and ecological receptors were taken into consideration. The exposure pathways of concern at the Site are ingestion and direct contact with impacted soil. The CUL development for the Site is documented in the RI/FFS Report.

The MTCA Method B CULs for soil are considered fully protective of each of these potential exposure pathways, which allow for unrestricted land use. The selected MTCA Method B Soil CUL for the COC in Site soils is:

- Dieldrin – 0.0625 milligrams per kilogram (mg/kg).

The selected CUL is lower than the published TEE value of 0.07 mg/kg (EPI 2019).

3.0 DESCRIPTION OF SELECTED REMEDY

3.1 Site Description—Lateral and Vertical Extent of Impacts

In accordance with MTCA, the Site consists of all areas at the Brookdale Golf Course where contaminants at concentrations that exceed applicable CULs are located. Based on the results of the RI, dieldrin-impacted soils are located primarily in the tees and greens of the Brookdale Golf Course. The depth of impacts varies between approximately 0.5 and 2.5 feet below grade; the lateral extent appears to be generally associated with the area of greens and tees and the surrounding fringe grass. In some areas impacts extend to lower lying areas between tees or areas that may have received runoff adjacent to steeper slopes. Figures 3 through 17 illustrate the estimated extents of impacts based on observed conditions in Site soils. For the purposes of this CAP, the Site boundary is defined by the lateral and vertical extents of dieldrin exceeding the Site-specific CUL.

The CAP includes provisions for performance sampling and analysis at the vertical and lateral limits of remedial excavation in order to confirm attainment of the target CUL in all areas. The final limits of the Site will be established through that performance and confirmational sampling and analysis.

3.2 Remedial Alternatives Evaluation and Selection

A detailed discussion of the evaluation and selection of the remedial alternative is presented in the RI/FFS Report (EPI 2019). Remediation at the Site is focused on the excavation and off-Site disposal of dieldrin-impacted soil. Due to the shallow nature of the impacts present on-Site and the impending redevelopment of the subject property requiring substantial earthwork and regrading of the property, a full soil removal action is the most viable cleanup action for the Site. As noted, the selected remedial approach for the Site consists of direct excavation and off-Site disposal of soils from all impacted areas of the subject property. The selection of this remedial strategy is based on the following rationale:

- The depth and lateral extent of impacted soils is limited and well delineated;
- The impacted soils are shallow and accessible to direct excavation using standard excavation equipment; and
- Excavation is practicable, highly effective, permanent, and its effectiveness is quantifiable through performance and confirmation sampling.

3.3 Description of the Cleanup Action

As indicated above, direct excavation and off-Site disposal of dieldrin-impacted soils is selected as the preferred cleanup action for the Site. The cleanup action will consist of the systematic removal of impacted soil as illustrated in Figures 3 through 17. EPI will implement performance and confirmation soil sampling in the excavation sidewalls or edges, and bottoms to evaluate and demonstrate compliance with CULs throughout the remedial excavations. Following attainment of CULs, the completed

excavations will be backfilled and/or regraded as necessary for the future residential development of the Site.

4.0 TECHNICAL APPROACH

The following sections provide descriptions of remedial activities that will be performed to complete the planned remediation strategy at the subject property. Implementation of this remedial strategy will include the activities described below for the Site.

4.1 Permitting

Permitting for the excavation portion of the remedial actions will be addressed through the permitting process for the pending redevelopment. The permits include the necessary grade and fill permitting and the stormwater general permit. The contractor for site development will responsible for all permitting and with the necessary compliance testing and documentation associated with those permits.

Impacted soil excavated from the subject property will be transported to Hidden Hills Landfill located in Puyallup, Washington. The soil to be excavated was pre-profiled with the landfill and confirmed as acceptable and within the operating permits for the facility. No other permits or approvals are required for implementation of the CAP.

4.2 Health and Safety Plan

A Health and Safety Plan (HASP) for use by EPI personnel will be prepared prior to initiating the cleanup action. The HASP will establish the general health and safety practices for EPI personnel performing the cleanup action. EPI will not be responsible for the health and safety of other personnel. EPI will not be the general contractor for this project and will not control the job site. However, EPI will be available to advise other workers on the health and safety measures that EPI personnel will be using, and EPI will share all monitoring data and will advise other workers when EPI personnel are upgrading or modifying their level of personal protective equipment (PPE). A copy of the HASP will be kept at the subject property and will be made available to authorized visitors to the subject property for general information. The HASP will pertain only to those activities relating to handling and management of impacted soil and related hazards, and will have no relation to any other phases of the project.

The HASP will include the following provisions to protect human health during implementation of the cleanup action:

- Access to the subject property will be limited to authorized personnel.
- Work will be conducted in accordance with applicable Occupational Safety and Health Administration (OSHA) and Washington Industrial Safety and Health Act (WISHA) regulations. Contractors will be required to develop and implement their own health and safety procedures in accordance with applicable laws and regulations.

- EPI personnel involved in the remedial excavations will be required to wear PPE and monitor atmospheric conditions of volatile compounds.

4.3 Site Preparation

All remedial areas identified during the RI are readily accessible to excavation equipment and additional preparation will not be required prior to commencement of remedial activities. The proposed remedial excavation areas will be clearly marked with stakes, flags, or paint, as appropriate and the public one-call underground locating service will be notified prior to excavation.

Site preparation activities will comply with the requirements of the applicable permits and are subject to inspection by regulatory personnel. The general contractor for site development will be responsible for permit compliance.

4.4 Soil Disposal

Dieldrin-impacted soil removed from the subject property will be transported to Hidden Hills Landfill in Puyallup, Washington, for disposal. Temporary erosion and sediment control measures, in accordance with applicable permits, will be implemented and maintained during loading, hauling, and transport in accordance with applicable laws, permits, and other best management practices (BMPs). Sediment control measures will be implemented as needed to ensure that sediment is not tracked off the subject property during soil loading and hauling. Impacted soil will be hauled by truck to the selected disposal facility in accordance with applicable regulations, codes, and permit conditions, including those imposed by the Washington State Department of Transportation, TPCHD, Pierce County, Ecology, or other agencies with regulatory authority.

4.5 Soil Excavation

Organochlorine pesticides-impacted soil with a concentration of dieldrin greater than 0.0625 mg/kg will be physically removed using appropriately-sized excavation equipment. Removal of impacted soils will be conducted as directed by EPI field personnel. The initial lateral and vertical extents of each excavation area will be guided by the RI results; the final lateral and vertical extents will be guided by the results of performance sampling as described in Section 4.6.2.

Figures 3 through 17 present each remedial excavation area and the estimated extent of impacts within each excavation area.

Within each remedial excavation area, the initial excavation will begin near the center of the estimated area of impact and extend outwards towards the estimated edge of impacts. The proposed initial depth of excavation is based on the maximum depth of observed impacts for each Area of Interest.

For remedial excavation areas with variable depths of impacts, environmental field personnel will use survey equipment to guide excavation depths. The vertical and lateral extent of each excavation area will ultimately be determined based on performance sampling results.

4.5.1 Excavation, Handling, and Disposal of Dieldrin-Impacted Soil

Excavation, handling, and disposal of dieldrin-impacted soil will be conducted in accordance with Washington State Solid Waste Management Laws and Regulations (Chapter 70.95 RCW, Chapter 173-351 WAC, and chapter 173-304 WAC), Dangerous Waste Regulations (Chapter 173-303 WAC), and Ecology guidance. The excavation of impacted soil will be conducted in each of the areas identified above and on Figures 3 through 17. The final lateral and vertical extents of excavation in each area will be guided by the results of performance and confirmation samples. Performance and compliance samples will be collected and analyzed as described in Section 4.6.2.

Under the direct supervision of EPI personnel, the excavation contractor will segregate all impacted soil to keep it separate from clean soil to the extent practicable. Impacted soils will typically be direct-loaded into trucks or containers (e.g., roll-off bins) and will be separately stockpiled.

If, for logistical reasons, stockpiling becomes necessary, any soil stockpiled overnight or temporarily stored on the property for more than 24 hours will be placed on plastic sheeting and covered with plastic sheeting to minimize the potential for runoff during precipitation events. Plastic sheeting covering the stockpiled soil will be sufficiently weighted down using sandbags or other heavy materials to keep the covering in place and prevent exposure.

4.5.2 Excavation Dewatering

It is not currently anticipated that dewatering will be necessary. According to an *Infiltration Feasibility Report* prepared for Azure Green Consultants (and cited in the *Remediation Drainage Report*), 10 test pits were excavated on the subject property. The shallowest groundwater seepage observed in the test pits occurred in 1 test pit at an approximate depth of 3.5 feet bgs, and at 9 to 10 feet bgs in the remaining test pits. A copy of the *Remediation Drainage Report* is included in Attachment B.

Based on the data generated during RI, the maximum anticipated depth of remedial excavation is 3 feet bgs. As such, EPI does not anticipate encountering groundwater during the remedial excavation.

4.5.3 Stormwater Management

No stormwater runoff is anticipated from the remedial excavations. According to the *Remediation Drainage Report* prepared by the site development consultant, any runoff generated during the remedial excavation will be retained within the individual depressions created as a result of the excavation (Attachment B).

4.6 Compliance Monitoring

Compliance monitoring includes protection monitoring, performance monitoring, and confirmational monitoring. Compliance monitoring is intended to fulfill the requirements of Sections 410, 740, 810, and 820 of MTCA. The following sections present the activities that will be performed for compliance monitoring during implementation of the cleanup action.

4.6.1 Protection Monitoring

Protection monitoring is intended to confirm that human health and the environment are protected during implementation of the remedial action (WAC 173-340-410(a)). Protection monitoring will be performed during all remedial activities that have a potential for generating chemical exposures. Protection of human health will be performed through the implementation of a Site-specific HASP prepared in accordance with the requirements of the OSHA and the WISHA standards for hazardous waste site operations (29 Code of Federal Regulations [CFR] 1910.120 and WAC 296-843). The HASP will pertain to only those activities related to the remedial action and will establish general and Site-specific health and safety practices and air monitoring for personnel performing the work.

4.6.2 Performance Monitoring

Performance monitoring is used to determine whether and where the cleanup action has attained the selected cleanup standards (WAC 173-340-410(b)). Performance monitoring for the cleanup action will consist of collecting and analyzing soil samples from the sidewalls and bottoms of the remedial excavations to evaluate whether the concentration of dieldrin is less than the applicable CUL.

MTCA allows the use of statistical methods to demonstrate compliance with CULs, provided the following requirements of WAC 173-340(7)(e) are met:

i. No single sample concentration is greater than two times the soil CUL;

ii. Less than 10 percent of the sample concentrations exceed the soil CUL; and

iii. The true proportion of samples that do not exceed the soil CUL shall not be less than 95 percent using a Type I error level of 0.05.

Once the initial limits of each remedial excavation are achieved, performance soil samples will be collected from the sidewalls or edges, and base of each remedial excavation area. One performance soil sample will be collected for every 600 square feet of remedial excavation base. Sidewall or edge samples will be collected at minimum from each cardinal direction (north, east, south, and west). For larger excavations, one sample will be collected from each 50 linear feet of sidewall or edge. These samples will be used to characterize the vertical distribution of dieldrin-impacted soil. Figure 18 illustrates a typical cross-section of a remedial excavation area.

Two performance samples will be collected at every performance sample location from the remedial excavation bottom: one sample from the newly exposed grade and an additional sample from 1 foot below the exposed grade. The deeper sample will be archived and analyzed if the shallower sample indicates impacts remain.

Performance samples will be analyzed for dieldrin using U.S. Environmental Protection Agency (EPA) Method 8081. If a performance sample concentration from the remedial excavation base exceeds the MTCA Method B CUL, the deeper sample will be analyzed. Samples that indicate concentrations of dieldrin greater than 0.0625 mg/kg will be over-excavated and performance samples will be collected

from the newly exposed excavation sidewalls or edges, and bottoms. This will continue until sidewall or edge, and bottom performance samples attain MTCA Method B CULs.

Up to 10 percent of the soil samples will be submitted for analysis of the full list of organochlorine pesticides using EPA Method 8081. This will provide independent and quantitative confirmation that remedial excavation of dieldrin has also resulted in remediation of all other organochlorine pesticides.

Additionally, 10 percent of samples will be submitted as blind field duplicates for analysis of either dieldrin or the full organochlorine pesticide list. This will provide an additional measure of quality assurance and quality control (QA/QC). This field QA/QC is in addition to the standard laboratory QA/QC consisting of matrix duplicate, matrix spikes, and matrix spike duplicates. Final laboratory analytical reports with all QA/QC data will be provided with the final *Cleanup Action Report* documenting the successful implementation of the CAP.

All soil samples will be collected into laboratory-supplied 4-ounce glass jars. Where possible, soil samples will be collected from the excavation sidewalls using stainless-steel sampling spoons and placed directly into the glass jar. If access to excavation sidewalls is not possible, an excavator will be used to remove soil from a particular area and the soil sample will then be collected from the excavator bucket. For those samples collected from the excavator bucket, a decontaminated stainless-steel spoon will be used to remove the top 6 inches of slough and a soil sample will be collected from the soil beneath. No composite samples will be collected for performance monitoring purposes. All sampling equipment will be single-use disposable sampling equipment that is decontaminated prior to use and disposed following sample collection.

Each sample container will have a sample label permanently affixed to the surface of the container. Information to be supplied on the sample label includes the project number, sample identification, initials of sampling personnel, date and time of sample collection, and analysis requested. Each sample will be identified according to the tee or green location, direction and sample type, and depth.

Sample identifiers will be assigned using the following scheme:

Area – Remedial Excavation Area Number – Direction/Sample Type – Sequential Identifier: Sample Depth

Where:

Area (1-15) = A1 for Area 1, A2 for Area 2, A3, for Area 3, etc.
Excavation Area/ Area of Impact Number = AOI-1, AOI-2, AOI-3, etc.
Direction/Sample Type = NSW for north sidewall, SSW for south sidewall, B for bottom, etc.
Sequential Identifier = 1, 2, 3, etc.
Sample Depth (in feet bgs) = 1.0, 1.5, 3.0, etc.

For example, sample A1-AOI-1-ESW-1:2.5 would be the first sample collected from the east sidewall (ESW) of the first remedial excavation area located Tee 1 at a depth of 2.5 feet bgs. Similarly, sample A13-G14-2-SSW-2:3.0 would be the second sample collected from the south sidewall of the second remedial excavation area located at Green14 at a depth of 3.0 feet bgs.

4.6.3 Confirmational Monitoring

Confirmational monitoring is intended to confirm the long-term effectiveness of the remedial action as presented in WAC 173-340-410(c). The remedial activities presented in this CAP are designed to remove impacted soils from the former Brookdale Golf Course Site and, as a result, attain compliance with CULs for soil on the subject property. Confirmational monitoring will be conducted for soil and will be based on the data for performance samples collected from the excavation limits. The final performance samples will be considered confirmation samples to document compliance with soil CULs at the terminal limits of the excavation.

4.6.4 Quality Assurance/Quality Control

After sample collection, all soil samples will be placed in coolers with sufficient ice to maintain an internal temperature of 4°C for the duration of the sample and transportation period. Performance soil samples will be analyzed by a fixed-base laboratory accredited by the State of Washington to perform such analyses. Depending on the project schedule needs, some samples may be analyzed on an expedited turnaround time.

Section 4.6.2, above, discusses field duplicate sample collection and analysis as wells as analytical QA/QC procedures. Sample results that are within a sample delivery group that do not have a surrogate recovery value within the allowable ranges may be rejected or re-analyzed by the laboratory. All results that are outside of analytical control limits will be flagged with the appropriate data qualifier. All laboratory analytical results, including internal laboratory QA/QC samples, will be included in the analytical data package and will be included with the CAR.

4.7 Site Restoration

After the excavation activities have been completed, the remedial excavation areas will be regraded as part of the full redevelopment of the subject property in conformance with the applicable permits obtained for the Project and BMPs.

5.0 SCHEDULE FOR IMPLEMENTATION

EPI understands that permitting associated with the planned construction activities for redevelopment of the subject property has been initiated and that necessary permits are pending and will be available in about the second quarter of 2019.

It is currently anticipated that this CAP will be implemented during the late spring and summer of 2019. Field work for completion of the CAP is likely to require up to 90 days to complete. An additional 90 days will be required for preparation of a CAR and submittal of that report to Ecology. It is currently anticipated that the CAR may be submitted to the VCP during the fourth quarter of 2019.

6.0 CLEANUP ACTION REPORT

Upon completion of the cleanup action, a CAR will be prepared. The CAR will document the completed remedial activities, the results of the activities, and the conclusions supported by those results. The CAR will be submitted to Ecology through the VCP along with a formal request for an NFA determination for the Site.

7.0 LIMITATIONS

To the extent that preparation of this CAP has required the application of best professional judgment and the employment of scientific principles, certain results of this work have been based on subjective interpretation. EPI makes no warranties, express or implied including and without limitation warranties as to merchantability or fitness for a particular purpose. The information provided in this CAP is not to be construed as legal advice.

This CAP was prepared solely for Ichijo and its affiliates, partners, and advisors, and the contents of this CAP may not be used or relied upon by any other person without the express written consent and authorization of EPI.

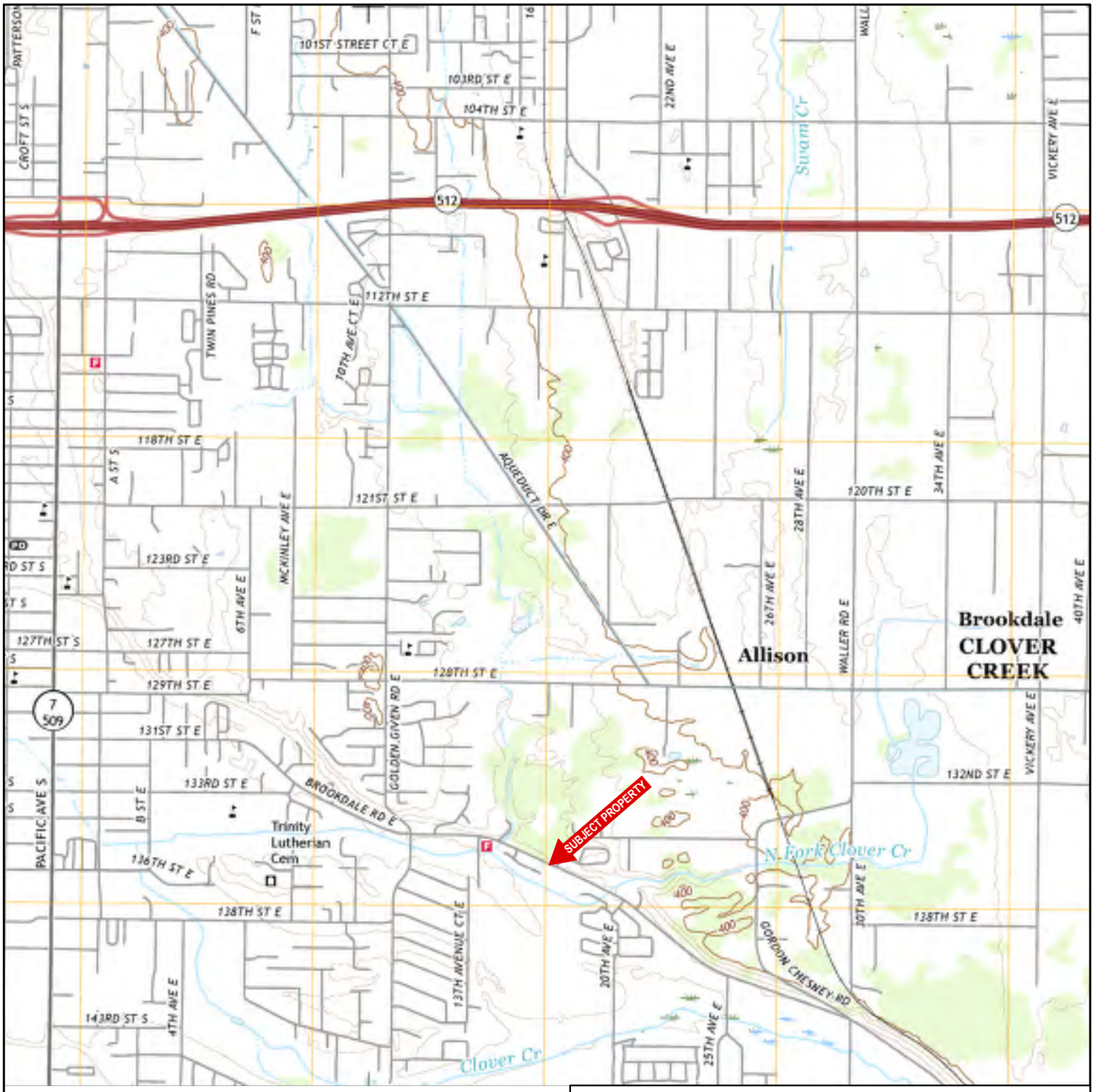
8.0 REFERENCES

Robinson Noble. 2016. *Limited Pesticide Investigation – Brookdale Golf Course, 1802 Brookdale Road East, Tacoma, Washington*. 14 December.

Environmental Partners, Inc. (EPI). 2019. *Remedial Investigation and Focused Feasibility Study, Brookdale Golf Course, 1802 Brookdale Road East, Tacoma, Washington*. 12 March.

Pierce County. 2018. Chapter 18A.10.080, Zone Classifications, Pierce County. Accessed: November 5, 2018. Retrieved from: https://www.codepublishing.com/WA/PierceCounty/html/PierceCounty18A/PierceCounty18A10.html

Figures



NOTES:

SOURCE: USGS 7.5 MINUTE QUADRANGLE (TOPOGRAPHIC)

TACOMA SOUTH, WA
2017

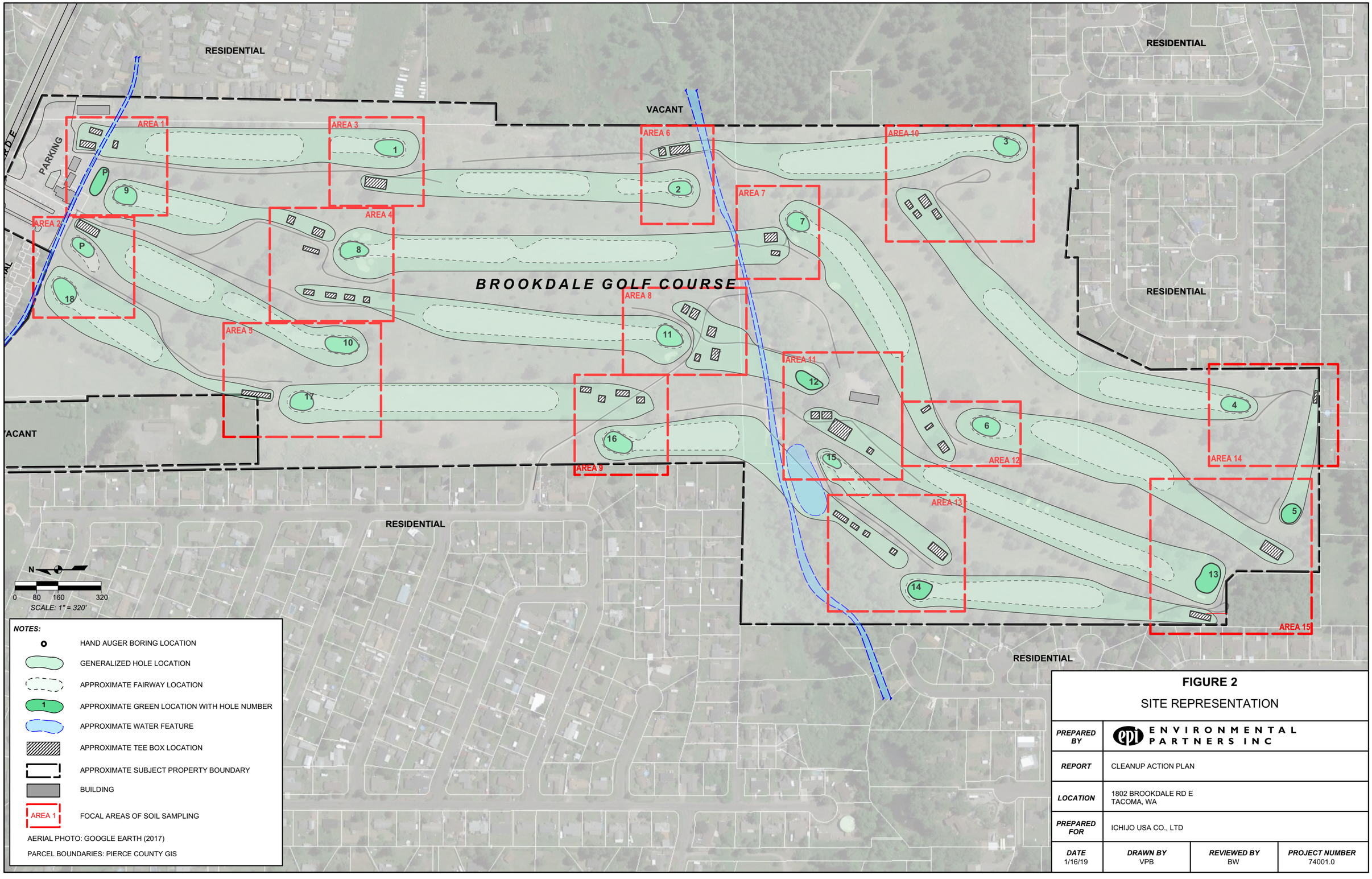
N

SCALE = 1:24,000

FIGURE 1

GENERAL VICINITY MAP

PREPARED BY	EPI ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0



NOTES:

- HAND AUGER BORING LOCATION
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 1 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- BUILDING
- AREA 1 — FOCAL AREAS OF SOIL SAMPLING

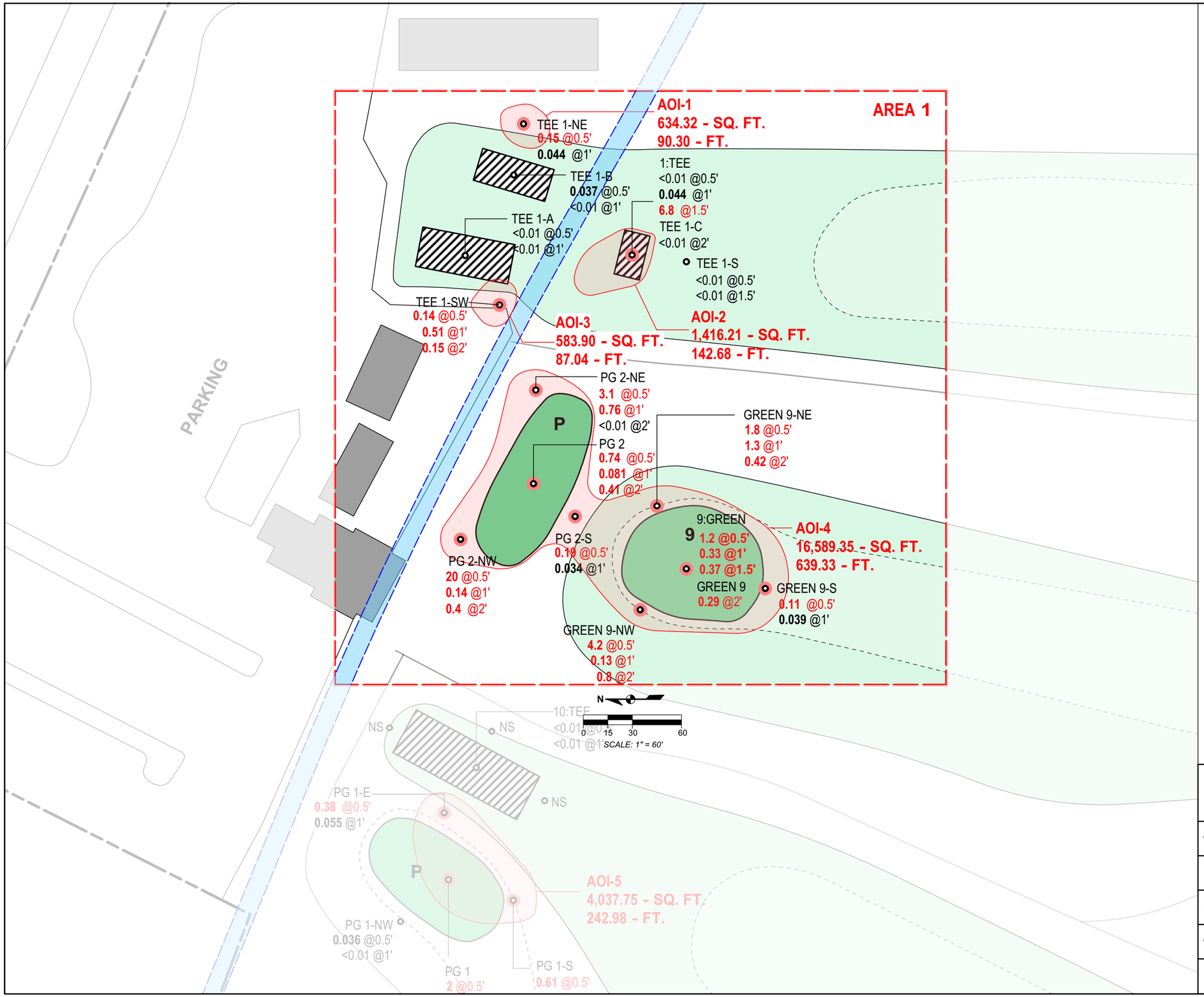
AERIAL PHOTO: GOOGLE EARTH (2017)

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 2

SITE REPRESENTATION

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0



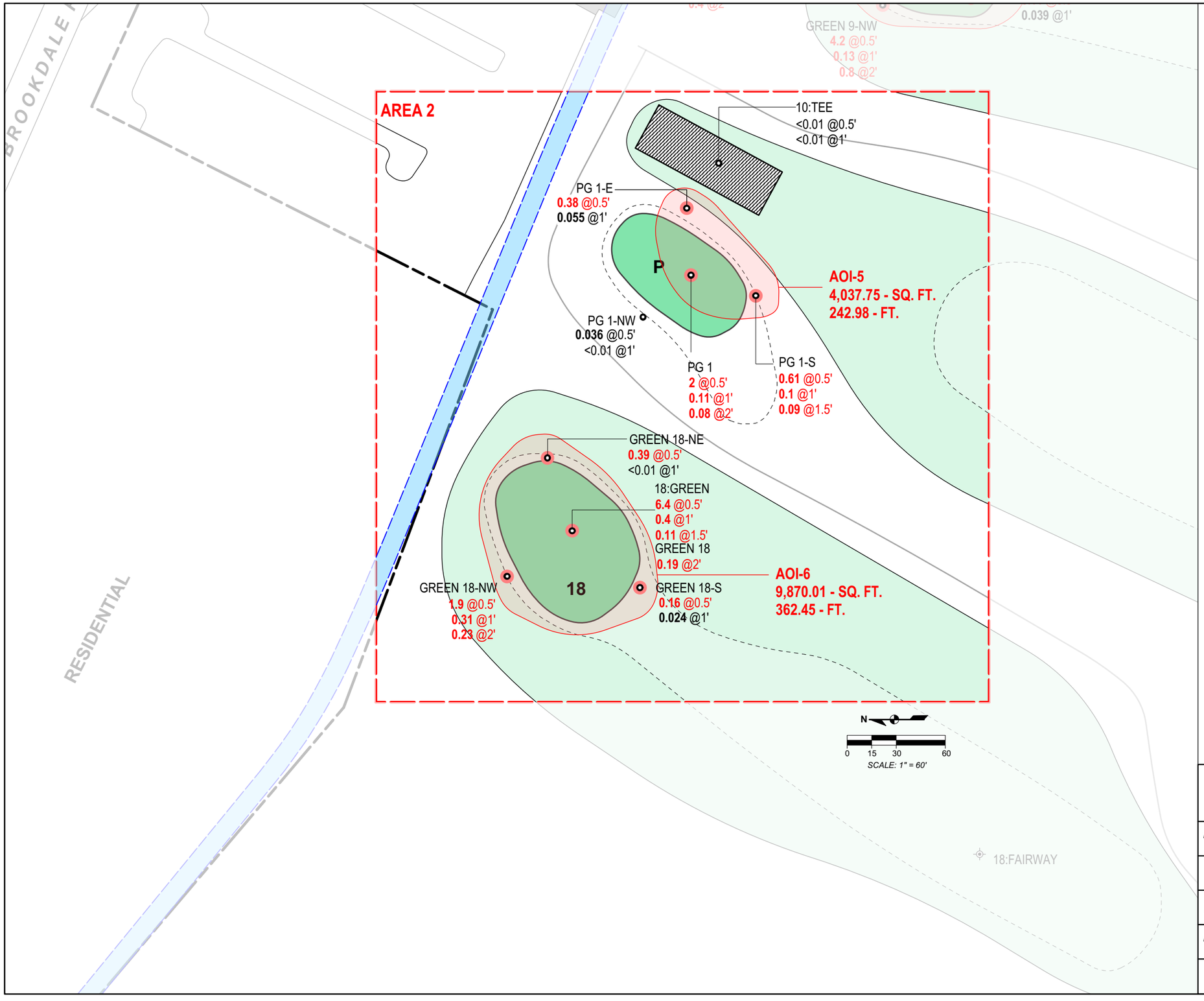
NOTES:

- HAND AUGER BORING LOCATION
- PG 2-S — SAMPLE LOCATION NAME
- 0.19 @0.5' / 0.034 @1' — SAMPLE DEPTH IN FEET IN FEET; SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg) **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg; PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-1 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 4,037.75 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 242.98 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 18 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER (P = PUTTING GREEN)
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 1 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 3
REMEDIAL EXCAVATION AREA 1
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	epi ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0



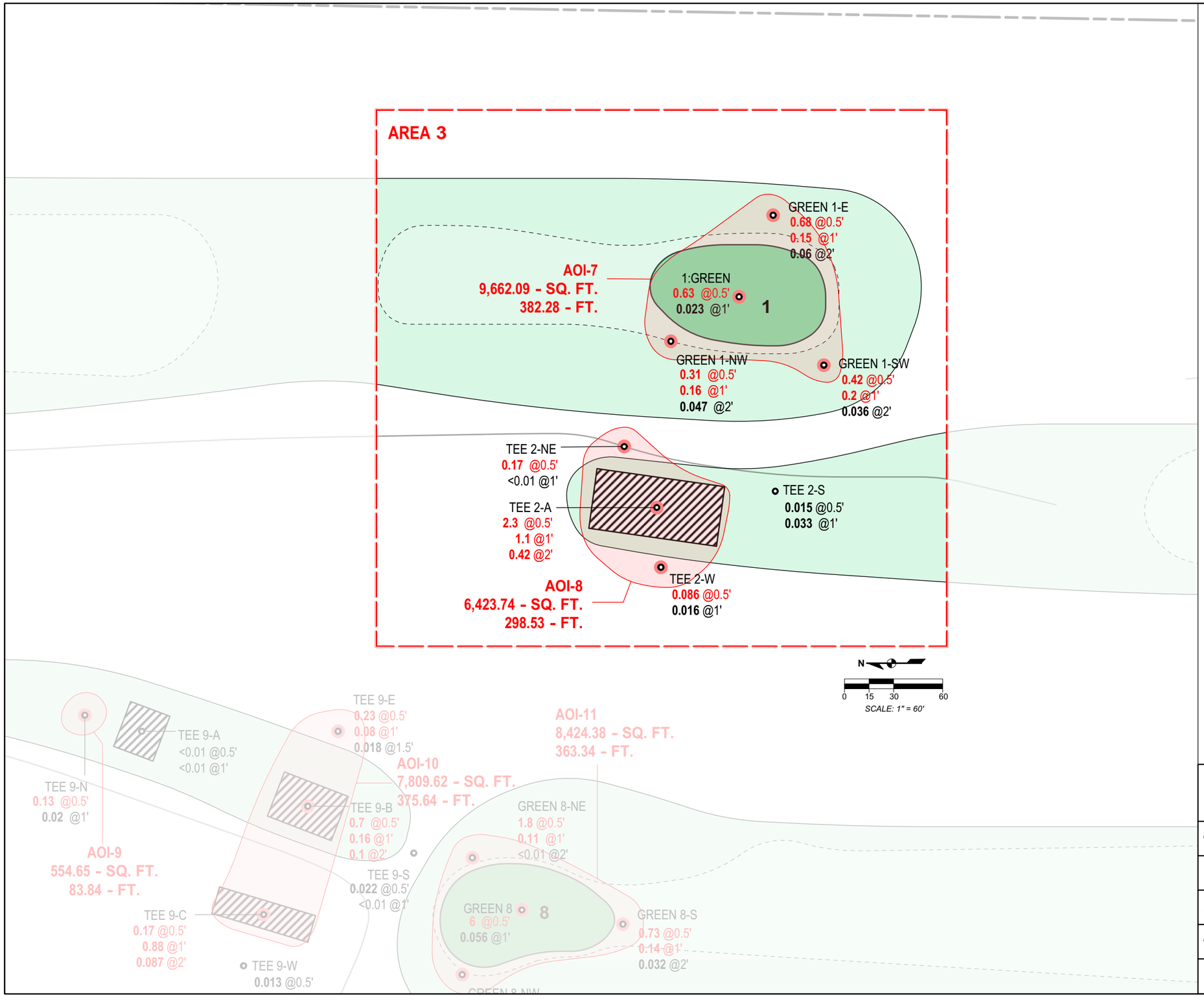
NOTES:

- HAND AUGER BORING LOCATION
- PG 2-S — SAMPLE LOCATION NAME
- 0.19 @0.5' / 0.034 @1' — SAMPLE DEPTH IN FEET IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg) **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-5 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 4,037.75 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 242.98 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 18 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER (P = PUTTING GREEN)
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 2 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 4
REMEDIAL EXCAVATION AREA 2
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0



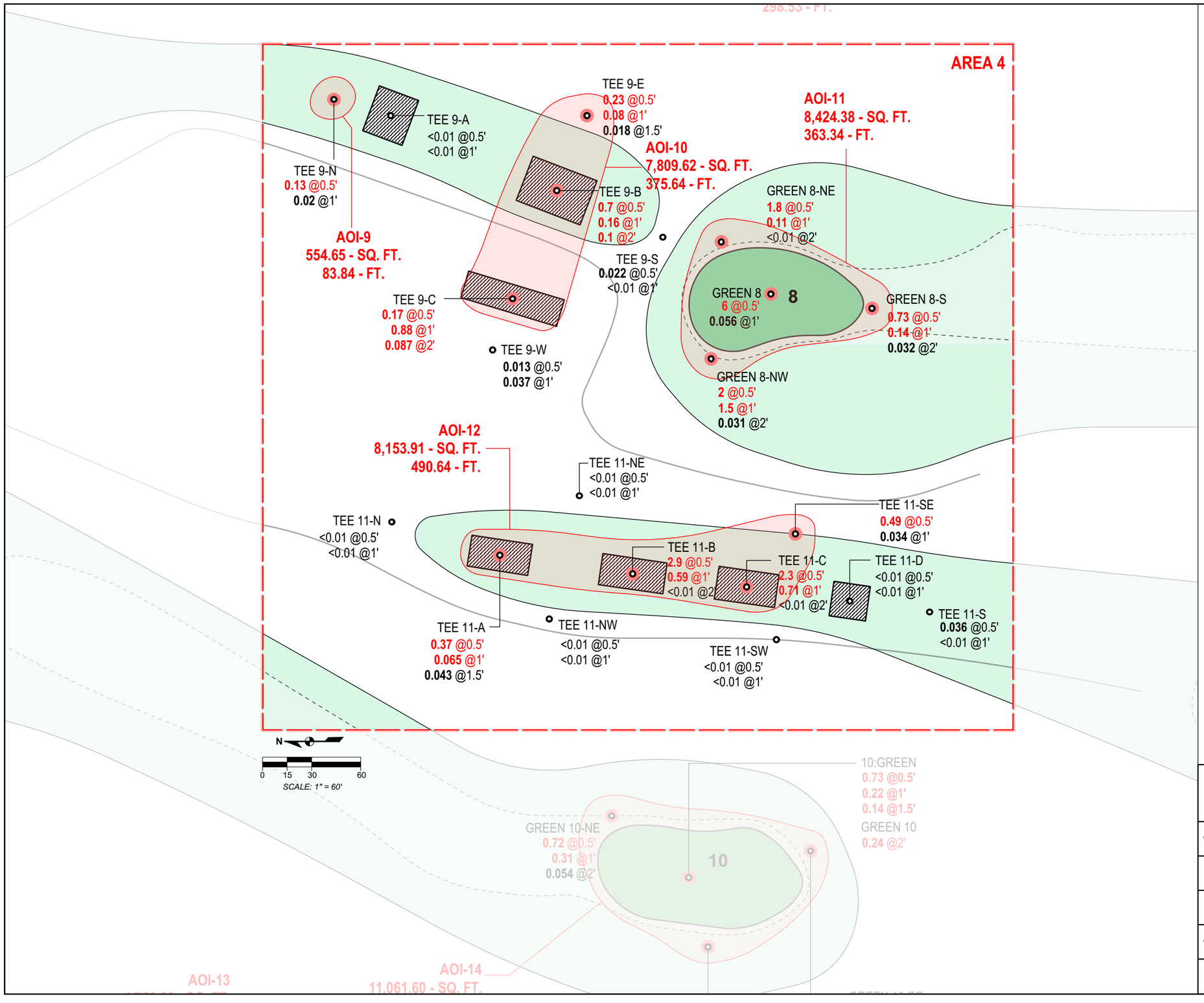
NOTES:

- HAND AUGER BORING LOCATION
- GREEN 10-SE – SAMPLE LOCATION NAME
- 0.36 @0.5' / 0.093 @1' / 0.016 @1.5' – SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-7 – AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 9,662.09 – SQ. FT. / 382.28 – FT. – APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.) / APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 1 – APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 3 – FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 5
REMEDIAL EXCAVATION AREA 3
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0



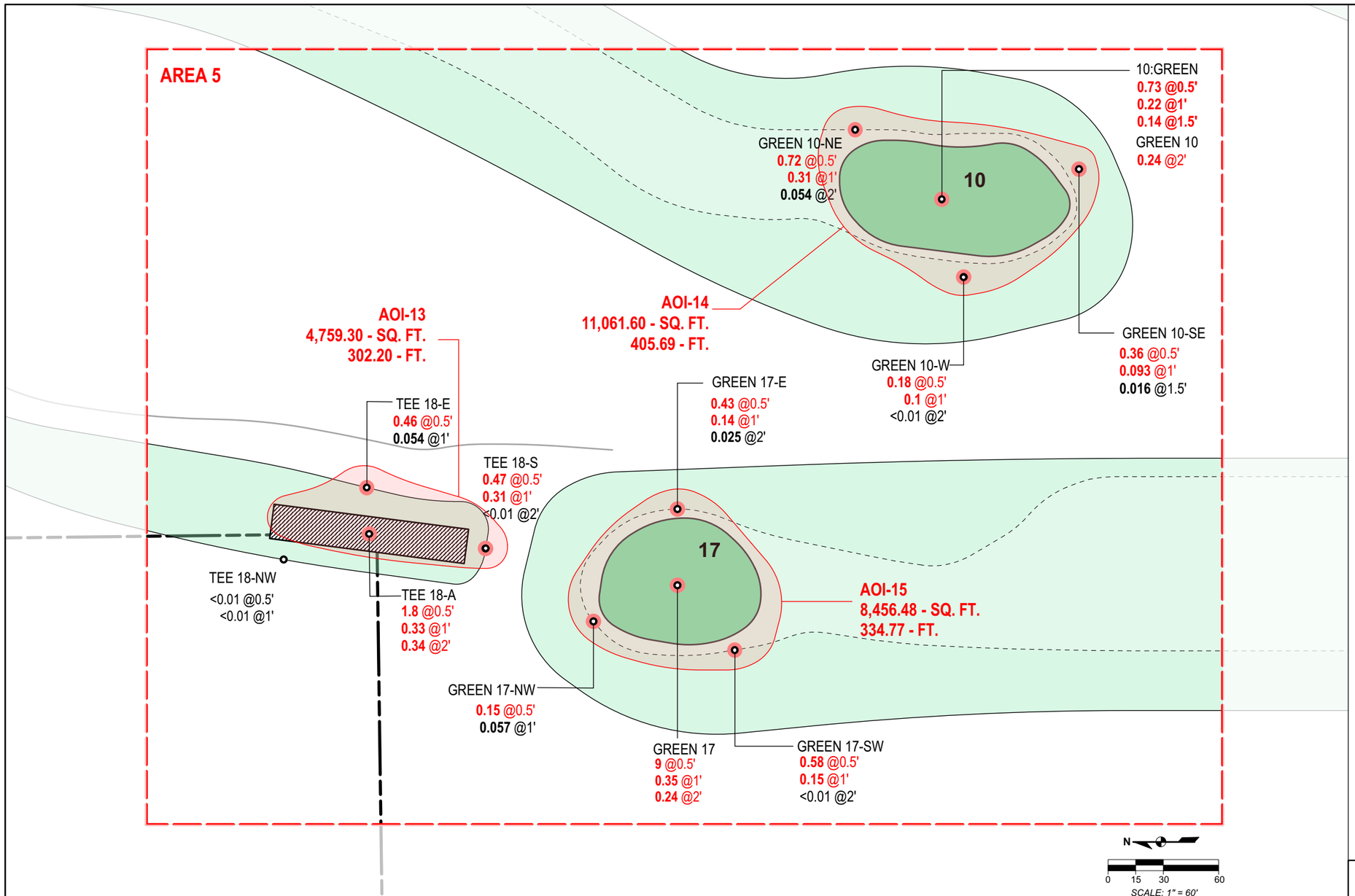
NOTES:

- HAND AUGER BORING LOCATION
- GREEN 10-SE — SAMPLE LOCATION NAME
- 0.36 @0.5' / 0.093 @1' / 0.016 @1.5' — SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-9 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 554.65 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 83.84 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 8 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 4 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 6
REMEDIAL EXCAVATION AREA 4
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0



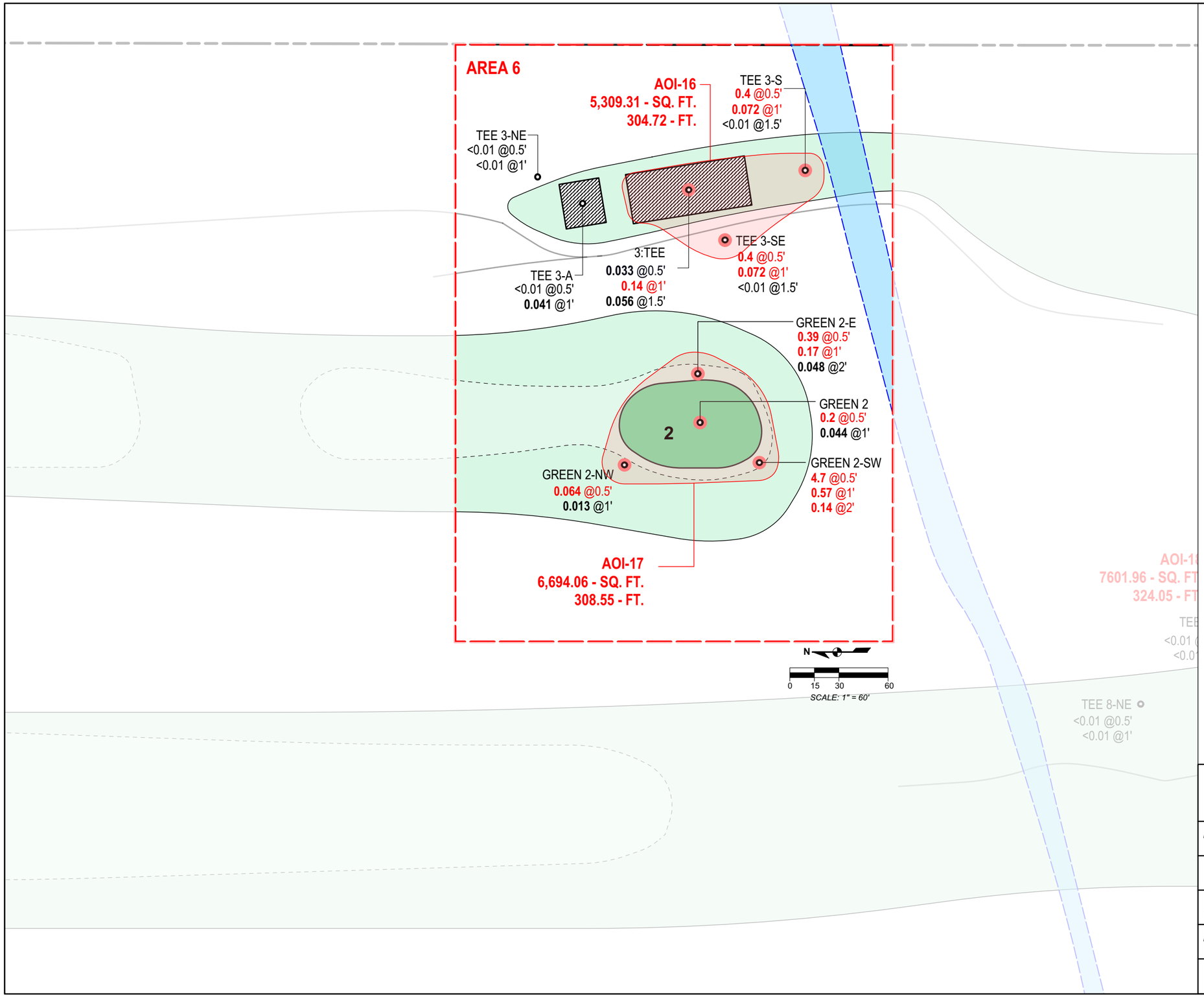
NOTES:

- HAND AUGER BORING LOCATION
- GREEN 10-SE – SAMPLE LOCATION NAME
- 0.36 @0.5' / 0.093 @1' / 0.016 @1.5' – SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-13 – AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 4,759.30 - SQ. FT. – APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 302.20 - FT. – APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 10 – APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 5 – FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 7
REMEDIAL EXCAVATION AREA 5
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0



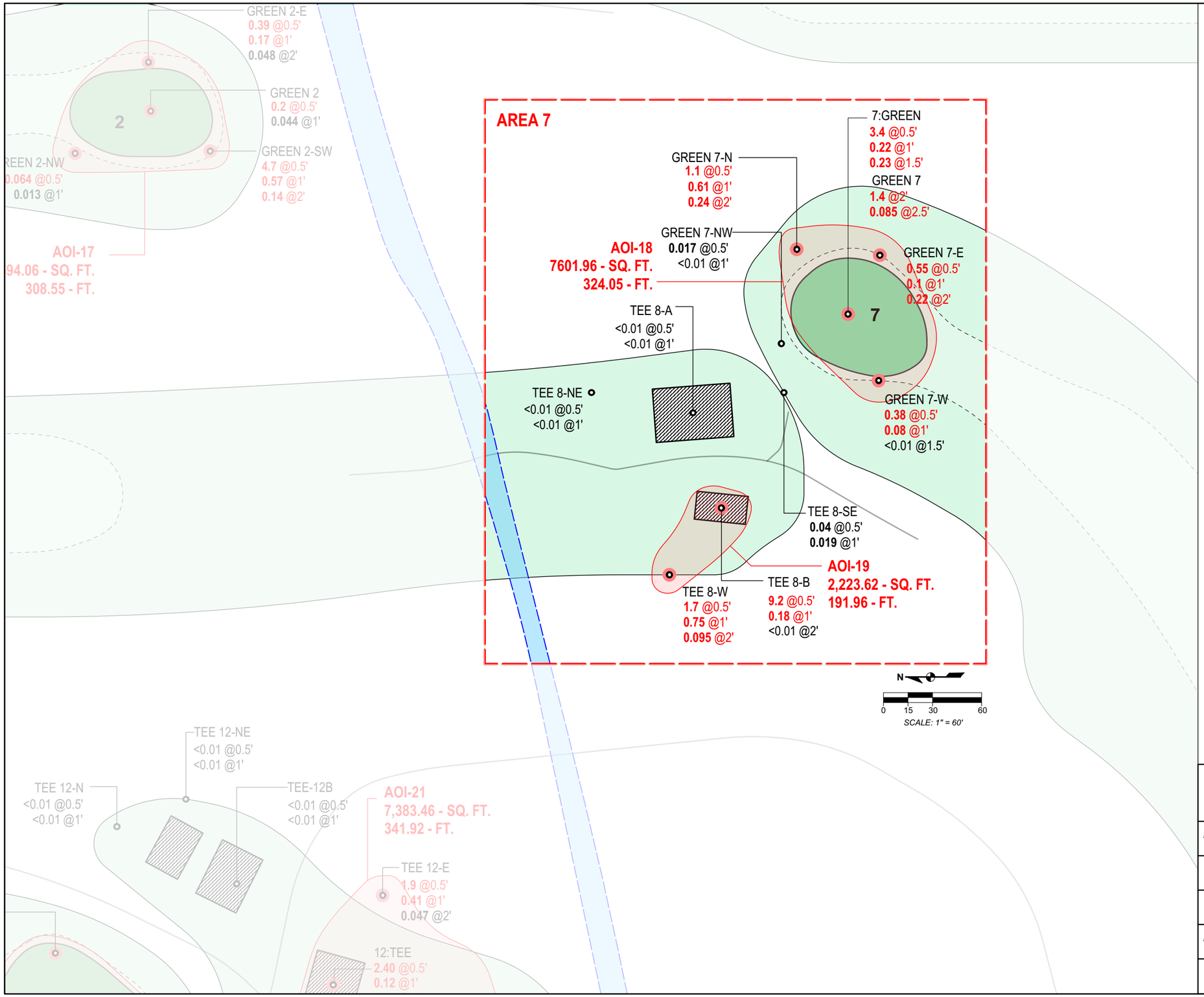
NOTES:

- HAND AUGER BORING LOCATION
- GREEN 2-E — SAMPLE LOCATION NAME
- 0.39 @0.5' / 0.17 @1' / 0.048 @2' — SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-16 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 5,309.31 - SQ. FT. / 304.72 - FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.) / APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 2 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 6 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 8
REMEDIAL EXCAVATION AREA 6
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0



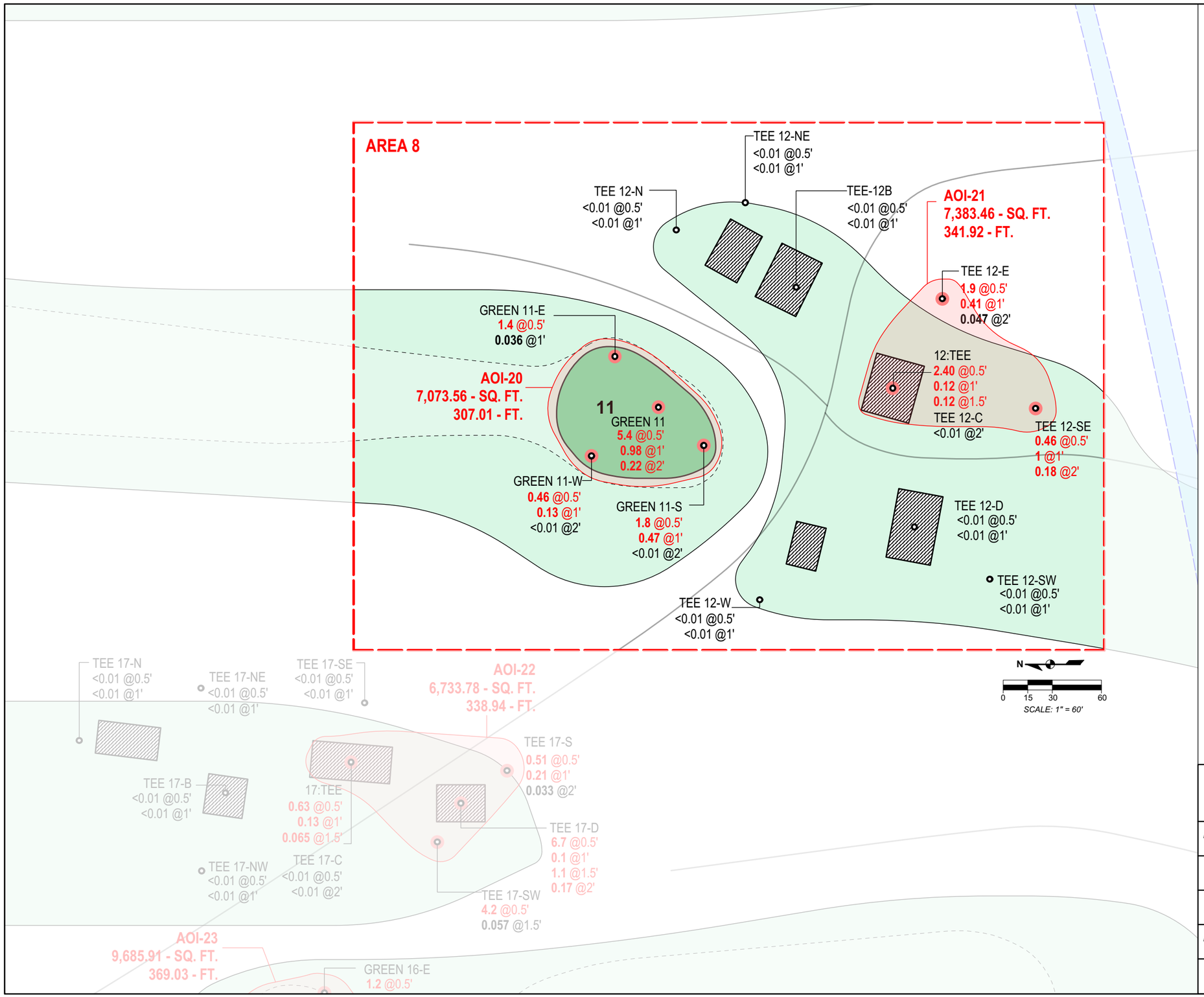
NOTES:

- HAND AUGER BORING LOCATION
- TEE 8-B — SAMPLE LOCATION NAME
- 9.2 @0.5' / 0.18 @1' / <0.01 @2' — SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-19 / 2,223.62 - SQ. FT. / 191.96 - FT. — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER; APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.); APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 7 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 7 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 9
REMEDIAL EXCAVATION AREA 7
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	**DRAWN BY** VPB	**REVIEWED BY** BW	**PROJECT NUMBER** 74001.0



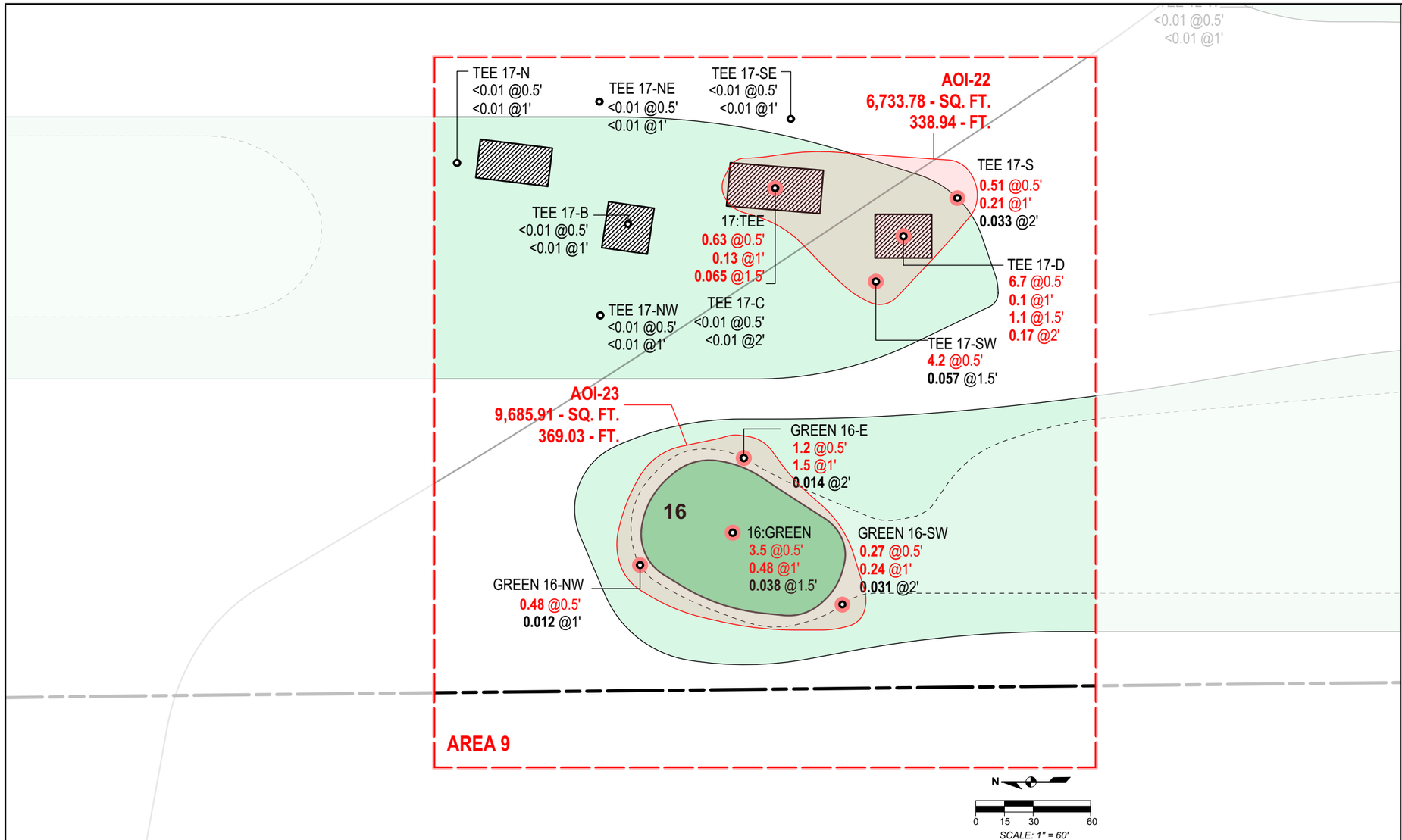
NOTES:

- HAND AUGER BORING LOCATION
- GREEN 11-E — SAMPLE LOCATION NAME
- 1.4 @0.5' / 0.036 @1' — SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg) **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-20 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 7,073.56 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 307.01 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 11 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 8 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 10
REMEDIAL EXCAVATION AREA 8
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	DRAWN BY VPB	REVIEWED BY BW	PROJECT NUMBER 74001.0



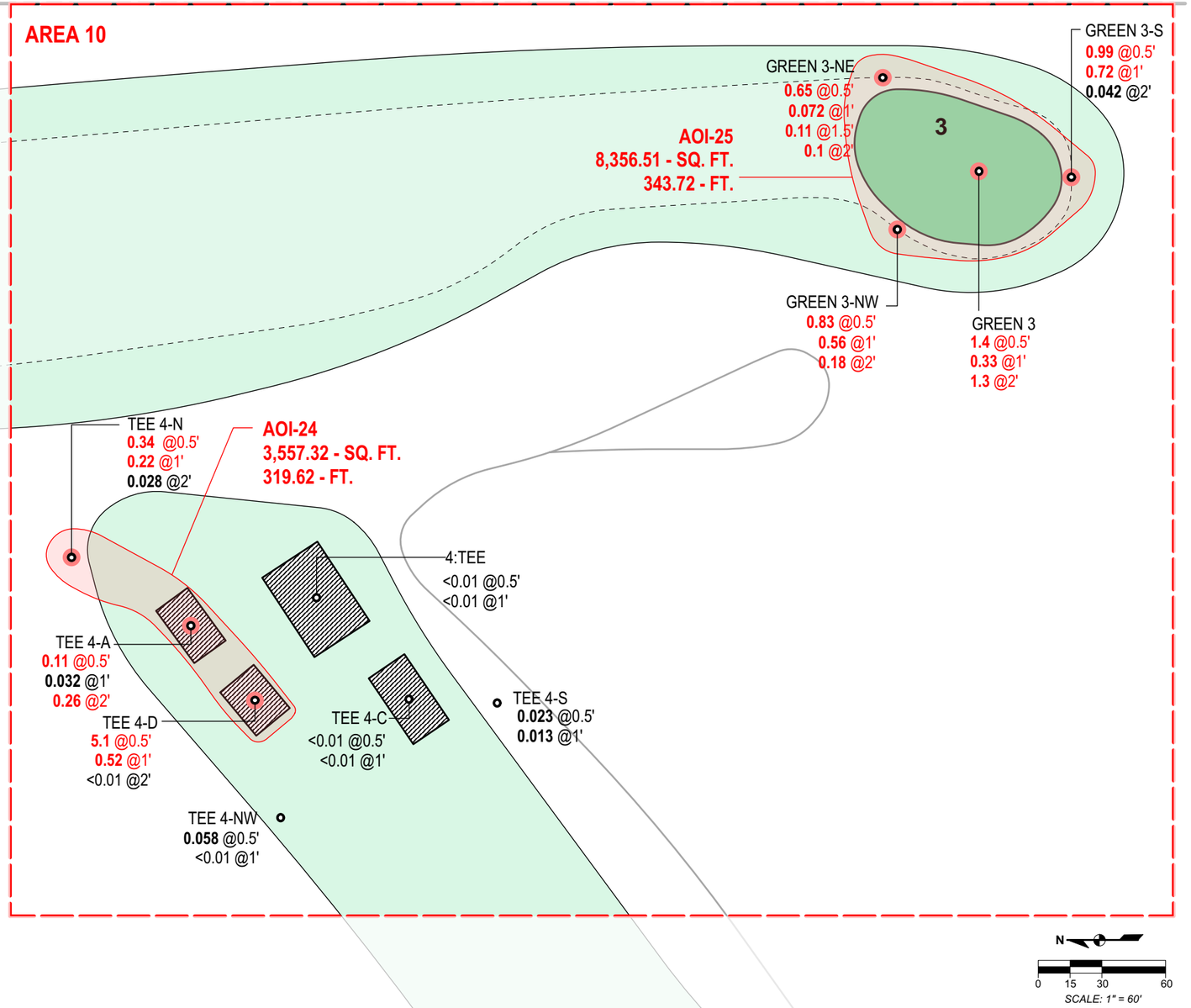
NOTES:

- HAND AUGER BORING LOCATION
- TEE 17-SW — SAMPLE LOCATION NAME
- 4.2 @0.5' — SAMPLE DEPTH IN FEET
- 0.057 @1.5' — SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg) **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-22 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 6,733.78 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 338.94 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 16 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 9 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 11
REMEDIAL EXCAVATION AREA 9
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	**DRAWN BY** VPB	**REVIEWED BY** BW	**PROJECT NUMBER** 74001.0



NOTES:

- HAND AUGER BORING LOCATION
- GREEN 3-S — SAMPLE LOCATION NAME
- 0.99 @0.5' / 0.72 @1' / 0.042 @2' — SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-25 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 8,356.51 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 343.72 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 3 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 10 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 12

REMEDIAL EXCAVATION AREA 10
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0

AREA 11

AOI-26
7,395.70 - SQ. FT.
335.67 - FT.

GREEN 12-E
0.71 @0.5'
0.15 @1'
<0.01 @2'

GREEN 12
1.2 @0.5'
0.16 @1'
<0.01 @2'

12

GREEN 12-S
0.3 @0.5'
0.012 @1'

GREEN 12-W
1.3 @0.5'
0.073 @1'
<0.01 @1.5'

MAINTENANCE AREA

TEE 13-B
4.2 @0.5'
0.22 @1'
0.067 @2'

TEE 13-SE
0.22 @0.5'
0.024 @1'

TEE 13-N
0.54 @0.5'
0.42 @1'
0.02 @2'

AOI-27
16,178.82 - SQ. FT.
554.69 - FT.

13:TEE
<0.010 @0.5'
1.50 @1'
0.27 @1.5'

TEE 13-C
0.081 @2'
0.17 @2.5'

TEE 13-NW
1.3 @0.5'
1.2 @1'
0.97 @2'

TEE 13-SW
0.34 @0.5'
0.13 @1'
0.011 @2'

TEE 13-D-SE
<0.01 @0.5'
<0.01 @1'

TEE 13-D
<0.01 @0.5'
<0.01 @1'

TEE 13-D-SW
<0.01 @0.5'
<0.01 @1'

TEE 13-D-NW
<0.01 @0.5'
<0.01 @1'

GREEN 15-W
<0.01 @0.5'
0.062 @1'

GREEN 15-NE
<0.01 @0.5'
<0.01 @1'

GREEN 15
<0.01 @0.5'
<0.01 @1'

15

AOI-28
492.30 - SQ. FT.
79.04 - FT.

GREEN 15-S
5.9 @0.5'
0.085 @1'
<0.01 @1.5'

TEE 7-NW
<0.01 @0.5'
0.039 @1'

AOI-29
757.67 - SQ. FT.
101.84 - FT.

TEE 16-NE
0.011 @0.5'
<0.01 @1'

TEE 16-A

N

0 15 30 60

SCALE: 1" = 60'

NOTES:

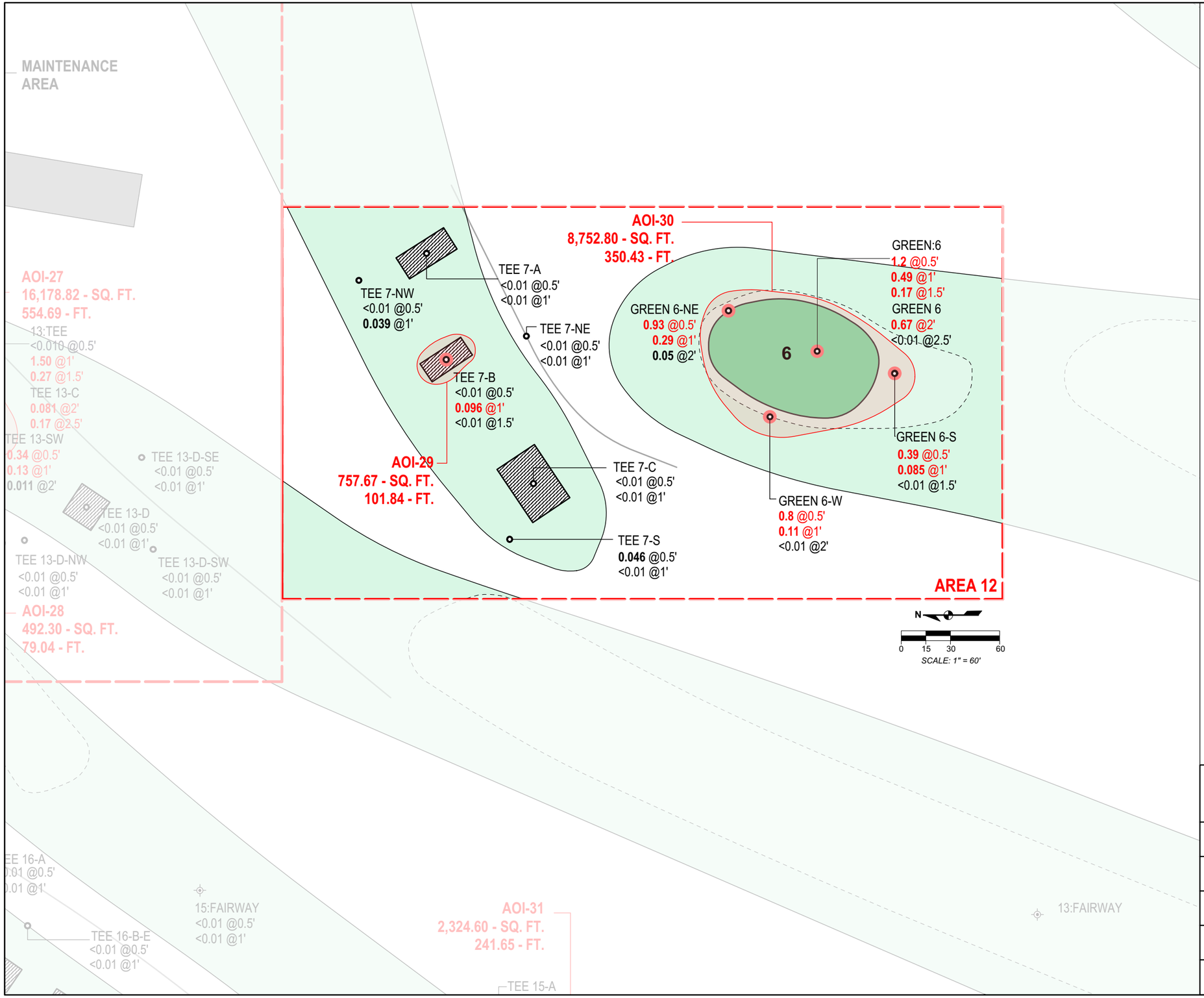
- HAND AUGER BORING LOCATION
- GREEN 12-S — SAMPLE LOCATION NAME
- 0.03 @0.5' — SAMPLE DEPTH IN FEET
- 0.012 @1' — SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg) **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-26 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 7,395.70 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 335.67 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 12 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 11 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 13

REMEDIAL EXCAVATION AREA 11 AND MAINTENANCE AREA
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	epi ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	DRAWN BY VPB	REVIEWED BY BW	PROJECT NUMBER 74001.0



NOTES:

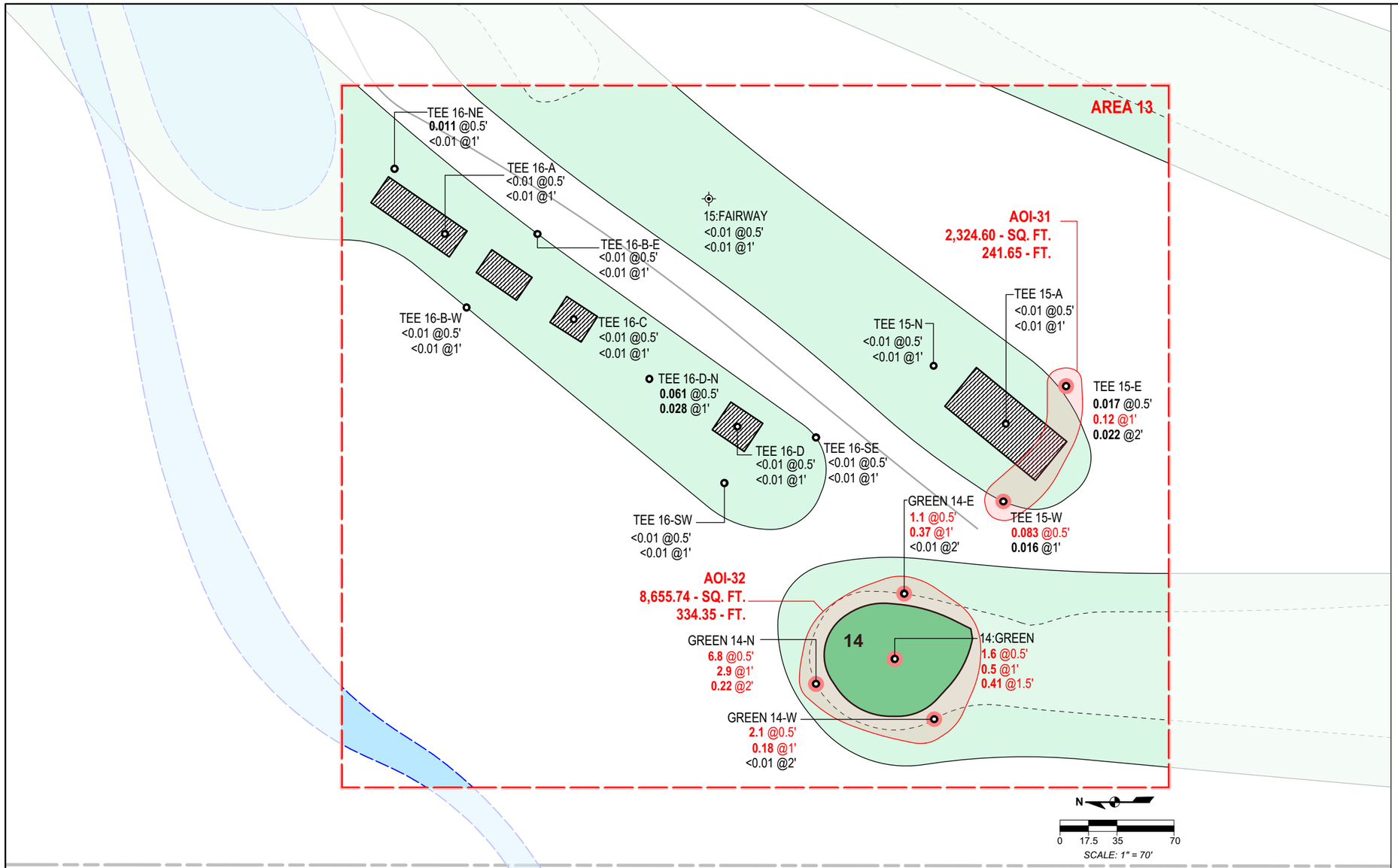
- HAND AUGER BORING LOCATION
- TEE 7-B — SAMPLE LOCATION NAME
- <0.01 @0.5' / 0.096 @1' / <0.01 @1.5' — SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-29 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 757.67 - SQ. FT. / 101.84 - FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.) / APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 6 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 12 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 14

REMEDIAL EXCAVATION AREA 12
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	epi ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	**DRAWN BY** VPB	**REVIEWED BY** BW	**PROJECT NUMBER** 74001.0



NOTES:

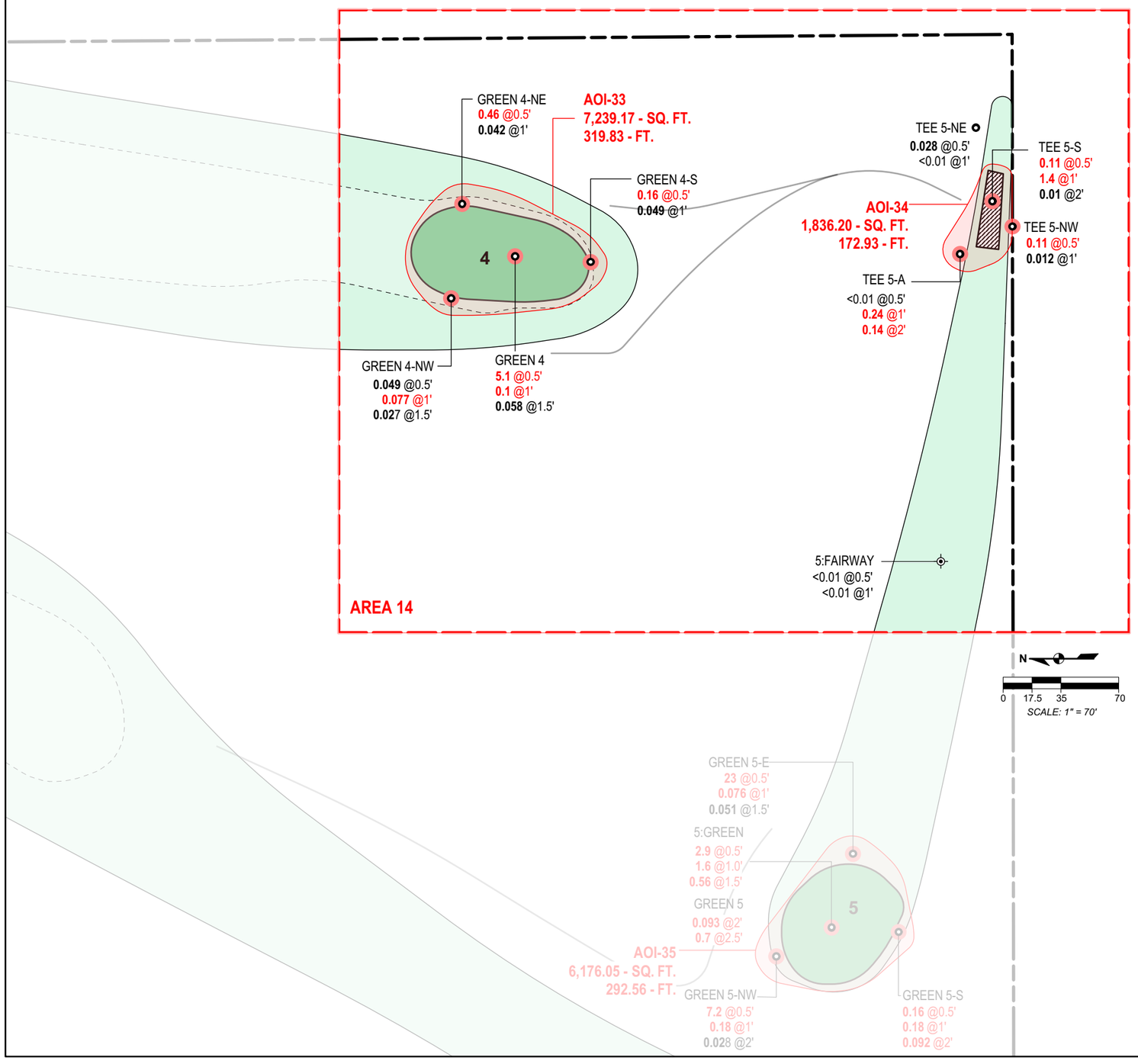
- HAND AUGER BORING LOCATION
- FAIRWAY HAND AUGER BORING LOCATION
- GREEN 14-W — SAMPLE LOCATION NAME
- 2.1 @0.5' / 0.18 @1' / <0.01 @2' — SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-32 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 8,655.74 - SQ. FT. / 334.35 - FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.) / APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 14 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 13 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 15

REMEDIAL EXCAVATION AREA 13
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	**DRAWN BY** VPB	**REVIEWED BY** BW	**PROJECT NUMBER** 74001.0



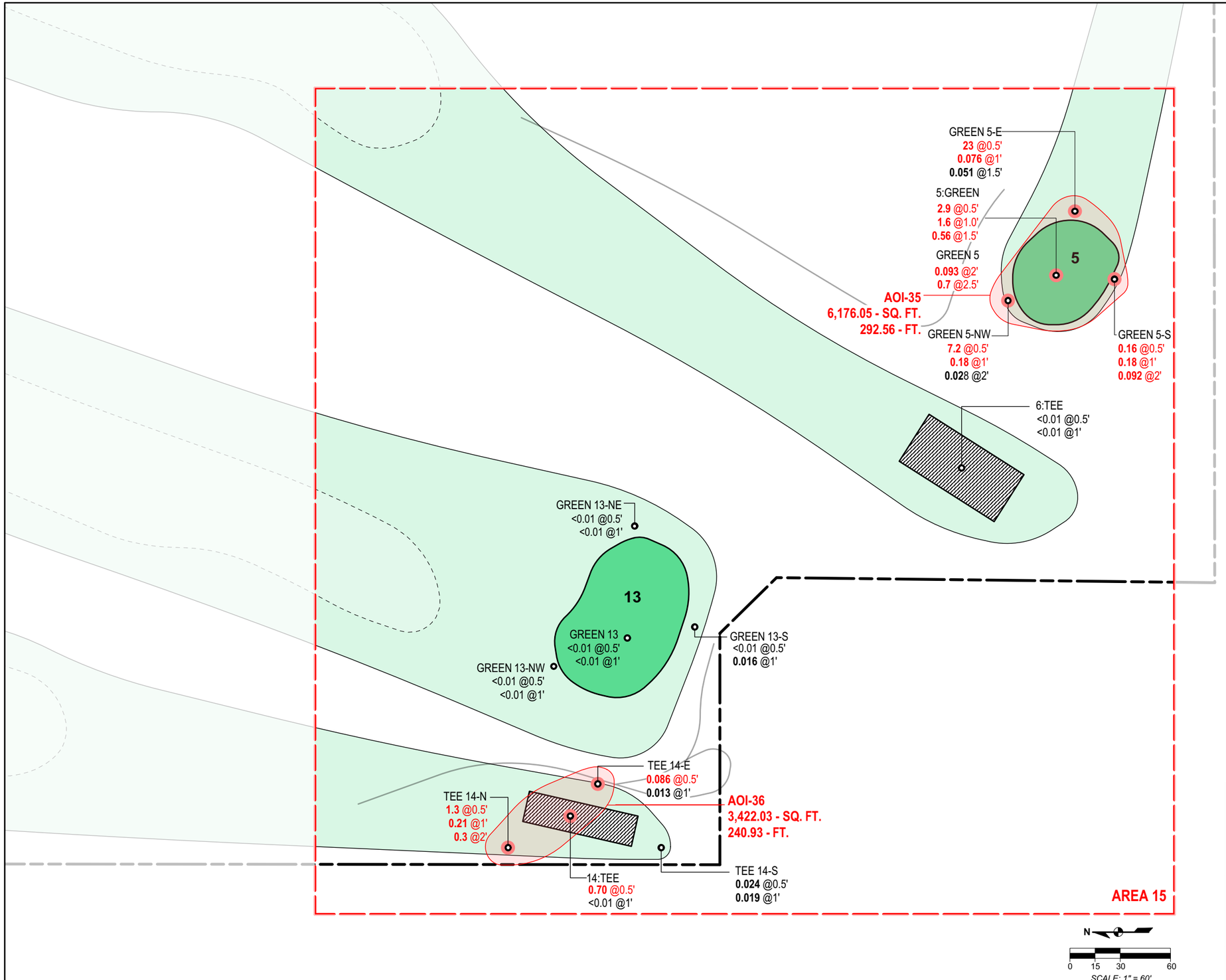
NOTES:

- HAND AUGER BORING LOCATION
- FAIRWAY HAND AUGER BORING LOCATION
- GREEN 4-NW — SAMPLE LOCATION NAME
- 0.049 @0.5' / 0.077 @1' / 0.027 @1.5' — SAMPLE DEPTH IN FEET; SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg)
- **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-33 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 7,239.17 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 319.83 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 4 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE WATER FEATURE
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 14 — FOCAL AREAS OF SOIL SAMPLING

PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 16
REMEDIAL EXCAVATION AREA 14
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	**DRAWN BY** VPB	**REVIEWED BY** BW	**PROJECT NUMBER** 74001.0



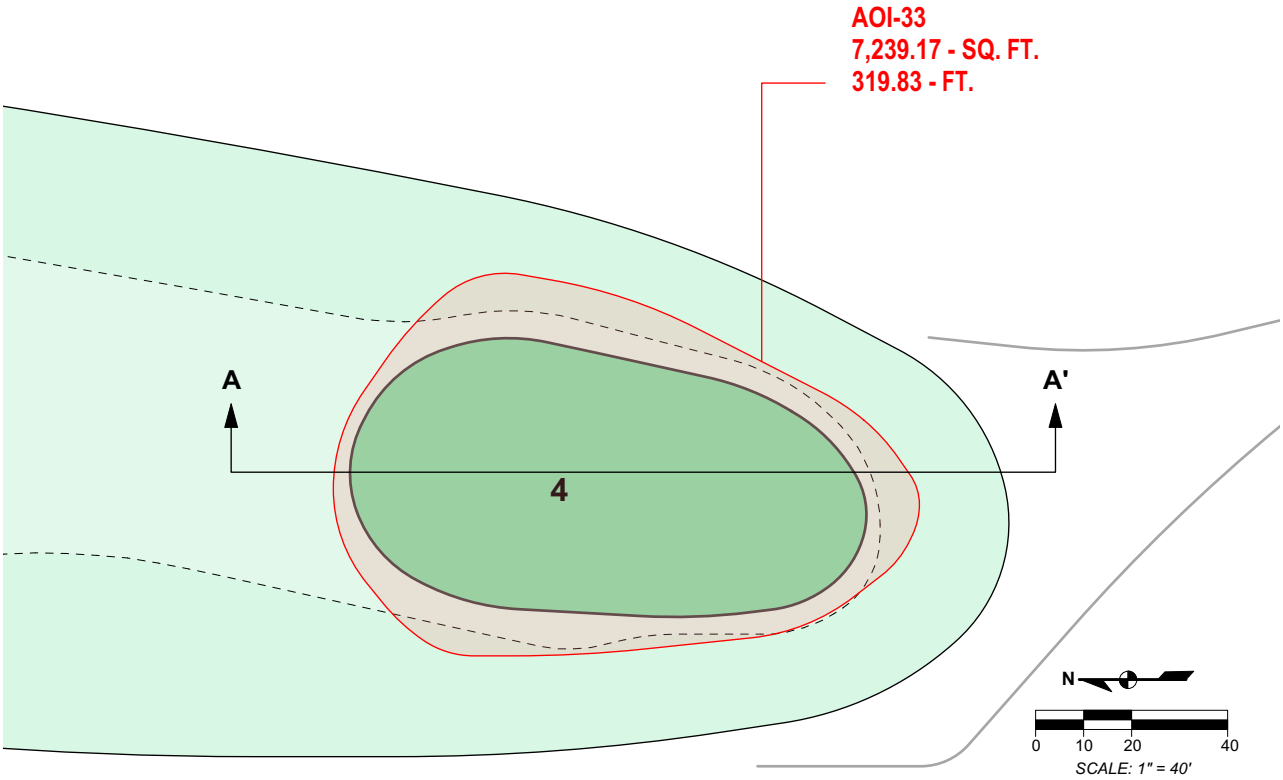
NOTES:

- HAND AUGER BORING LOCATION
- TEE 14-E — SAMPLE LOCATION NAME
- 0.086 @0.5' / 0.013 @1' — SAMPLE DEPTH IN FEET
- SAMPLE CONCENTRATION IN MILLIGRAMS PER KILOGRAM (mg/kg) **BOLD RED** TEXT INDICATES DIELDRIN CONCENTRATIONS IN SOIL EXCEED THE CLEANUP LEVEL (CUL) OF 0.0625 mg/kg
- PINK HALO INDICATES THAT ONE OR MORE CONCENTRATIONS EXCEED THE CUL FOR DIELDRIN IN SOIL
- INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CUL
- AOI-35 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER
- 6,176.05 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)
- 292.56 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)
- GENERALIZED HOLE LOCATION
- APPROXIMATE FAIRWAY LOCATION
- 13 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER
- APPROXIMATE TEE BOX LOCATION
- CART PATH
- APPROXIMATE SUBJECT PROPERTY BOUNDARY
- AREA 15 — FOCAL AREAS OF SOIL SAMPLING

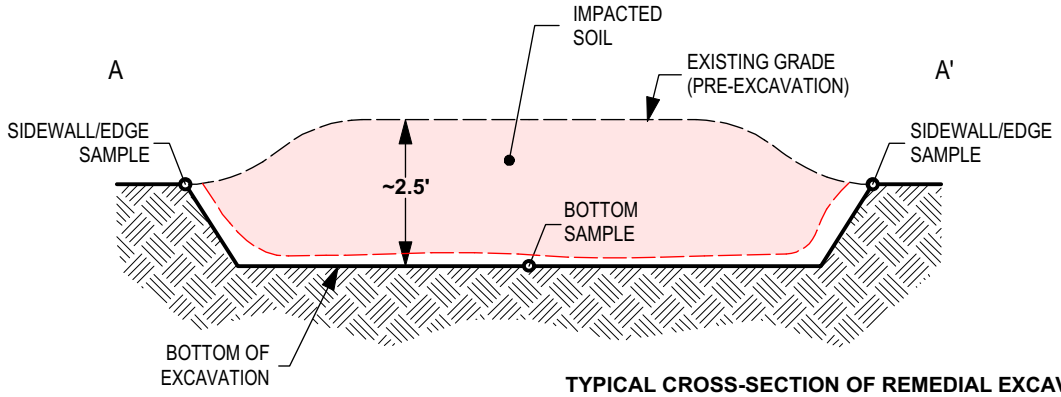
PARCEL BOUNDARIES: PIERCE COUNTY GIS

FIGURE 17
REMEDIAL EXCAVATION AREA 15
ESTIMATED EXTENT OF DIELDRIN IMPACTS TO SOIL

PREPARED BY	ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	DRAWN BY VPB	REVIEWED BY BW	PROJECT NUMBER 74001.0



TYPICAL AREA OF IMPACT (PLAN VIEW)



TYPICAL CROSS-SECTION OF REMEDIAL EXCAVATION

NOT TO SCALE

NOTES:

A — A' CROSS-SECTION INDICATOR

INFERRED AREA OF SOIL WITH DIELDRIN CONCENTRATIONS EXCEEDING THE CLEANUP LEVEL

AOI-33 — AREA OF IMPACT (AOI) AND DESIGNATION NUMBER

7,239.17 - SQ. FT. — APPROXIMATE SURFACE AREA IN SQUARE FEET (SQ. FT.)

319.83 - FT. — APPROXIMATE PERIMETER LENGTH IN LINEAR FEET (FT.)

GENERALIZED HOLE LOCATION

APPROXIMATE FAIRWAY LOCATION

4 — APPROXIMATE GREEN LOCATION WITH HOLE NUMBER

CART PATH

FIGURE 18
TYPICAL CROSS-SECTION OF REMEDIAL EXCAVATION

PREPARED BY	epi ENVIRONMENTAL PARTNERS INC		
REPORT	CLEANUP ACTION PLAN		
LOCATION	1802 BROOKDALE RD E TACOMA, WA		
PREPARED FOR	ICHIJO USA CO., LTD		
DATE 1/16/19	***DRAWN BY*** VPB	***REVIEWED BY*** BW	***PROJECT NUMBER*** 74001.0

Attachment A
Conceptual Site Model

Primary Sources	Contaminants of Potential Concern	Media of Concern	Transport Mechanisms
Lawful application of pesticides	4,4-DDE, 4,4-DDT, B-BHC, D-BHC, Aldrin, Endosulfan I, Endrin, Dieldrin, Endrin, Endrin Aldehyde [X] Adsorbed onto soil [ ] Dissolved in water [ ] Non-aqueous phase	[X] Surface Soil (0–2 feet bgs)	[X] Direct release to soil [X] Migration to subsurface soil [ ] Migration to groundwater [ ] Volatilization [ ] Runoff or erosion [ ] Uptake by plant or animal [ ] Other (list) _____
		[X] Soil (> 2 feet bgs)	[X] Direct release to soil [ ] Migration to groundwater [ ] Volatilization [ ] Other (list) _____
		[ ] Groundwater	[ ] Release to groundwater [ ] Volatilization [ ] Future migration to surface water [ ] Future migration to sediment [ ] Uptake by plant or animal [ ] Other (list) _____
		[ ] Surface Water	[ ] Release to surface water [ ] Volatilization [ ] Sedimentation [ ] Uptake by plant or animal [ ] Other (list) _____
		[ ] Sediment	[ ] Release to surface water [ ] Resuspension or erosion [ ] Uptake by plant or animal [ ] Other (list) _____

Exposure Media	Exposure Pathway	Current (C) and Potential Future (F) Receptors: Commercial Industrial	Construction Worker	Residential/ Recreational	TEE Receptors
[x] Soil	[x] Ingestion		C/F	C/F	C/F
	[x] Dermal Exposure		C/F	C/F	C/F
[ ] Groundwater	[ ] Ingestion				
	[ ] Dermal Exposure				
[ ] Air	[ ] Inhalation				
[ ] Surface Water	[ ] Ingestion				
	[ ] Dermal Contact				
[ ] Sediment	[ ] Ingestion				
	[ ] Dermal Contact				
[ ] Indoor Air	[ ] Inhalation				

NOTES:
bgs = below ground surface

Attlachment A
CONCEPTUAL SITE MODEL

PREPARED BY	epi ENVIRONMENTAL PARTNERS INC		
REPORT	Cleanup Action Plan		
LOCATION	1802 Brookdale Road East, Tacoma, Washington		
PREPARED FOR	Ichijo Co. USA, LTD.		
DATE 12/18/18	***DRAWN BY*** BJW	***REVIEWED BY*** TCM	***PROJECT NUMBER*** 74001.1

Attachment B
Remediation Drainage Report

AZURE | GREEN CONSULTANTS

+feasibility +planning +engineering +surveying

Brookdale PDD

REMEDIATION PLAN

Drainage Report

SITE: 1802 Brookdale Rd E

FOR/CONTACT

Ichijo USA Co., Ltd.
Contact: Randy Barnett
15135 NE 90th St., Ste 200
Redmond, WA 98052
425.497.0616
randy@ichijousa.com

BY

Robert Trivitt, PE
Azure Green Consultants
409 East Pioneer
Puyallup, WA 98372
253.770.3144

DATE

September 25, 2018

JOB NO

2538

I hereby state that this Drainage Control Plan for Brookdale Remediation Plan has been prepared by me or under my supervision and meets the standard of care and expertise which is usual and customary in this community for professional engineers. I understand that Pierce County does not and will not assume liability for the sufficiency, suitability, or performance of drainage facilities prepared by me.

TABLE OF CONTENTS

Appendices:

Section 1 - Proposed Project Description

Overview:

Permit Type: Grading

Site Address: 1802 Brookdale Rd E, Tacoma, WA 98445

Parcel Numbers: 031915-8-700, 031915-4-158, 031915-8-002, 031915-8-003, 031915-1-066, 031922-5-700, 031922-5-701, 031922-5-007, 031922-2-019

Description:
Tax Parcels 031915-8-700, 031915-8-002, 031915-8-003, 031922-5-700, 031922-5-701, 031922-5-007:
Lot 2 of Short Plat recorded December 9, 1991 under Recording No. 9112090414, records of Pierce County;
EXCEPT that portion thereof conveyed to Pierce County for additional right of way for Brookdale Road East by Quit Claim Deed recorded December 4, 1991 under Recording No. 9112040406, records of Pierce County;
ALSO, excepting therefrom, that portion of Lot 2 Quieted by Stipulation and Agreed Order Quieting Title entered July 15, 2005 in Superior Court Cause No. 04-2-13936-3;
Situate in the County of Pierce, State of Washington.

Tax Parcel 031922-2-019:
Beginning at a stone monument at the center of Section 22, Township 19 North, Range 3 East of the W.M.; Thence on the center line of said section South 89°21' East 316.5 feet to the West line of private road conveyed to Matthew Mahn by deed recorded under Auditor's Fee No. 362800; Thence North 0°35'East 489.91 feet to South line of the Christopher Mahon Donation Land Claim; Thence on said South line West 914.36 feet to the East line of private road; Thence South 0°21' East 479.93 feet to said center line of Section; Thence on said center line South 89°21' East 590 feet to Point of Beginning;
Except the South 30 feet for John Mahon County Road;
Also except the East 575 feet thereof;
Situate in the County of Pierce, State of Washington.

Tax Parcel 031915-1-066:
Parcel a of boundary line adjustment recorded on May 18, 1990, under recording no. 9005180393, records of Pierce County, being further described as follows:
Commencing at the stone monument at the intersection of the north line of Charles Mahon D.L.C. no. 48 with the north-south quarter section line of section 15, Township 19 North, Range 3 East, W.M.; thence along said quarter section line south 00 degrees 38 minutes 30 east, 165.00 feet; thence south 78 degrees 43 minutes 30 seconds east, 20.39 feet to a line 20 feet east of and parallel with said quarter section line; thence south 00 degrees 38 minutes 30 seconds east, 21.00 feet to the centerline of creek and the true point of beginning; thence south 77 degrees 08 minutes 00 seconds east, 237.74 feet along said creek and creek extended; thence south 0 degrees 38 minutes 30 seconds east, 537.56 feet; thence south 89 degrees 21 minutes 30 seconds west, 231.16 feet; thence north 0 degrees 38 minutes 30 seconds west, 593.09 feet to the true point of beginning.

Tax Parcel 031915-4-158:
Commencing at the intersection of the north line of the Christopher Mahon Donation Land Claim no. 48, and the north-south section line of section 15, Township 19 North, Range 3 East of the W.M., in Pierce County, Washington; thence south 0 degrees 38 minutes 30 seconds east along said quarter section line 165 feet; thence south 78 degrees 43 minutes 30 seconds east 20.39 feet to a line parallel with and 20 feet east of said quarter section line; thence south 0 degrees 38 minutes 30 seconds east 614.09 feet to the southwest corner of a tract of land conveyed to Pierce County Fire District No. 6 by deed recorded under auditor's no. 8409070246 and the true point of beginning; thence continue south 0 degrees 38 minutes 30 seconds east 633 feet, more or less, to the southwest corner of a tract of land conveyed to John F. Krause and Robert C. Pollock by deed recorded under auditor's no. 893543; thence east along the south line of said tract 251.77 feet to the southeast corner thereof; thence north along the easterly line of said tract to the southeast corner of the above mentioned Pierce County Fire District tract; thence south 89 degrees 21 minutes 30 seconds west along the south line thereof 251.16 feet to the true point of beginning.
Situate in the County of Pierce, State of Washington.

Zoning:

031915-8-700, 031915-4-158, 031915-8-002, 031915-8-003, 031915-1-066, 031922-5-700, 031922-5-701, & 031922-5-007: RR, Parkland-Spanaway-Midland Community Plan

031922-2-019: MSF, Parkland-Spanaway-Midland Community Plan

Project Description:
Ultimate project to consist of a 155.49-acre site subdivided into 388 residential lots, 2 commercial lots and 78 tracts. The site is currently used as a golf course.

The scope of work under this application consists of grading for the removal of contaminated soils. Tests have shown that the soils at the tee box and greens areas of the golf course are contaminated with the pesticide Dieldrin and therefore must be removed for proper disposal. Based on recommendations from Environmental Partners Inc., specific areas and depths of excavation have been established as shown on the construction plans. There are 41 distinct areas to be graded ranging in area from 53 to 15,243 square feet, in depth from 1 to 2.5 feet, and in volume from 3 to 1,411 cubic yards. Total area to be graded is 216,258 sf (4.96 ac) and total volume is 12,868 cy.

Calculation Summary:

Since all grading is excavation, no BMPs are required and therefore there are no calculations.

BMPs utilized:

None

Project Requirements:

Determination of Applicable Minimum Requirements

The project is new development. There are no new or replaced hard surfaces. The disturbed areas are greater than 7,000 square feet; therefore the project shall comply with Minimum Requirements (MR) #1 through #5 for the land disturbed, per Section 2.3.1 of Volume I of the Pierce County 2015 Stormwater Management and Site Development Manual (hereinafter "the Manual"). Because there are no new or replaced hard surfaces, and the existing land cover being disturbed is already lawn, no other Minimum Requirements apply. Since more than 250 cubic yards of material is to be moved, a Drainage Control Plan and SWPPP are required per Table 3.1 of Volume I of the Manual.

Discussion of Minimum Requirements

Minimum Requirement #1: Preparation of Stormwater Site Plans

To satisfy this requirement a Drainage Control Plan will be prepared to show the how the Minimum Requirements are addressed. The Drainage Control Plan will consist of the construction plans, a Drainage Report, and a SWPPP Narrative. Typically, a Maintenance and Source Control Manual would also be required, but since no drainage facilities are required for this project, neither is a Maintenance and Source Control Manual.

Minimum Requirement #2: Construction Stormwater Pollution Prevention

To satisfy this requirement a SWPPP will been prepared consisting of a narrative and the construction plan.

Minimum Requirement #3: Source Control of Pollution

Since no storm facilities are to be constructed and the use of the site is not changing under this phase of the project, a Maintenance and Source Control Manual is not required. One will be provided when engineering plans are submitted for the plat.

Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls

Clover Creek runs across the south half of the site and the North Fork Clover Creek Tributary 1 (NFCCT1) runs across the north quarter of the site. The south two-thirds of the site drains to Clover Creek and the north third of the site drains to NFCCT1. All of the excavated areas will be left as minor depressions. As a result, this phase will preserve the natural drainage system.

Minimum Requirement #5: On-site Stormwater Management

Per Figure 2.3 of Volume I of the Manual, since the project triggers only MR #1-5, the project can either met the LID Performance Standard, or consider BMPs in order for each surface per List #1. This project will utilize List #1.

Lawn and Landscaped Areas:

1. Since the project only consists of excavation, any runoff will be retained within the individual depressions created. Therefore, soil preservation and amendment BMP in Volume III, section 3.1 is not necessary. The depressions will be eliminated, and this BMP will be applied as part of the site grading plan for the plat.

Roofs:

There are no roofs proposed for this phase of the project.

Other Hard Surfaces:

There are no other hard surfaces proposed for this phase of the project.

Section 2 - Existing Conditions

Topography:

The south two-thirds of the site slopes down to Clover Creek running from east to west across the south half of the site. The north third of the site slopes down to NFCCT1 running from east to west across the north quarter of the site. The average slope is less than 2%. The steepest slope is between 8-15% with less than 8 feet of fall and is located in a break line at the north third of the site.

Ground Cover:

The site is used as a golf course and is primarily covered with lawn. There are scattered trees throughout the site.

Drainage:

Any surface runoff will sheet flow to Clover Creek in the south half of the site or NFCCT1 on the north quarter of the site.

Section 3 - Infiltration Rates/Soil Reports

The NRCS Soil Survey of Pierce County has mapped the majority of the site as Spanaway gravelly sandy loam (41A) with the north 900 feet mapped as Spana loam (40A). Spanaway soils are classified as hydrologic group A, which are highly permeable. Spana soils are classified as hydrologic group D, which are typically not suitable for infiltration.

An infiltration feasibility report dated June 19, 2017 was prepared by GeoResources. This report indicates soils at all of the test locations are weathered outwash over recessional outwash. The soils are texturally described as sandy gravel. No significant variation was found in the test pits on the northern 900 feet of the site from those on the majority of the site. The GeoResources report recommends a design infiltration rate of 2 inches per hour for the upper, weathered outwash soils and 30 inches per hour for the deeper recessional outwash soils. Seepage was found in four of 10 test pits. The shallowest seepage was found at 3.5 feet in one test pit, 9 or 10 feet in the others. Based on this data, infiltration of runoff from impervious surfaces is feasible with a design rate of 2 inches per hour.

The GeoResources report also states that the native soils meet the requirements for water quality treatment via infiltration. Therefore, infiltration trenches may be used for treatment without an additional treatment soil layer.

Based on the GeoResources report, downspout infiltration trenches are feasible to fully infiltrate runoff is feasible with a minimum depth of 2.5 feet and up to a depth of 5.5, and should be sized using the Gravel/Type A (60 in/hour) sizing table from Table 3.5 of Volume III of the Manual.

Section 4 - Wells and Septic Systems

There is an existing irrigation well near the west property line. The applicant intends to maintain the use of this well for irrigation of tracts pending agreement by water companies. The project will be served with water by Spanaway Water and Parkland Light and Water.

There are existing residences with existing septic systems on the project site. It is expected that these houses will connect to sanitary sewer. The project will be served with sanitary sewer by Pierce County. Any existing septic systems found onsite will be decommissioned per TPCHD requirements.

Section 5 - Fuel Tanks

There are no known fuel tanks on the project site.

Section 6 - Sub-Basin Description

The area in the vicinity of the project site is primarily developed as moderate density, single-family residential. At the north end of the site there is a condominium development and a mobile home park. Land cover is typically residential landscaping with some areas of second growth forest or brush on undeveloped properties.

Section 7 – Flood Plain Analysis

A flood boundary delineation survey has been approved by Pierce County under application 878843.

There is a floodway and AE flood zone along Clover Creek. The 100-year flood elevation varies from 317.5 at the west property line to 319.4 at the east property line.

There is a floodway and AE flood zone along NFCCT1. The 100-year flood elevation varies from 319.8 at the west property line to 329.7 at the east property line. This flood zone jumps the stream channel and has a leg that runs south of the NFCCT1 with a flood elevation of 320.10 at the west property line.

This phase includes excavations within the floodplain. No fill will occur, so no additional restrictions are required.

Section 8 - Aesthetic Considerations for Facilities

There are no facilities proposed for this phase of the project.

Section 9 - Facility Sizing and Downstream Analysis

Facility Sizing

There are no facilities required for this phase of the project.

Downstream Analysis

Surface water, if any, from the site, will sheet flow to Clover Creek or NFCCT1 per the description of topography above. These NFCCT1 joins Clover Creek about 5,000 feet west of the site. Both channels have 100-year floodplains beyond the channel for the essentially the entire length to the merger. The area around the two stream channels are also mapped as wetlands for at least 50% of these runs. Approximately 3,800 feet west of the site, the floodplain branches out of the channel into the "Parkland Overflow". This overflow flows northeast across Parkland, merging back with Clover Creek near the intersection of 10th Ave S and 131st St S. Clover Creek continues west crossing JBLM and the City of Lakewood, reaching Steilacoom Lake. Steilacoom Lake releases to the north through Chambers Creek which flows north to the boundary between City of Lakewood and City of University Place, then west to the Chambers Creek Reservoir and ultimately Puget Sound.

Section 10 – Utilities

Existing utilities are located in Brookdale Road East on the north side of the site and 152nd Street East on the south side of the site. There is no utility construction proposed for this phase of the project.

Section 11 - Covenants, Dedications, Easements

No covenants, dedications, or easements are required for this phase of the project.

Section 12 - Property Owners Association Articles of Incorporation

A homeowners association is not required for this phase of the project.

Section 13 - Other Permits or Conditions Placed on the Project

The project is being reviewed as a PDD with SEPA review under application 869967. This process will result in conditions placed upon the project.

A shoreline review under application 869972 potentially will result in conditions.

A mitigation plan is required for the proposed stream crossing and is currently under review under application 892689.

A wetland delineation report will be required.

A site development permit will be required.

A sewer line extension permit will be required.

Water plan approval will be required.

Decommissioning of any existing septic systems will require approval by TPCHD.

NPDES coverage from DOE will be required for the full site grading phase of the project.

A flood boundary delineation survey is required and is currently under review by Pierce County.