January 23, 2024

Washington Department of Ecology
Southwest Regional Office Toxics Cleanup Program
PO Box 47775
Olympia, Washington 98504

Subject: Lakewood Towne Center - Response to Ecology Comments on December 14, 2023, Opinion Letter.

Site Name: Lakewood Towne Center
Site Address: 6020-6030 Main Street Southwest, Lakewood, Washington 98499
Facility/Site ID: 7922231
Cleanup Site ID: 421
VCP Project ID: SW1801

Dear Joseph Hunt,

This letter serves to provide additional details and answers to comments and questions from Ecology in the December 14, 2023 Opinion Letter regarding the review of Herrera's Work Plan (October 16, 2023) for proposed groundwater treatment and monitoring at the Lakewood Towne Center Site (see Attachment A, Figure 1).

## Regarding Ecology comments for Section 2.a. Proposed Monitoring Well Network Locations:

Per the Soil Vapor Intrusion Guidance, Herrera proposes installing two additional shallow groundwater monitoring wells (MW-9 and MW-10) to the north and northeast of the former Plaza Dry cleaners as part of a Tier 1 evaluation in the proximity of 5815 Lakewood Towne Center Boulevard (see Attachment A, Figure 2). Soil samples will be collected and field screened for VOCs as the borings are advanced. In addition, one round of groundwater sampling, including MW-9 and MW-10, will be performed to evaluate groundwater results, specifically halogenated volatile organic compounds (HVOCs) against vapor intrusion groundwater screening levels, in the proximity of 5815 Lakewood Towne Center Boulevard. Following the evaluation of the initial groundwater results at MW-9 and MW-10, if no HVOC results exceed their respective vapor intrusion groundwater screening levels, no further groundwater sampling will be performed. If groundwater results for HVOCs from MW-9 and MW-10 exceed the applicable vapor intrusion groundwater screening levels, soil vapor probes will be installed between the wells and the building at 5815 Lakewood Towne Center Boulevard as part of an expanded Tier I Evaluation.

## Regarding Ecology comments for Section 2.b. HVOC Degradation at the Site:

The goal of the proposed groundwater treatment described in the Work Plan is to reduce the concentration of residual vinyl chloride (VC) in groundwater. The remediation proposal, as outlined by Tersus Environmental in the Work Plan, includes monitoring critical parameters specific to the remediation approach, including field parameters (DO, ORP, pH, temperature, specific conductivity, and water levels) and lab geochemistry for constituents of concern (PCE/TCE/DCE/VC, etc.) plus total organic carbon (TOC), Nitrate, Iron, Manganese, Sulfate, Methane, Ethane, and Ethene. Additional evaluation includes specialized quantitative polymerase chain reaction (qPCR) tests for Dhc/vcrA/bvcA/tceA, etn, etnE, and potentially specialized compound specific isotope analysis (CSIA) for $d^{13}C$-VC. Following conversations with Herrera regarding the scope of the work plan, Tersus has indicated other parameters cited by Ecology are useful but not critical to this 6-month to 2-year performance monitoring scope.

Regarding the subset of the well network that will be used to evaluate the remedy, Section 4.4.5 of the Work Plan and SAP Table 4-1 describe the proposed post-groundwater treatment sampling:

> "Following the baseline sampling event and subsequent groundwater treatment, groundwater monitoring will occur for six quarterly events to monitor and evaluate the impacts of the proposed groundwater treatment. Post-injection groundwater monitoring will begin approximately one month following groundwater treatment activities. During each quarterly sampling event, Herrera will collect static water levels from the 11 monitoring wells and will collect groundwater samples from 10 monitoring wells at the Site, excluding MW-3. All groundwater samples will be analyzed for HVOCs, including PCE and its breakdown products (CVOCs). Geochemical parameters including total organic carbon (TOC), total sulfate, dissolved iron and manganese, total nitrogen, and total phosphorus will be analyzed from source area wells MW-1S and MW-1M for the first three quarters of post-injection groundwater sampling."

From the SAP:

**Table 4-1 Samples to be Collected at Lakewood Towne Center.**

| Sampling Location | Sample Type | Maximum Number of Samples | Analytical Requirements |
|---|---|---|---|
| Soil borings for MW-4M, MW-5M, MW-7S, MW-8D | Soil sample | 9: Two samples from each of 4 borings plus 1 field duplicate | Halogenated VOCs (including PCE and daughter products) |
| Groundwater monitoring wells MW-1S, MW-1M, MW-1D, MW-2D, MW-4, MW-4M, MW-5, MW-5M, MW-7S, MW-8D | Groundwater sample | 77 Samples: One from each of 10 wells x 7 events (70) plus 1 duplicate per event | Halogenated VOCs (including PCE and daughter products) |
| Groundwater monitoring wells MW-1S, MW-1M | Groundwater sample | 8: One from each of 2 wells x baseline plus 3 events (8) | TOC, Sulfate, Fe and Mn (Dissolved), N and P (Total) |

The two wells where treatment will be performed (MW-1S and MW-1M) will also be used to monitor the effectiveness of the treatment.

In addition, data will be updated to be evaluated against the more conservative Method B vapor intrusion groundwater screening level for TCE.

Regarding Ecology comments for Section 2.c. Villa One-Hour Cleaners/MW-3:

Since Kite Realty Group does not own the former Villa Cleaners parcel near MW-3, a Tier 2 soil vapor evaluation will not be performed at this location under the proposed Work Plan (see Attachment B).

Regarding Ecology comments for Section 2.d. Proposed In-Situ Chemical Oxidation (ISCO) Groundwater Remediation:

Prior to injection of groundwater amendments/reagents, proper UIC permits will be obtained and all UIC conditions imposed by the UIC registration will be adhered to.

The contracted driller (Holocene) will mix reagents for injection. The injection solution will be mixed in a 300-gallon portable water tank on site with potable water obtained from a nearby spigot at the mall. Holocene will use the 300-gallon poly tote to mix the TersOx™ liquid, hydrogen peroxide (34.5%) with the TersOx™ modulator (surfactant) and water, and then inject into the wells. A second injection consisting of water and TersOx™ Nutrients-QR will follow the first.

The driller will use a diaphragm pump operating at approximately 35–50 psi to inject the nutrients into the wells.

Daylighting and upwelling will be visually monitored at the ground surface in the vicinity of the wells where the treatment solutions are injected. The native loose Steilacoom sands and gravels should have plenty of pore space to receive the treatment fluids; daylighting and upwelling is therefore not anticipated.

After hydrogen peroxide injections, a 6-month performance monitoring period should suffice to track oxygen and ORP levels over time and a potential shift in microbial population. Although solvent biodegradation is a relatively slow process, short sampling frequencies (in the order of weeks to months) are initially required to confirm injectate half-life and ultimately if degradation (typically verified through CSIA, increase in specific microbial populations) is associated to the injection event and likely contaminant concentration drops. Results will help determine if additional injections are required and at what frequency. Waiting too long could allow matrix back diffusion, upgradient mass flux, or other steady state conditions to mask the impact of the injection effort.

Following responses to this letter, Herrera will update the original Work Plan from October 2023 to include the expanded scope of work to install and monitor proposed monitoring wells MW-9 and MW-10, update data tables to show a more conservative screening level for TCE in groundwater using the more conservative Method B vapor intrusions groundwater screening level, and add details to the scope of work for field activities surrounding injection activities and subsequent monitoring.

If we can provide any additional details regarding the proposed Work Plan, please do not hesitate to contact us.

Sincerely,

Herrera Environmental Consultants, Inc.

Shannon McKernan
Scientist III

Enclosure:

cc: Tony Halsey, Kite Realty Group

Sara Abdelrahman, Kite Realty Group

# Attachment A

## Vicinity Map and Site Map

HERRERA
Science + Planning + Design

HERRERA
Science + Planning + Design

# Figure 1.
# Vicinity Map.


Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: WSDOT, Pierce County, Esri Clarity (Imagery, 2022)

0 0.25 0.5 1 Miles

File Path: K:\Projects\Y2021\21-07668-000\Pro\Lakewood_Towne_Center_Monitoring\Lakewood_Towne_Center_Monitoring.aprx\Fig1_Vicinity
Date: 9/27/2023
Author: bBagniewski

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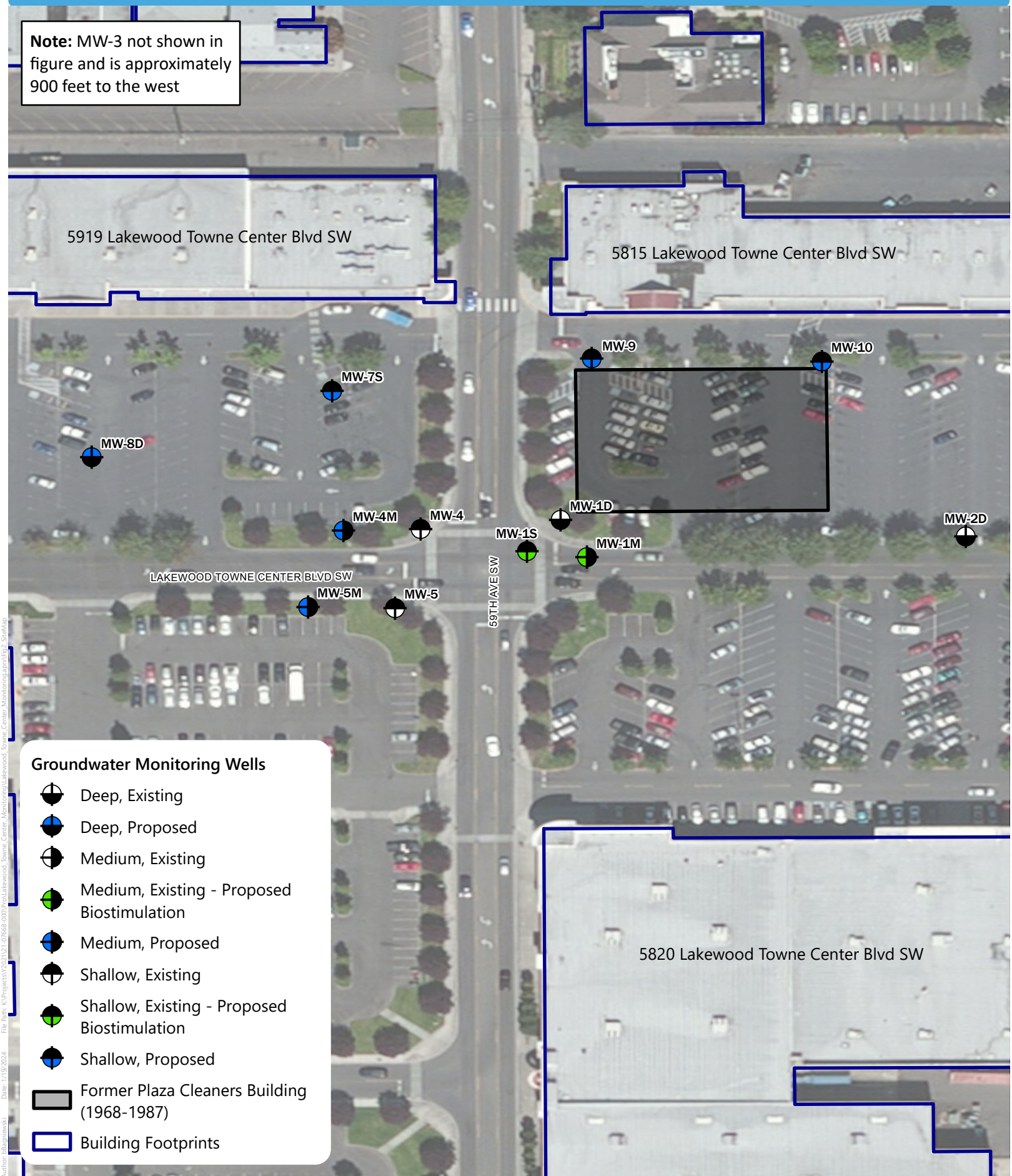
# Figure 2.
# Site Map and Proposed Groundwater Monitoring Locations.




Produced by Herrera Environmental Consultants (herrerainc.com) | Sources: Pierce County, Microsoft, Esri Imagery (2022)

0 37.5 75 150 Feet

File Path: K:\Projects\Y2021\21-07668-000\Pro\Lakewood_Towne_Center_Monitoring\Lakewood_Towne_Center_Monitoring.aprx\Fig2_SiteMap
Date: 1/19/2024
Author: bBagniewski

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# Attachment B

## Ownership Figure

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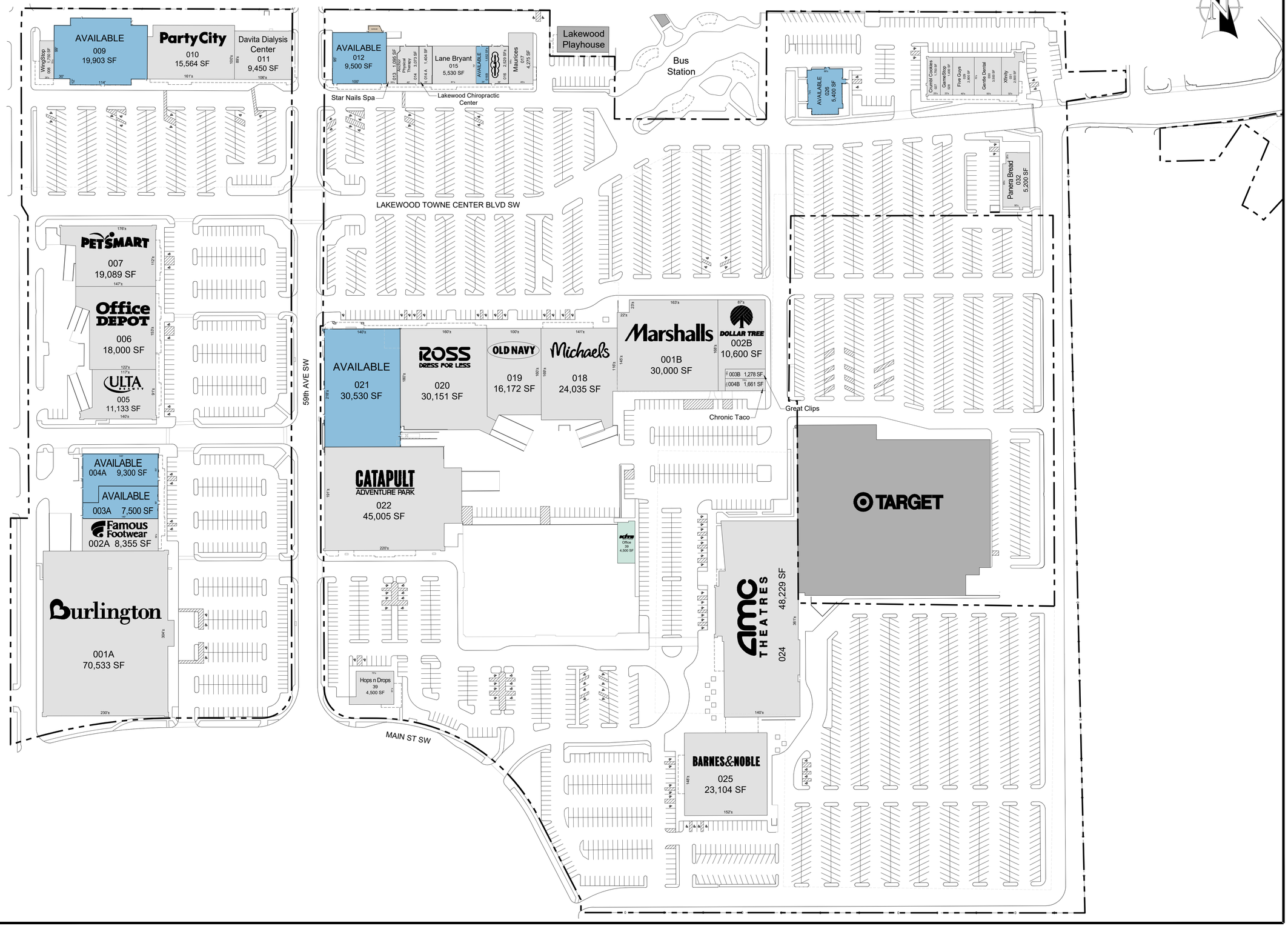



KITE REALTY GROUP

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**SITE DATA**

| | | |
|---|---|---|
| Burlington | 70,533 | SF |
| Ulta | 11,133 | SF |
| Office Depot | 18,000 | SF |
| Petsmart | 19,089 | SF |
| Available | 19,903 | SF |
| Party City | 15,564 | SF |
| Marshalls | 30,000 | SF |
| Michaels | 24,035 | SF |
| Old Navy | 16,172 | SF |
| Ross | 30,151 | SF |
| Available | 30,530 | SF |
| Catapult Adventure Park | 45,005 | SF |
| Barnes & Noble | 23,140 | SF |
| AMC Theatres | 48,229 | SF |
| Retail | 105,993 | SF |
| Total GLA | 507,477 | SF |
| Parking | 3,015 | |
| Parking Ratio | 5.94 | \1000 |
| Center Acreage | 55.66 | AC± |

**NOTE: Negotiations with the stores listed and others not listed are in progress. No guarantee can be made that the listed stores will open in the center. All conditions and dimensions are subject to variation due to actual field conditions. All dimensions and areas shown should be verified prior to lease execution. This plan is preliminary and subject to change. Sheet size 24x36.**

# LAKEWOOD TOWNE CENTER LAKEWOOD, WASHINGTON

| | |
|---|---|
| Drawn By: MLR | CHKD: |
| Date: 01/15/2024 | Scale: 1" = 80' |

**CURRENT PLAN**

| | |
|---|---|
| Project No. 5629 | **CP** |


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