

**Executive Summary
Draft Cleanup Action Plan
Former Chevron Bulk Plant 100-1327
Facilities North/King County Metro Transit Lake Union Site**

Seattle, Washington

Prepared for

**Chevron Products Company
and
King County Metro Transit**

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This Cleanup Action Plan (CAP) presents the proposed cleanup actions under the Model Toxics Control Act (MTCA) for the Former Chevron Bulk Terminal #100-1327 currently owned by King County Metro Transit (Metro) for the Facilities North Site (Site) located along the north shore of Lake Union in Seattle, Washington (Figure 1). The site totals approximately three acres and consists of the North and South Yards. At this time, Metro plans to retain ownership and does not plan to alter the current industrial-commercial use of the site.

A number of investigations have been conducted at the site. The most comprehensive investigation was the remedial investigation/feasibility (RI/FS) study conducted by Associated Geotechnology Inc. (AGI) under contract with Metro (AGI Draft RI/FS, 1993). The RI/FS characterized the nature and extent of specific chemical compounds in soil and groundwater resulting from activities at the site and developed and evaluated cleanup action alternatives. Supplemental investigations were conducted by AGI, Pacific Environmental Group (PEG) and Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) to augment existing site data and to develop site-specific cleanup levels for soil and groundwater.

The site is underlain primarily by glacial till, recessional sand, and fill material. Twenty-seven groundwater wells, installed to a depth of 20 to 40 feet below ground surface (bgs), are currently present at the site. The first occurrence of groundwater beneath the site is currently approximately 2 to 11 feet bgs. The groundwater is present within a discontinuous, semi-confined, water-bearing unit within the upper portion of the till. The direction of groundwater flow within this unit is to the south-southwest towards Lake Union. Aquifer testing conducted at the site indicates a sustained yield estimated at 2 gallons per minute (gpm) and ranging from 0.5 to 3 gpm. Washington State Department of Ecology (Ecology) has determined that this shallow groundwater is unlikely a potential future source of drinking water (Ecology letter dated August 10, 1998).

Several cleanup actions have been completed or are on-going at the site. Subsurface product piping traversing the North and South Yards was cleaned and capped in 1992. Separate phase hydrocarbons (SPHs) have been removed through bailing (skimming) from on-site wells over the past few years. Recent groundwater well monitoring indicates that no measurable SPHs are currently present.

The proposed CAP includes two phases of soil and groundwater remediation. Phase I addresses demolition of the aboveground storage tanks (ASTs), removal of the aboveground piping and

associated structures, and remediation of the shallow soil containing metals from AST sand blasting and painting activities (AGI, Interim Action Plan, April 1998). During Phase I, shallow soil will be excavated and disposed of at an approved landfill or recycled where practical. The ASTs and associated piping and structures will be removed and disposed of off-site or recycled where practical.

Phase II proposes methods to increase bioremediation. Phase II will use hydrogen peroxide injection and monitoring to enhance bioremediation of soil and groundwater containing petroleum hydrocarbons. It also includes contingency measures such as continued groundwater monitoring. Future groundwater use, institutional controls, and/or restrictive covenants to restrict disturbance to site soil will require Ecology approval prior to excavation or disturbance of site soil. The cleanup actions will also include ancillary soil sampling, analyses, and remediation to address petroleum hydrocarbon constituents in soil.

Cleanup levels for the chemicals of concern (COCs) in soil and groundwater were developed based upon estimates of the highest beneficial use and the reasonable maximum exposure expected to occur under both current and potential future site use conditions. The COCs are listed in Table 1.

A risk evaluation was conducted to assess risks to human health and the environment. The results of the risk evaluation indicated that the site poses minimal risk from groundwater to surface water when statistical averaging and chemical migration from groundwater and surface water are considered. The risk evaluation also indicated that surface soil concentrations (metals) in the tank farm area are at levels which could pose a threat to worker health should contact occur.

Soil cleanup levels for total petroleum hydrocarbons (TPH) were derived in the Cleanup Development Level Report (Foster Wheeler Environmental, 1998a) using Ecology's Interim TPH Policy. Method C Industrial Soil Cleanup Levels are used for benzene and carcinogenic polynuclear aromatic hydrocarbons (PAHs) (MTCA, Cleanup Levels and Risk Calculations [CLARC II], February 1996). For metals, Method A Industrial Soil Cleanup Levels are proposed.

The shallow groundwater beneath the site has an extremely low probability for use as a drinking water source, but likely discharges to Lake Union. Therefore, Method B surface water cleanup levels are proposed as groundwater cleanup levels for this site. The proposed soil and groundwater cleanup levels are provided in Table 2.

Remedial alternatives were developed for the site by combining remedial technologies and their respective process options. Prior to developing specific cleanup alternatives, the site was separated into two operable units with differing cleanup requirements. The first operable unit is the Tank Farm soil and includes the surface soil containing elevated metal concentrations within the tank farm containment area. The second operable unit is the Lower Areas soil and groundwater and includes the soil and groundwater in the lower half of the North Yard, the South Yard, and the property between the two yards, containing elevated concentrations of petroleum hydrocarbons.

After investigation and evaluation, discussions with Ecology, and considering the findings of the RI/FS, the proposed cleanup for the Tank Farm soil operable unit includes removal of the ASTs, the excavation of shallow soil near these ASTs, and surface water controls or capping.

Additional sampling is proposed for limited areas in both operable units where shallow soil was found to contain petroleum or petroleum constituents exceeding proposed cleanup levels.

The proposed groundwater cleanup actions for the Lower Areas soil and groundwater operable unit consists of hydrogen peroxide injection and monitoring with contingencies if necessary.

Additional soil sampling is also proposed for limited areas of both operable units where shallow soil was found to contain petroleum or petroleum constituents exceeding proposed soil cleanup levels.

Institutional controls include restrictive covenants on use of the site: 1) only for industrial purposes; 2) on extraction or use of groundwater beneath the site; and 3) on excavation activities. Engineering controls proposed include maintenance of existing fencing and containment wall to restrict site access and possible paving of the tank farm area with asphalt. Compliance, protection, and confirmation monitoring will be conducted during and following implementation of the proposed cleanup action in accordance with MTCA.

The proposed cleanup actions will eliminate potential human exposure to hazardous substances from contaminated soil, eliminate the potential groundwater to surface water exposure pathway, and protect human health and aquatic organisms. Removal and treatment alternatives will be implementable in a very short time. The estimated time period for site cleanup is three to five years. Considering the length of time COCs were believed to have been first released at the site (pre-1970s), this is considered a reasonable restoration time frame for this site.

The final CAP will be incorporated into the Consent Decree filed in January 1999 after receiving public comments and Ecology's revisions based on those comments. The design and implementation schedule will begin in January 1999. Tank Farm demolition and shallow soil remediation for metals will be completed in summer 1999. Lower Areas soil and groundwater remediation for petroleum hydrocarbons will be completed in fall 1999/2000. Compliance Monitoring is estimated to be performed from 2000 to 2004.
