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STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

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January 17, 2012

Mr. Aaron Dye
Lopez Village Market, Inc.
PO Box 99
Lopez, WA 98261

Re: Further Action at the following Site:

- **Site Name:** Lopez Village Market
- **Site Address:** 214 Lopez Road, Lopez Island
- **Facility/Site No.:** 87787992
- **VCP Project No.:** NW 2372

Dear Mr. Dye:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Lopez Village Market facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70.105D RCW.

Issue Presented and Opinion

Is further remedial action necessary to clean up contamination at the Site?

YES. Ecology has determined that further remedial action is necessary to clean up contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, Chapter 70.105D RCW, and its implementing regulations, Chapter 173-340 WAC (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:



- Gasoline-range total petroleum hydrocarbons (TPHg); and benzene, ethylbenzene, toluene, and xylenes (BETX) into the Soil.
- TPHg,; BETX; 1,2 dichloroethane (DCA); and naphthalene into the Ground Water.

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology.

Please note that a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. September 23, 2011. *Remedial Investigation, Lopez Village Market, 214 Lopez Road, Lopez Island, Washington*, report by Whatcom Environmental.
2. February 1, 2011. *Initial Investigation Field Report*. report by Washington State Department of Ecology.
3. September 7, 2010, *Re: Underground Storage Tank Site Assessment at Closure – Former Lopez Village Market, 214 Lopez Road, Lopez Island, Washington*. Letter report by Whatcom Environmental.

Those documents are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. You can make an appointment by calling the NWRO resource contact, Sally Perkins, at 425 649-7190.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

Ecology has determined your characterization of the Site is not sufficient to establish cleanup standards and select a cleanup action. The Site is described above and in **Enclosure A.**

Further investigation is required at the Site in order to establish cleanup standards and select a cleanup action as follows:

- Surface water drainage and the presence of subsurface utilities have not been described at the Property or in the surrounding area.
- The lateral extent of TPHg and BETX contamination in soil has not been determined within or outside the Property boundaries, and it has not been confirmed whether contaminated soils extend beneath the former market building. This needs to be accomplished.
- The vertical extent of TPHg concentrations in soil exceeding Method A cleanup levels appears to have been largely defined – basically within the upper 10 feet of soil. The vertical extent of benzene exceedances has not. A number of the deepest soil samples at the Site, ranging between 13 and 29 feet below ground surface, show benzene concentrations greater than the Method A cleanup level.
- Shallow ground water flow directions have not been established. Shallow ground water flow should be to the south or southwest towards the San Juan Channel, whereas the existing monitoring network shows flow to the east. Ecology believes it likely that subtle differences in ground water flow through the clayey silt and underlying sandy silt make well screen placement particularly critical. With well MW-1 screened more deeply than the other wells, the data from this well may not be correlative with that from the other wells. The MW-2 screen is also slightly different from the other two. More consistent screened intervals could provide a more correct indication of uppermost ground water flow across the Site.
- The extent of ground water contamination has also not been determined, nor has an evaluation been made of the potential for short-circuiting flow through utilities, or discharging into local drainage features, or discharging into the San Juan Channel.

2. Establishment of cleanup standards.

a. Soil Cleanup levels.

The Site is located in a low-density commercial area. Soil cleanup levels for unrestricted use protective of direct human contact are therefore required at the Site. Either MTCA Method A or Method B cleanup levels could be used for this purpose, and both were evaluated. Samples run for Method B determination showed TPHg cleanup levels consistently less than the corresponding Method A cleanup level. Method A was therefore chosen for this exposure pathway.

Soil cleanup levels are also needed for protection of ground water. Method A or Method B cleanup levels could be used, and Method A was chosen. Ecology concurs with that choice.

Part of the former Village Market building may be situated over the area of soil contamination. The potential for vapor intrusion therefore exists, and a soil cleanup level protective of indoor air must be considered. Although MTCA does not provide a usable method for establishing such a cleanup level, Method A soil cleanup levels are generally considered protective of air and can be used for that purpose, unless confirmation air monitoring performed during cleanup activities shows an exceedance of air quality standards.

The Site is also located in an area with interspersed tracts of cleared land and vegetation suitable for terrestrial wildlife. A simplified terrestrial ecological evaluation was completed for the Site, and it showed that soil cleanup levels protective of terrestrial species would also be necessary. The values in MTCA Table 749-2 were selected for this purpose. Ecology concurs with this choice for this exposure pathway.

Final soil cleanup levels for this Site are the Method A values.

b. Soil Point of Compliance.

The point of compliance for soil at this Site is throughout the Site.

c. Ground Water Cleanup Levels.

The highest beneficial use for ground water beneath the Property is presumed under MTCA to be as a potable source. Cleanup levels protective of this use will

be based on Method A, Method B, or applicable state and federal laws (e.g., Federal MCLs), and have yet to be established.

d. Ground Water Point of Compliance.

The point of compliance for ground water is throughout the Site.

e. Air Cleanup Levels.

Air cleanup levels must be established for protection of ambient air at the Site, including air inside buildings. Only Method B is available for this purpose. The air cleanup levels have yet to be established.

f. Air Point of Compliance.

The standard point of compliance is ambient air throughout the Site, and in structures within the Site large enough for a person to fit into.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70.105D.080 and WAC 173-340-545.

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3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70.105D.030(1)(i).

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our website: www.ecy.wa.gov/programs/tcp/vcp/vcpmain.htm. If you have any questions about this opinion, please contact me at 425 649-7107.

Sincerely,



Mark Adams
Toxics Cleanup Program

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Enclosures (1): A – Description of the Site

ecc: Harold Cashman, Whatcom Environmental

Enclosure A

Description and Diagram of the Site

Site Description

This section summarizes Ecology's understanding and interpretation of site conditions, and forms the basis for the opinions expressed in the body of the letter.

Site: The Site comprises a gasoline release to soil at the property located at 214 Lopez Road on Lopez Island (the Property). The Property and the Site are shown on the attached Site Map.

Area Description: The Property is within the only commercial center on the island. The commercial area is low density, with undeveloped lots interspersed between buildings and shops. The surrounding area is rural. Development includes restaurants, retail businesses, senior housing, and community facilities.

Property History and Current Use: Nothing is known about the history of the Property to Ecology, except that it formerly contained the Village Market. The market building is currently vacant. A 2,000 gallon underground storage tank (UST) and 4,000-gallon UST and a fuel dispenser were formerly present at the Property. The tanks stored gasoline and were removed in 2010. The dispenser was presumably removed at the same time.

Sources of Contamination: Spills and leaks associated with the two tanks, fuel dispenser, and product lines are the only known sources of contamination at the Property.

Physiographic Setting: The Site and surrounding area is located on the west side of Lopez Island, near where Fisherman Bay meets the San Juan Channel. The Property is only a few hundred feet from the shoreline at about 22 feet above sea level. The land surface in the area slopes gently down to the southwest towards the bay. The junction between sea and land is fairly low relief in the area, except for a steeper section of shoreline bluff immediately west of the Property.

Surface/Storm Water System: Surface water conditions at the Site and in the surrounding area have not been described in the RI.

Ecological Setting: There is abundant terrestrial habitat in the area, associated with undeveloped yards between buildings, local parks, the surrounding rural countryside, and marshy areas to the south.

Geology: Geologic conditions across the island are thought to consist of a thin veneer of glacial sediment over volcanic and sedimentary bedrock. Conditions at the Site itself have been explored to a depth of about 40 feet. These explorations have shown an upper 30-foot thick deposit of stiff clayey silt or silty clay, underlain by fine sandy silt. The deposits are part of the glacial Bellingham Glaciomarine Drift. A nearby water supply well drilled to a slightly greater depth (65 feet) showed fine-grained deposits similar to those at the Site extending to 57 feet below ground surface and underlain by sandy gravel.

Ground Water: The fine-grained glaciomarine deposits underlying the Site have a low permeability and would generally be considered an aquitard. Almost no evidence for significant water-bearing zones was observed in borings drilled at the Site. However, the glaciomarine deposits do yield ground water to open bores and monitoring wells, indicating that one or more zones of higher permeability do exist within the silts and clays. Of the two glaciomarine deposits identified at the Site (upper clayey silt and underlying sandy silt), the sandy silt has greater permeability and appears to have lower potentiometric heads. Both, however, appear to be semi-confined, with static depths to water in the monitoring wells ranging between 5 and 15 feet below land surface.

Ground water also occurs at and near the land surface perched on top of the clayey silt within fills and in looser weathered topsoils, and is present at depth in the sandy gravel deposit. Ground water in the sandy gravel, if present beneath the Property, should comprise the first major aquifer. Ground water in this aquifer is confined, with the potentiometric head 35 feet higher than the top of the aquifer (depth to water is about 20 feet below ground surface).

Lateral ground water flow directions at the Site are expected to be somewhat variable, but should be generally down slope to the south and southwest. The uppermost perched ground water flow should directly mimic topography and discharge into local drainage ditches. The ground water flow in the clayey silts/sandy silts and sandy gravel may also mimic topography, but should also be influenced by the nearest point of discharge, either the salt marshes ringing Fisherman Bay or San Juan Channel. Actual data from the three monitoring wells installed at the Site implies flow to the east. Unless there is a local subsurface utility causing this perturbation, the implied flow direction is unlikely to be correct. Ecology believes it likely that subtle differences in ground water flow through the clayey silt and underlying sandy silt make well placement particularly critical, and the data from the existing wells may not be correlative because each is screened at a slightly different depth.

Subtle vertical flow also appears to be occurring at the Site, with ground water in the clayey silts moving downward into the sandy silts. Confined conditions in the underlying sandy gravel should impede, but do not preclude, further downward flow from the sandy silts into the sandy gravel.

Water Supply: Numerous water supply wells are likely present in the general area in addition to the nearby 65-foot well referenced above.

Release and Extent of Contamination - Soil: Soil at the Property has been impacted by gasoline releases at the two the UST locations, the dispenser location, and the underground fuel line connecting the two UST locations. The maximum detected concentrations were 1,300 mg/kg TPHg and 19 mg/kg benzene at the same location adjacent to the fuel line (B-1 at 9 feet). Ethylbenzene and xylenes were also detected at their highest concentrations at this location.

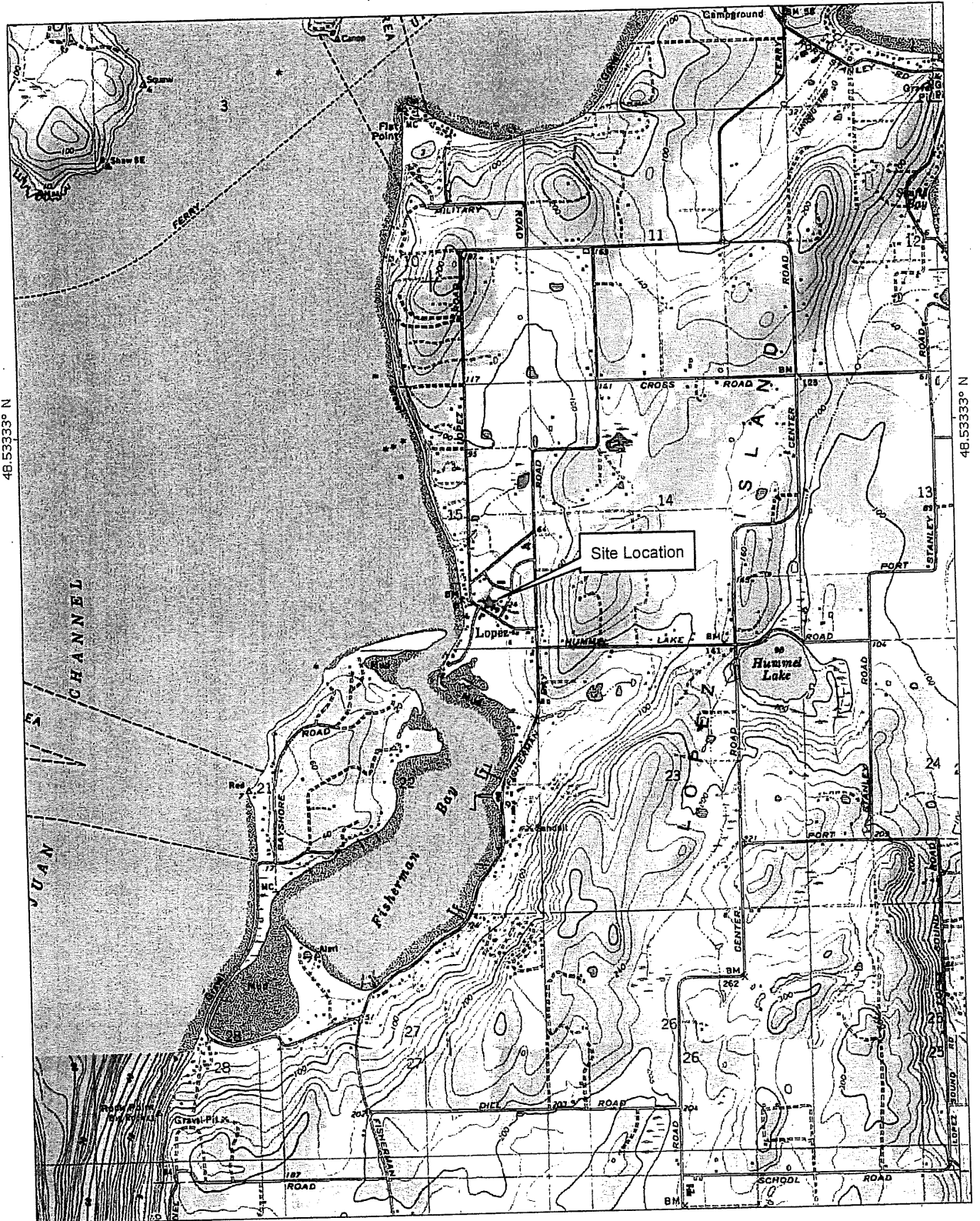
The gasoline releases occurred at shallow depths near the surface and within tank backfill, all underlain by low permeability native sediment. Despite this, the contamination spread laterally over a wide area and to a considerable depth. Ecology believes it likely that contaminant dispersal occurred predominantly through capillary diffusion (or "wicking") through the fine-

grained soils, as opposed to direct flow or transport in ground water. The full lateral extent of the Site has not been determined, but appears to be focused near the fuel line and the western tank. This portion of the Site consists of a contaminated area measuring at least 80 by 100 feet. A smaller contaminated area associated with the eastern tank and fuel dispenser measured about 20 by 25 feet in plan dimension.

The vertical extent of contamination has also not been determined, especially for benzene. While both TPHg and benzene concentrations tend to drop off below a depth of 10 or 11 feet, the benzene concentrations remain elevated above MTCA Method A cleanup levels in some of the deepest samples collected at the Site. The deepest sample collected to date (29 feet bgs in B-1) had 2.4 mg/kg benzene, as compared to the MTCA Method A cleanup level of 0.03 mg/kg for this compound. The soil log for B-1 shows detectable organic vapors from the samples at 29 feet and 34 feet, but no detectable vapor at 37.5- 39 feet. It could be the base of contamination occurs somewhere in the 34 to 37-foot depth interval.

Extent of Contamination – Ground Water: Three monitoring wells exist at the Site and have been sampled. The two wells located near the fuel line and in the westernmost portion of the Property (MW-1, MW-3) show gasoline impact. The well located in the eastern portion of the Property (MW-2) shows no impact. This data is consistent with the distribution of soil contamination and the anticipated direction of ground water flow, but not the actual flow data as described above.

The maximum concentrations of TPHg and benzene detected were 3,800 ug/L and 10,000 ug/l respectively. Toluene, ethylbenzene, and xylenes were also detected along with unusually elevated 1,2-dichloroethane (EDC). The maximum EDC concentration detected was 390 ug/l, compared to the Method A cleanup level of 5.0 ug/l. The lateral and vertical extent of ground water contamination has not been determined, but is likely to be confined to the clayey silt and sandy silt deposits.



48.53333° N

48.53333° N

TN* / MN
18°

0 1000 FEET 0 500 1000 METERS 1 MILE

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Prepared for:

Lopez Village Market

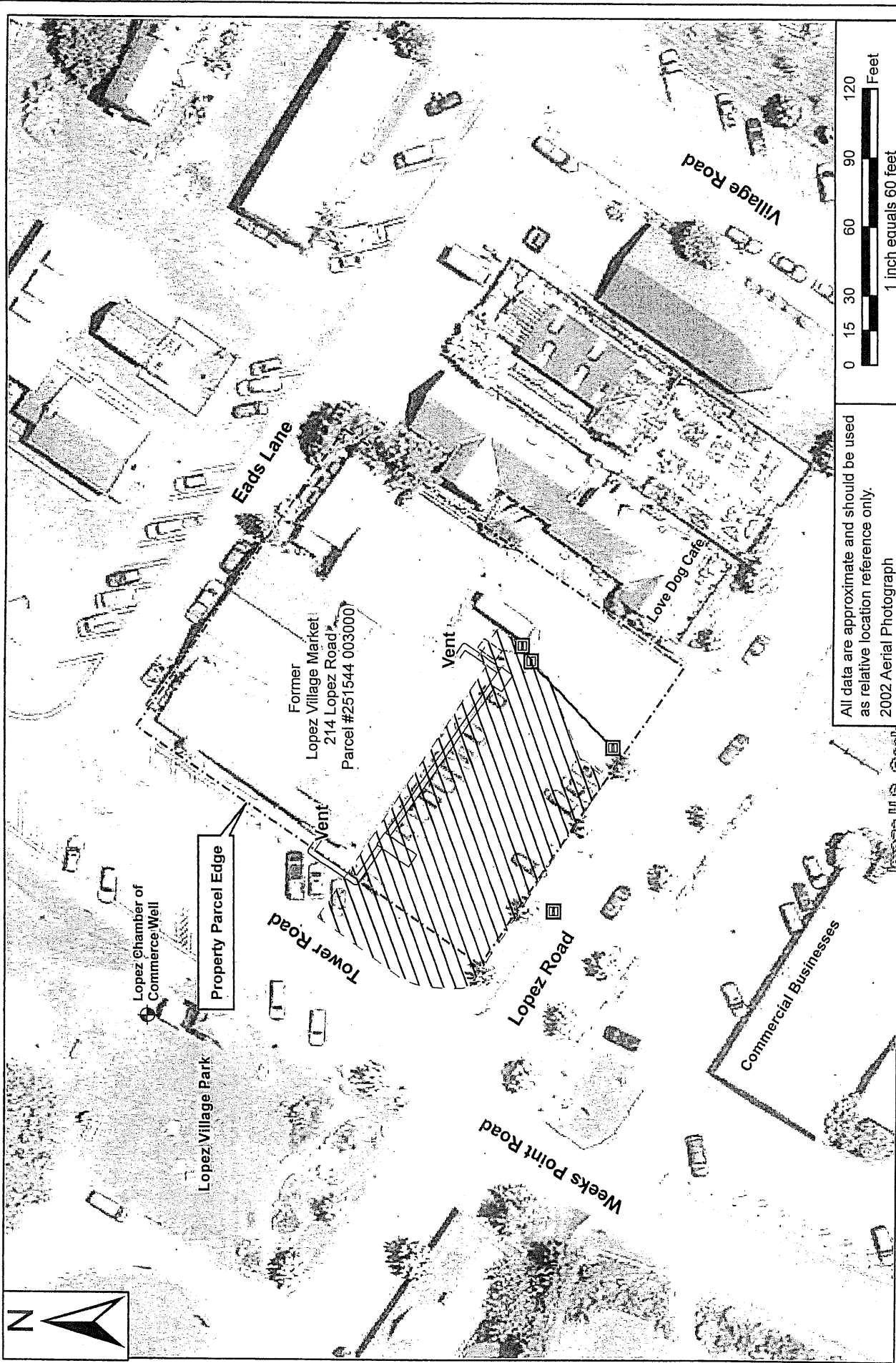
Prepared by:

nwhatcom
ENVIRONMENTAL

Site Location Map

Lopez Village Market UST
8/26/10

Figure 1



All data are approximate and should be used as relative location reference only.
 2002 Aerial Photograph

Prepared by:
Whatcom
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Lopez Village Market

Site Overview Map
 Lopez Village Market
 1/7/09

Figure 2

- Estimated Site
- Lopez Market Tanks
- Tank (Removed)
- Dispenser (Removed)
- Catch Basins
- Storm Lines
- Tank Piping