PERIODIC REVIEW

Aluminum Recycling Corporation
Spokane, WA

February 2008
Washington Department of Ecology
Toxics Cleanup Program
Eastern Regional Office
Spokane, WA

1.0 INTRODUCTION

This report presents the Washington State Department of Ecology's (Ecology) periodic review for the Aluminum Recycling Corporation Site (Site). This periodic review is required as part of the site cleanup process under the Model Toxics Control Act (MTCA), Ch. 70.105D RCW, implemented by Ecology. Periodic reviews evaluate post-cleanup site conditions and monitoring data to assure that human health and the environment are being protected. They are required for sites where an institutional control is part of the cleanup action.

Cleanup actions were conducted at the Site by the Burlington Northern Santa Fe Railroad Corporation (BNSF) in 2003. These actions addressed contaminated soils, but residual groundwater contamination remained. Groundwater monitoring has been ongoing since completion of the cleanup action.

2.0 SUMMARY OF SITE CONDITIONS

2.1 Site Description and History

The eight-acre site, located at 3412 E. Wellesley Avenue, Spokane, Washington, was initially used as a gravel pit for an asphalt plant (Figure 1). Beginning in 1954, site use changed to an aluminum reprocessing facility using scrap aluminum and aluminum dross. Several lessees continued these operations until 1987, when the property was abandoned by all lessees with an estimated 65,000 cubic yards of dross material remaining on-site. BNSF still retained ownership of the property throughout that timeframe.

The facility processed white dross, which was composed of aluminum skim and other materials derived from primary smelting operations. White dross, which contains various oxides, aluminum metal, carbides, and nitrides was treated through the addition of salts, cryolite, and heat to separate out molten aluminum metal. The resulting residue after the secondary treatment was high-salt black dross. This material, along with a small volume of semi-processed white dross, was deposited on-site in various waste piles and in the former gravel pit. Approximately 65,000 cubic yards of dross remained on-site. When wet, the black dross generates ammonia odors and heat, which had caused complaints and one fire. Temporary surface stabilization measures had been taken to limit these reactions.

2.2 Site Investigations and Cleanup

In 1985, the Department of Ecology completed a Preliminary Assessment (PA) of the property, and recommended that dust and fumes be controlled, the dross materials be appropriately disposed of, and local water supply wells be sampled to ensure they hadn't been contaminated. Ecology then conducted a PA/Site Inspection (SI) Phase I in 1987. It concluded that the Site was potentially contaminated with hazardous substances. No dangerous waste designation was completed at that time.

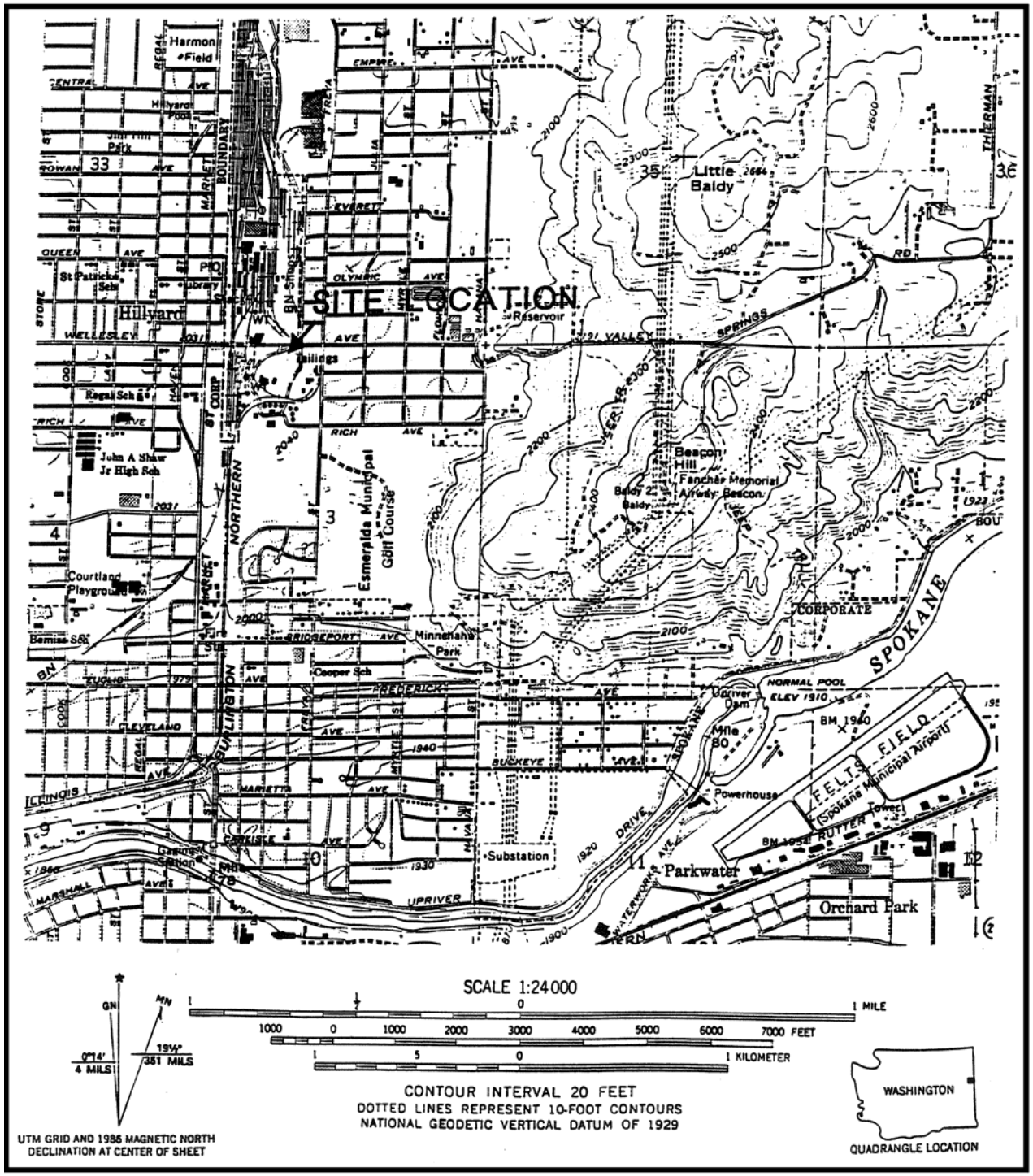

Figure 1. Site Map

In 1988, BNSF performed a Site characterization study, during which groundwater, soil, and deeper dross samples were collected and surface stabilization and site access restrictions occurred.

In 1989, a dross characterization study was done for BNSF which showed that about 95% of the dross on-site could be considered a dangerous waste under Washington State regulations due to high concentrations of chloride, fluoride, and nitrate. Also, groundwater under the dross piles contained chloride, fluoride, and nitrate at levels exceeding state drinking water standards.

In 1991, Ecology completed a Site ranking using the Washington Ranking Method (WARM); the Site received a rank of 2 on a scale of 1 to 5, with 1 representing the greatest threat to human health and the environment. In 1996, BNSF's consultant reviewed the previous work and provided information on the physical and chemical properties of the dross, indicating that it was not a dangerous waste according to bioassay testing. It also indicated the remaining salts were encapsulated and unable to be leached. Site access restrictions were also established.

BNSF and Ecology signed an Agreed Order in November 1998 to complete a Remedial Investigation/Feasibility Study (RI/FS) which was finalized one year later. Results indicated that groundwater was contaminated with chloride, fluoride, nitrate, and nitrite, and that soil was contaminated where mixed with dross.

A Cleanup Action Plan (CAP) was prepared in 2000 which summarized investigations and contamination at the site and selected the remedy. The remedy, implemented in 2001, involved excavation and consolidation of dross and soil mixed with dross into an on-site pit, capping of the consolidation area with a low permeability multimedia cover system, and routing of surface water drainage into an on-site lined evaporation pond. Fencing, signs, and deed restrictions are maintained for the property. Four existing monitoring wells, installed prior to the RI/FS, are also sampled on a quarterly basis for chloride, fluoride, nitrate, and nitrite.

3.0 PERIODIC REVIEW

3.1 Regulation

Under WAC 173-340-420, a periodic review of the cleanup action takes place at least every five years after the initiation of the cleanup action. A periodic review is required at sites where any of the following occur:

- The department conducts a cleanup action.
- The department approves a cleanup action under an order, agreed order, or consent decree.
- As resources permit, whenever the department issues a no further action opinion.

AND one of the following conditions exists:

- An institutional control and/or financial assurance is required as part of the cleanup action.
- Cleanup level is based on a practical quantitation limit as provided for in WAC 173-340-707.
- Modifications to the default equations or assumptions using site-specific information would significantly increase the concentration of hazardous substances remaining at the site after

cleanup or the uncertainty in the ecological evaluation or the reliability of the cleanup action is such that additional review is necessary to assure long-term protection of human health and the environment. Because the cleanup action was performed under a consent decree and institutional controls are required, the site is subject to periodic reviews at a frequency of no less than every five years.

3.2 Basis

This review is based on documents describing the actions listed in Section 2.2. These include periodic groundwater compliance monitoring reports submitted quarterly from 2003 through 2007.

3.3 The effectiveness of ongoing or completed cleanup actions including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the site

An engineered cover system was placed over the dross materials remaining on the site. This low-permeability cover was designed to minimize the infiltration of surface water and route it away from the emplaced waste. Although grasses were planted on the cover surface, they did not grow successfully. Despite that, surface erosion appears to be minimal. The lined evaporation pond, installed to capture surface runoff, functions well, and it can handle high flow events without overflow. The cover system and evaporation pond are visually inspected on a monthly basis to ensure there is no significant deterioration.

Institutional controls at the site include access restrictions and a restrictive covenant. Fencing and signs are checked and maintained on a monthly basis along with the cover and pond. The restrictive covenant, which limits the use of the site, was recorded and is in place. These limitations include maintenance of fences and signs, industrial use only, limitations on groundwater withdrawal and use, and restrictions on activities which would interfere with the performance of the remedy. These institutional controls have proven effective in reducing exposure and protecting the integrity of the remedy.

Groundwater contaminant concentrations have been monitored quarterly since June 1997 at four site monitoring wells (Figure 2). Monitoring wells MW-4 and MW-6 (upgradient and furthest downgradient) show no cleanup level exceedances for any constituents since completion of the cleanup action (Figures 3, 4, & 5). MW-3 shows statistically significant decreasing trends for both chloride and nitrate, using the Mann-Kendall statistical test. Fluoride shows increasing trends, but most detections are at or below cleanup levels. MW-5 is in an area of historical dross piles which extended to various depths. It is also closest to emplaced waste material. Thus, it shows the most impact and will likely take the longest to show improvements. At this well, chloride, fluoride, and nitrate concentrations all show statistically significant increasing trends, and chloride and nitrate regularly exceed cleanup levels. Nitrite has not exceeded cleanup levels at any of the wells. Overall, contaminant concentrations are showing the trends expected for a five-year time frame.

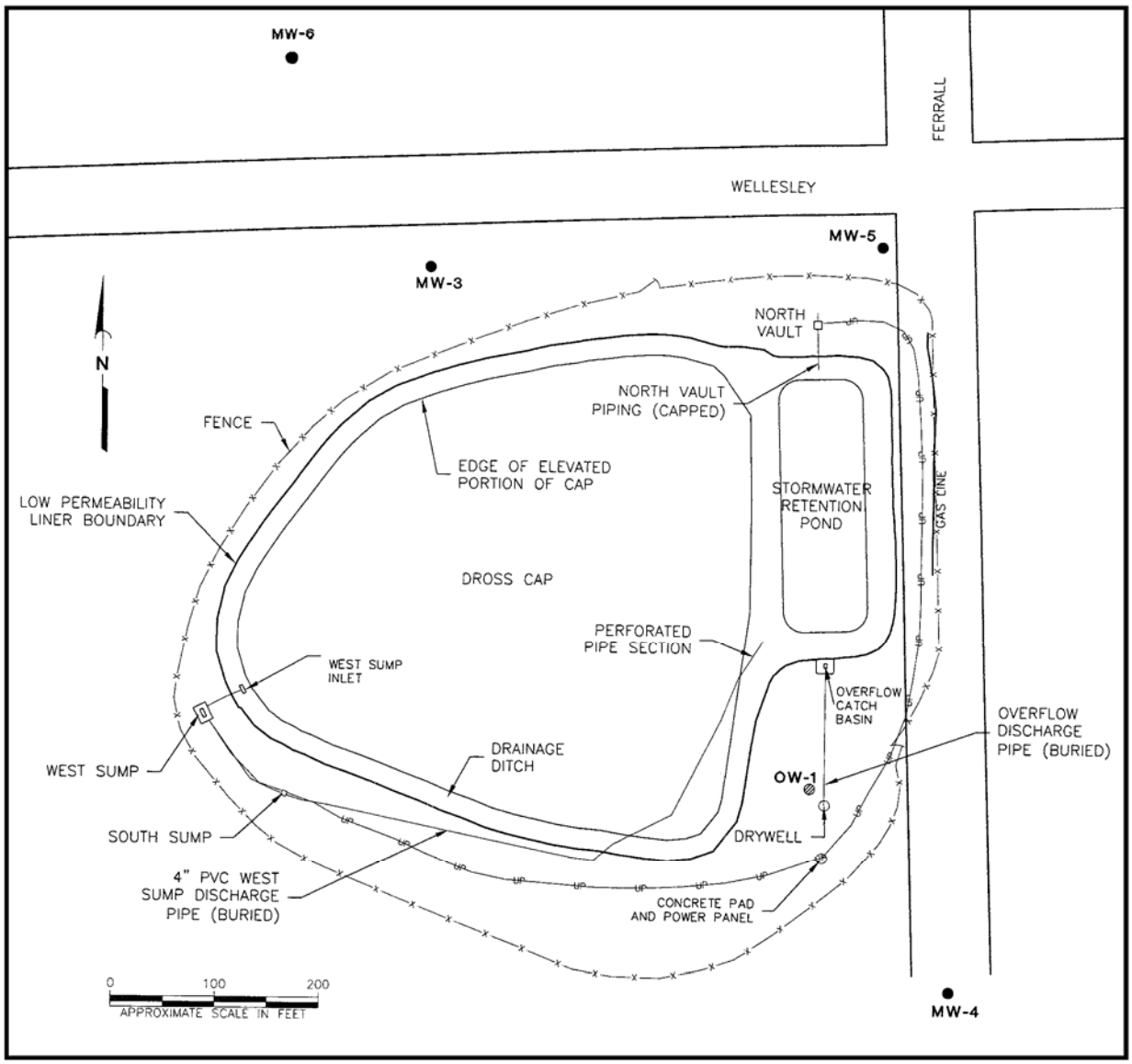

Figure 2. Well Locations and Final Site Configuration

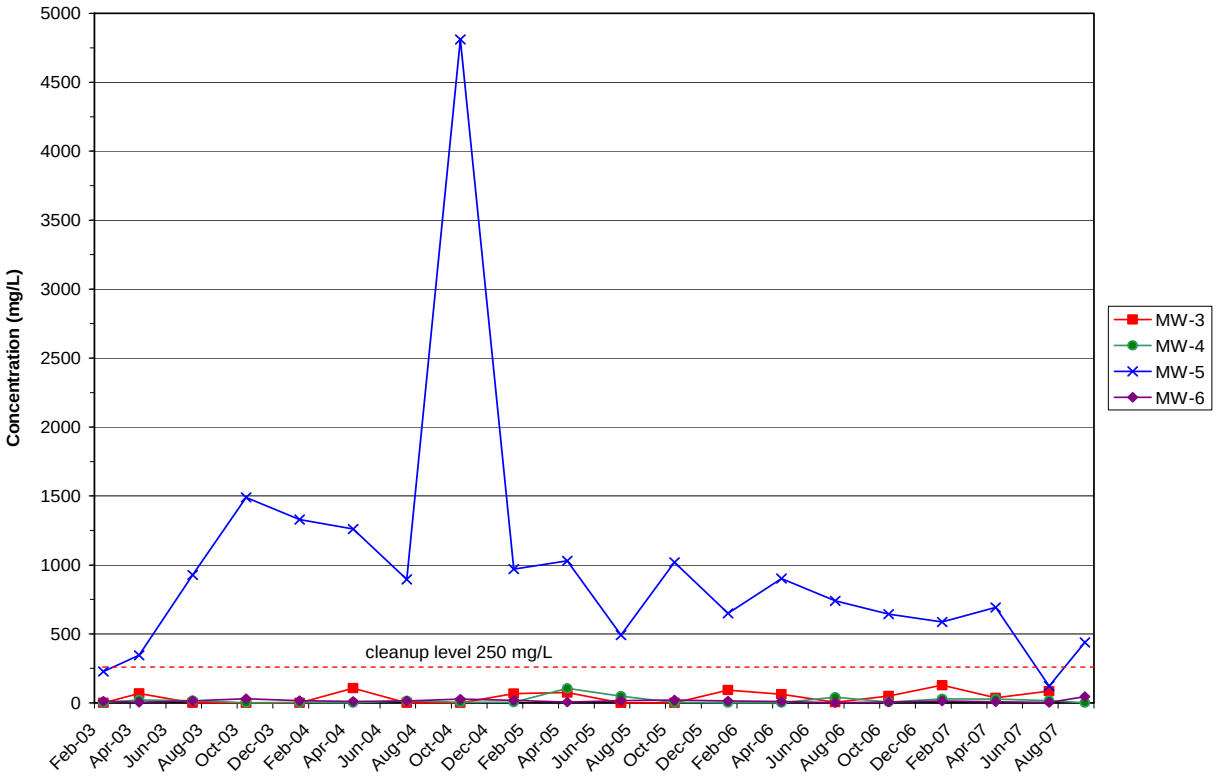

Figure 3. Chloride Concentrations

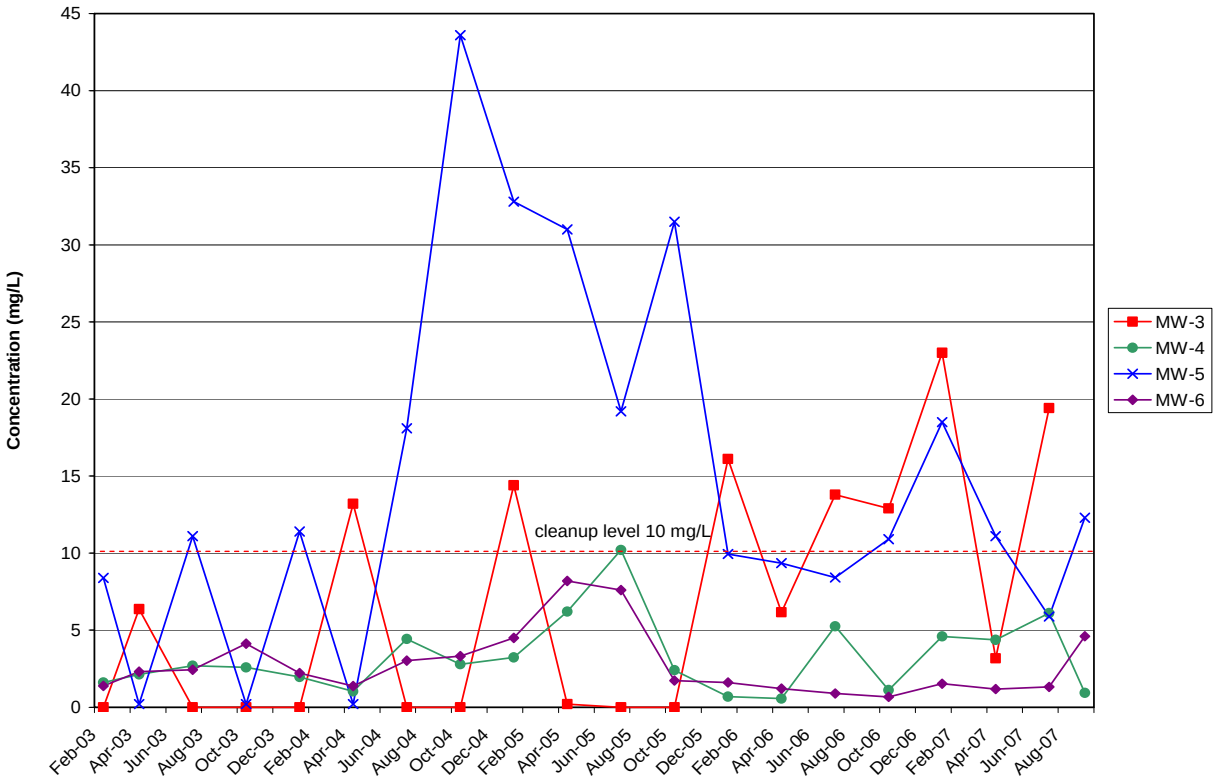

Figure 4. Nitrate Concentrations

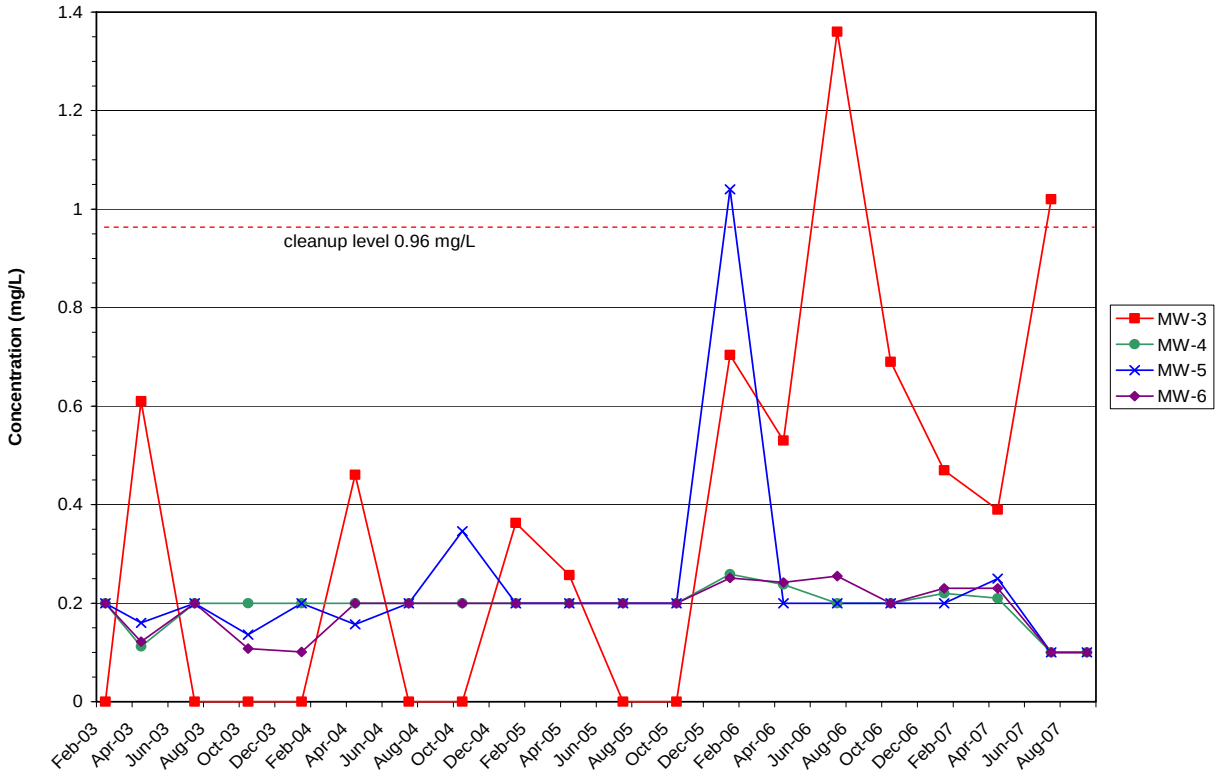

Figure 5. Fluoride Concentrations

3.4 New scientific information for individual hazardous substances or mixtures present at the Site

No new scientific information is available for chloride, nitrate, nitrite, or fluoride.

3.5 New applicable state and federal laws for hazardous substances present at the Site

MTCA has been updated since the CAP was written. Under the 2007 revised MTCA regulation, secondary maximum contaminant levels (SMCLs) are no longer regulated as federal applicable, relevant, and appropriate requirements (ARARs) under the Safe Drinking Water Act. However, SMCLs are still considered an ARAR under the State Department of Health's regulations for public water supplies. Therefore, chloride is still regulated as a SMCL. No new federal or state laws would affect the other contaminants at the site.

3.6 Current and projected Site and resource uses

The site is currently vacant. Trespassing is discouraged by the presence of a chain-link fence at the site perimeter. Regular site inspections indicate that the fencing does keep trespassers off the site.

When the CAP was originally written, it was anticipated that a freeway would be built very near the site. Accommodations were made during the design for rerouting train tracks and other issues specific to the freeway corridor. At this point, definitive plans have not been established for the freeway. It is expected that no site use changes will occur in the next five years.

3.7 The availability and practicability of more permanent remedies

A "permanent" cleanup action is defined in MTCA as a cleanup action in which cleanup standards can be met without further action being required. Several remedial alternatives were evaluated in the CAP. Of these, the only remedy evaluated that would be more permanent would be removal and off-site disposal. No new technologies have been developed since the CAP that would be more permanent.

3.8 The availability of improved analytical techniques to evaluate compliance with cleanup levels

No improved analytical techniques are available.

4.0 CONCLUSIONS

Ecology has determined that the remedy at the Aluminum Recycling Corporation Site is generally protective of human health and the environment. The measures that were taken for the original cleanup action remain protective today. Continued inspections ensure that the cap remains functioning, and compliance monitoring allows for groundwater impacts and trends to be measured. The existence of institutional controls in the form of deed restrictions confirms that site uses will remain consistent with the presence of contamination. Further periodic reviews will be required as long as institutional controls are in place at the site, in accordance with WAC 173-340-420(7).

5.0 REFERENCES CITED

Washington State Department of Ecology, 2001, Model Toxics Cleanup Act Regulation Chapter 173-340 WAC