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Skagit County

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mailed  
12/17/09  
PAG

December 17, 2009

Jeff Beltramini  
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P.O. Box 547  
Anacortes, WA 98221

Janet Cray  
ATSI  
21993 Grip Road  
Sedro Woolley, WA 98284

RE: A Avenue Landfill 10-Year Closure Plan City of Anacortes, Washington

Dear Mr. Beltramini and Ms. Cray:

I have reviewed your December 12, 2009 report "A Avenue Landfill 10-Year Closure Plan City of Anacortes, Washington." The plan is approved by the Skagit County Health Department. We will look for the submittal of the As Built and Drainage Inspection as described in the 10-Year Closure in the next few weeks. Sampling locations will be determined at that time with sampling reports to be submitted in 2010 and 2015. Please be aware that if conditions change at the site or new information is found indicating a threat to human health or the environment the Health Department may require changes to this plan and further review of the site under the Model Toxics Control Act. Any changes to this plan need to be reviewed and approved in writing by the Health Department. Thank you all for your efforts in completing the closure of this landfill.

Sincerely,

*Polly Dubbel*  
Polly Dubbel  
Environmental Health Specialist

**A AVENUE LANDFILL  
10-YEAR CLOSURE PLAN  
CITY OF ANACORTES, WASHINGTON**

**12 December 2009**

*Prepared for:*

**City of Anacortes  
904 – 6<sup>th</sup> Street  
P.O. Box 547  
Anacortes, WA 98221**

*Prepared by:*

**ATSI  
21993 Grip Road  
Sedro-Woolley, Washington 98284**



**ATSI**

Aqua-Terr Systems, Inc.

**RECEIVED**

**DEC 16 2009**

**SKAGIT COUNTY  
PUBLIC HEALTH DEPT.**

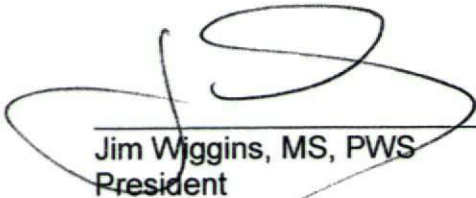
**A AVENUE LANDFILL  
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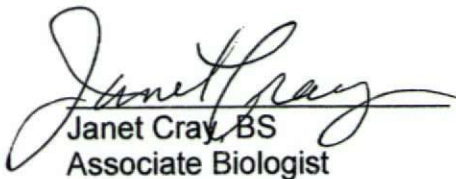
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*Prepared by:*



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## **EXECUTIVE SUMMARY**

In August 2009, the City of Anacortes contracted with ATSI to prepare a 10-Year Closure Plan for the A Avenue Landfill. The Closure Plan is intended to meet the requirements set forth by the Skagit County Health Department (Skagit County) by addressing: the topography and final recontouring of the landfill cap in order to increase surface water run off and decrease the potential for infiltration; drainage inspections and test sampling; public safety issues created by landfill debris in the uplands and wetlands; annual maintenance, adaptive management, and follow up reports.

## **INTRODUCTION**

As requested, ATSI reviewed the approximately 6-acre landfill located within a portion of the Anacortes Community Forest Lands, west of A Avenue, in the City of Anacortes, Washington, within a portion of Section 26, Township 35 North, Range 1 East, W.M. (Figure 1). The landfill is comprised of the "cap," which is approximately 1.58-acres of bare weedy surface soils rising 25 to 30 feet above grade; approximately 1.95-acres of steep vegetated slopes adjacent to the cap; and the remaining areas of debris which extend in all directions into the adjacent forested wetland and upland areas (Figures 2 and 3).

ATSI met with Skagit County staff who clarified that the A Avenue Landfill closed under WAC 173-301 standards. Therefore, the current WAC 173-351 landfill closure standards do not apply to the landfill. However, the Health Department recommended capping, maintenance, monitoring, and public safety/access specifications to mitigate environmental and public health impacts from the landfill. This 10-year Closure Plan will address how the City will meet these criteria.

## **SITE DESCRIPTION**

### **General**

The landfill is located within a portion of the Anacortes Community Forest Lands (ACFL), west of A Avenue, in the City of Anacortes, Washington (Figure 1). The landfill is approximately 6-acres in size and is comprised of the "cap," which is approximately 1.58-acres of bare weedy surface soils that rise 25 to 30 feet above grade; approximately 1.95-acres of steep vegetated slopes adjacent to the cap; and the remaining areas of debris which extend in all directions into the adjacent forested wetland and upland areas (Figures 2 and 3). The cap, though slightly sloped to the east, is terrace-shaped and allows pockets of water to pond and potentially infiltrate into the landfill (Figures 3, 5, 6 and 7). A 6-foot tall chain-link fence was erected and extends along the southeastern side of the landfill, adjacent to the trail, to prohibit access by bicycles and motorcycles onto the cap. A stormwater collection ditch was constructed in 2008 along the southeastern boundary of the landfill.

Land use in the vicinity of the landfill includes approximately 517 acres of the ACFL with trails utilized for walking, hiking, bicycling, and motorcycle riding. Residential areas are located to the east of A Avenue. Because of the heavy public use of the trails in the vicinity of the landfill, public safety issues are a primary concern with



Skagit County, especially adjacent to the glass debris area located along the west side of the landfill.

On 15 February 2006, ATSI performed a Wetland Fish/Wildlife Reconnaissance and Delineation of a study area, approximately 10-acres in size, which included the A Avenue Landfill and immediate vicinity. We identified seven seasonally flooded, palustrine forested scrub/shrub (PFO/SSC) wetlands within and near the 10-acre study area. Wetlands B, C and D are located to the east of the landfill and wetlands E, F and G are located to the west (Figure 3; ATSI 31 May 2006 Report). Wetlands E and F are associated with seasonal streams that originate and/or continue off-site. Wetland A is likely a Category I wetland, but is off-site and was not fully investigated as part of the 31 May 2006 report. Wetlands E and F are rated as Category I wetlands with 200-foot required buffers. Wetlands B, C, D, and G are rated as Category III wetlands with 50-foot required buffers. These wetlands are regulated by the City of Anacortes, state, and federal governments, and permits are required from the appropriate agencies for site development and activities that occur in the wetlands or buffers.

The proposal for the landfill cap will not fill any wetlands; however, placement of fill will occur within the buffers of the on-site regulated wetlands. Because the site of the cap is a landfill, the dominant vegetation is non-native and the margins/steep slopes of the landfill where mowing is impracticable have generated invasive species that include: poison hemlock (*Conium maculatum*), Japanese knotweed (*Polygonum cuspidatum*), and hedge bindweed from the morning glory family (*Convolvulus sepium*). The majority of the cap will be planted with non-native grass for the purpose of preventing tree root penetration through the cap; however, noxious weed control along these margins/steep sides of the landfill has and will continue to be implemented. The net result will be an enhancement of the existing buffers.

### **Historical Information**

During the 1960's and 1970's, the landfill was utilized for municipal solid waste, most of which was eliminated by burning. When regulations changed and burning was prohibited, the City stopped accepting municipal waste at this location, but continued to use it to dispose of and store materials such as wood waste, concrete and asphalt, metals, yardwaste, vector waste, and street sweepings. In the 1980's, a concrete slab was poured to the east of the landfill cap and used for a sewage sludge drying bed. In the early 1990's, it was reported that a plastic barrier was laid down and the surface of the landfill was used to treat petroleum contaminated soils.

In 2003, Skagit County conducted an initial investigation of the A Avenue Landfill. It was determined that no data existed for the type of soils placed in the landfill or the thickness or permeability of the surficial layers of the cap. Without documentation for the soils, type, and thickness of the cap; it was difficult to accurately assess the level of risk generated by the landfill from the potential infiltration of surface water and/or the leaching of potential toxins. In 2003, the City of Anacortes contracted with Geomatrix to test for the presence of any contaminants that were likely to pose risks



which would trigger further action under the Model Toxics Control Act. No results from the water quality tests exceeded applicable MTCA Method A or B clean up levels for groundwater and surface water with the exception of manganese. There was only one type of volatile organic carbon (VOC), p-isopropyl toluene, detected; but there is no clean up level listed for this compound. After reviewing the results of the water quality test samples collected by Geomatrix, the site was placed on the Confirmed and Suspected Contaminated Sites list by Ecology for confirmed soil contamination with petroleum products and suspected soil and sediment contamination with petroleum and polycyclic aromatic hydrocarbons (PAH). There has been no additional testing performed since this time.

In April of 2005, the City contracted with Geomatrix to investigate the site and prepare a work plan for further grading of the landfill. The grading was intended to reduce stormwater infiltration, minimize the potential for leachate, minimize erosion and to address public safety issues. In their August 2006 report, Geomatrix stated that, when the City closed the landfill in approximately 1973, they brought in soils to cover the waste and they regraded the landfill. The report noted that these were standard methods for landfill closures at this time. They confirmed that, following the initial closure, the City used the landfill up to 2006 for disposal and storage of public works materials including wood and yard wastes, concrete and asphalt, scrap metals, street/vector waste materials, street sweepings, and fill dirt. They further stated that these materials averaged 5 to 6 feet in thickness over most of the site, but as much as 15 feet over the southwestern portion of the landfill. Overall, the landfill reaches 25 to 30 feet in elevation above the surrounding topography. Geomatrix noted that, while the landfill generally slopes to the east, two terraces were present. Ultimately the proposal outlined by Geomatrix for the grading and final capping of the landfill was not carried out because it was felt the proposed plan was overly complex and the City wanted to seek a more cost effective solution.

On 15 February 2006, ATSI performed a Wetland Fish/Wildlife Reconnaissance and Delineation of approximately 10-acres which included the A Avenue Landfill and immediate vicinity. We identified seven seasonally flooded, palustrine forested scrub/shrub (PFO/SSC) wetlands within and near the 10-acre study area. Wetlands B, C and D are located to the east of the landfill and wetlands E, F and G are located to the west (Figure 3; ATSI 31 May 2006 Report). Wetlands E and F are associated with seasonal streams that originate and/or continue off-site. Wetland A is likely a Category I wetland, but is off-site and was not fully investigated as part of the 31 May 2006 report. Wetlands E and F are rated as Category I wetlands with 200-foot required buffers. Wetlands B, C, D, and G are rated as Category III wetlands with 50-foot required buffers. These wetlands are regulated by the City of Anacortes, state, and federal governments, and permits are required from the appropriate agencies for site development and activities that occur in the wetlands or buffers.

In the fall of 2008, the City brought in additional soil and graded the east and northeast sides of the cap.



On 7 April 2009, Skagit County conducted a second site assessment of the landfill. It was noted that the surface of the landfill was tiered, that additional soil now covered previously exposed materials, and a 6-foot high chain-link fence was installed to prevent public access to the cap. However, Skagit County also observed water collecting in pockets that could be seen in wet weather. In their 26 May 2009, Site Hazard Assessment report, Skagit County recommended no further action under the Model Toxics Control Act, conditioned on completion of approved landfill closure. The report notes that no drinking water systems are impacted from the landfill and that the areas receiving runoff are native wetlands. Therefore, Skagit County concluded that the risk of environmental impacts to the wetlands from further dredging or additional work was greater than impacts posed to the public since everyone down gradient receives public water.

Skagit County requested that the City proceed with the implementation of a 10-year closure plan (CP) which addressed: safety issues such as limiting public access to the cap and the western glass/metal debris field, removal of materials from the surface of the landfill where removal can be accomplished in a way that does not negatively impact the environment, completion of a soil cap that is recontoured to prevent ponding and reduce stormwater infiltration, maintenance of a grass cover on top of the cap, test sampling for leachate, and a maintenance plan for follow ups needed to assess the effectiveness of the cap and to address any other issues that require further attention.

In 2009, the City contracted with ATSI to prepare a 10-Year CP for the A Avenue Landfill. Jim Wiggins and Janet Cray of ATSI met with Skagit County on 26 May 2009. At this meeting, Skagit County clarified that the A Avenue Landfill closed under WAC 173-301 standards. Therefore, the current WAC 173-351 landfill closure standards do not apply to the landfill. However, the Health Department recommended capping, maintenance, monitoring, and public safety/access specifications to mitigate environmental and public health impacts from the landfill. Subsequent meetings between Skagit County, ATSI, and the City, held on-site at the landfill on 14 October and 19 October of 2009, identified options and further clarified acceptable closure requirements. This 10-Year CP incorporates information gathered from meetings with Skagit County, itemizes the requirements for the CP, and details how each will be addressed by the City of Anacortes in order to provide an acceptable closure plan for the A Avenue Landfill.

#### **PROPOSED 10-YEAR CLOSURE PLAN**

This CP, as outlined below, will address the recommendations for capping needed to increase surface water run off and decrease the potential for infiltration; monitoring through drainage inspections and test sampling; public safety/access; and annual maintenance, adaptive management, and reporting.



## **Landfill Capping**

### *Topography*

The existing topography of the landfill will be modified by the resculpting of existing surface materials and the placement of additional fill in order to create a mounded cap with approximately 5 percent slopes (Figure 4, 5, 6 and 7). These recontoured slopes will prevent the occurrence of standing water, increase surface water runoff, reduce permeability, and facilitate rapid runoff from the landfill into adjacent undisturbed lands.

### *Soils*

The soils used for the cap will be clay type content soils that have a high compaction capacity to prevent infiltration. Following the recontouring, but before hydroseeding occurs, a representative soil sample will be collected and sent in to a laboratory for soil content identification and compaction/infiltration rate capacities.

### *Compaction*

Once the cap topography and slopes have been found to be acceptable, heavy machinery will roll and compact the upper layer of the cap to the greatest extent possible.

### *Topsoil & Hydroseeding*

The cap will be covered with a final layer of 6-inches of topsoil to enable the establishment of a hydroseeded grass covering (Figures 5, 6 and 7).

### *As-Built*

Following the creation of the final mounded cap, the City will provide an as-built that includes photographs (pre and post construction). The achieved soil permeability will be noted in the as-built report along with the achieved slopes of the cap.

### *Steep Slopes & Margins*

The steep slopes along the margins adjacent to the landfill cap create a potential for disturbance to soils, underlying landfill materials, the existing tree and shrub canopy stabilizing the slopes, and the adjacent wetlands. Therefore, these areas are not to be mowed or disturbed (Figure 8).

The steep slopes of the landfill where mowing is impracticable have generated invasive species that include: poison hemlock, Japanese knotweed, and hedge bindweed. Over the past three years, noxious weed control in these areas has been an ongoing project for the City's Parks Department with noticeable success. Therefore, noxious weed control along the steep sides of the landfill will continue to be implemented as part of their ongoing maintenance (Figure 8).

The margins of the landfill along the north and northeastern side of the natural drainage also have generated invasive species that create a competing seed bank for the cap and the adjacent forest lands. On 14 October 2009, ATSI, the City, and Skagit County staff met on site to discuss combating the invasive species in this



location. It was agreed that a path would be graded to allow access for a mower and the noxious weeds in this location were to be mowed as short as possible. It was further agreed upon that an existing row of red alders would be allowed to remain, additional alders would be planted in a row along the edge where they are lacking, and volunteer alders would be allowed within the interior of the area dominated by invasive species in order to promote shading and to outcompete and inhibit the reestablishment and dominance of invasive species (Figure 8).

### **Monitoring: Drainage Inspections & Test Sampling**

Following the recontouring of the cap, a drainage inspection will be performed during the wet season. A diagram will be provided to Skagit County that shows where the drainage from the capped landfill is flowing. ATSI and the City will confer with Skagit County staff to determine the most logical sites for test sampling.

Test sampling will occur at least 2 times, once after closure and once after 5 years. Test samples will include pH, metals, nitrates and nitrites, sulfides, low level vinyl chloride, and VOC.

### **Public Safety/Access**

Hazards created by landfill debris in the uplands and wetlands have been addressed by consideration of public safety as well as the need to implement methods which minimize the potential disruption of soil and debris. The methods proposed below address fencing, exposed miscellaneous debris, the glass debris field, and signage.

#### *Fencing*

Fencing adjacent to the cap and hydroseeded area will be maintained in order to continue to limit public access into the main cap area (Figure 3).

#### *Exposed Miscellaneous Debris*

Deeply buried materials such as large metal debris will not be pulled out due to the potential disruption to soils and other buried materials. Instead, those portions sticking up above ground will be cut off and removed wherever possible.

Miscellaneous debris that is exposed at the surface but is not deeply buried (large pieces of concrete or metal) will be removed and hauled off when it is practical and cost effective to do so.

#### *Glass Debris Field*

Large areas of glass within the wetland also will not be removed due to the likelihood for disruption of soils. Instead natural physical controls, such as log barriers or obnoxious natural barriers (woody debris, tree limbs, etc.) will be implemented as public deterrents at discrete points of obvious access, such as preexisting paths or trails (Figure 4).



### *Signage*

Signs may also be installed to deter persons from deliberately investigating the landfill. In order not to create an attractive nuisance, signage referring to "Native Plant Restoration Area" is preferred to any references to the actual landfill or areas of debris.

## **Annual Maintenance, Management, and Reporting**

### *Annual Maintenance*

Mowing of the grass on the mounded cap will occur twice annually for 10-years (2119) to prevent trees and shrubs from growing on the cap (Figure 8). Fencing adjacent to the new cap and hydroseeded area will be maintained in order to continue to limit public access into this area (Figure 3).

### *Adaptive Management*

Yearly on-site visits will be made by City staff during the wet season to determine if there are issues relevant to the functioning of the final cap (such as differential areas requiring more fill), public safety, testing sampling points, or noxious weed control areas that would require further adjustment or improvements.

### *Reporting*

A 5-year follow-up will be provided to Skagit County that addresses the results of the 5<sup>th</sup> year test sampling results, any issues discovered during the course of the annual inspections, and any improvements or changes made therein.

A 10-year follow-up will be provided to Skagit County that discusses any additional issues discovered and improvements or changes made to the A Avenue Landfill.

Following the 10-year follow-up, if there are no further issues needing to be addressed, Skagit County will make a determination as to whether or not the annual maintenance occurring on the cap may be allowed to cease. Should no further action be required and should annual maintenance cease, the establishment and succession of native plants will be allowed to progress on the cap until the A Avenue landfill successfully blends into the adjacent forest lands.



**FIGURES**