UNITED STEELWORKERS

UNITY AND STRENGTH FOR WORKERS

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May 19, 2015

Docket Coordinator, Headquarters
U.S. Environmental Protection Agency
CERCLA Docket Office (Mail Code – 5305T)
1200 Pennsylvania Avenue, NW
Washington, DC 20460

RE: NPL Proposed listing of the Columbia Falls Aluminum Company Plant (a/k/a Anaconda Aluminum Co. Columbia Falls Reduction Plant) in Flathead County, Montana

Dear Docket Coordinator:

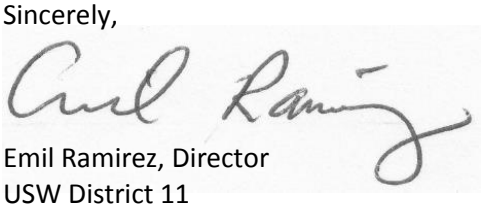
The attached comments are submitted by the United Steelworkers in support of officially including the Columbia Falls Aluminum Plant on the Superfund National Priorities List (NPL).

The United Steelworkers (USW) represents 850,000 workers in North America employed among industries that include metals, rubber, chemicals, paper, oil refining, glass, plus the service and public sectors. As a labor union, we understand that safe communities and safe workplaces go hand in hand. We have a long history of advocating for cleaning up work places from toxic releases on behalf of our members who work in smelters and live in surrounding communities.

In keeping with our philosophy that a sustainable economy is dependent upon a sustainable environment, we provide background data that may assist in site characterization at the Columbia Falls Aluminum Company Plant property. We also offer recommendations to ensure that the Remedial Investigation and Feasibility Study (RI/ FS) and eventual remedial activities will support the local economy, property values and the long-term health of the public, area wildlife and the region's unique, sensitive ecosystems.

We thank you in advance for considering our comments.

Sincerely,



Emil Ramirez, Director
USW District 11

ER:jmr

Enclosures – Three copies of USW comments w/attachments

United Steelworkers Comments on the Proposed Listing of the Columbia Falls Aluminum Company Plant in Flathead County, Montana to the Superfund National Priorities List

The following comments are organized as follows:

- Background
- Site characterization and nature of waste
    - Historic knowledge of primary aluminum smelter sites
    - Estimated emissions of fluoride and polycyclic aromatic compounds from smelters using stud Soderberg cells
    - Comparison of TRI releases from other (technically similar) smelters
    - Asbestos and other concerns
- Protection of wildlife and public health
    - Expanding sampling program
- Hunting
    - Ensuring healthy consumption/opportunities for testing
- Economic opportunities
    - Use of local workforce in remedial investigation/cleanup
- Remedial goals tied to protecting nature and economic sustainability

Background, Site Characterization and Nature of Waste

Background

The Columbia Falls Aluminum Company (CFAC) plant property, owned by Glencore since 1999, is situated on approximately 3,200 acres. The plant operated on approximately 800 acres.[i] According to EPA's Hazardous Ranking Score (HRS) Documentation Record, most of the analytical focus to date has been on five source areas that contain hazardous substances where historic releases to ground and surface water had occurred. It was noted that additional areas to investigate include: six landfill areas, three ponds, storage tanks, a waste pile area and the cathode pits. The initial investigation has detected a number of hazardous substances, including, but not limited to: Aroclor 1254 (a PCB), arsenic, cadmium, chromium, manganese, zinc and cyanide. The list of constituents will likely increase as further analyses is conducted and other sources, such as air deposition, are considered and appropriately evaluated.

The United Steelworkers (USW) has long-represented workers at aluminum smelters and we are familiar with the processes, as well as the inherent hazards that exist at such facilities. While all

aluminum smelters use the Hall-Heroult process, the technology has evolved over the years. Older smelters, including the Columbia Falls facility, used cells that employed the Soderberg technology. This technology (not pre-bake), was less efficient and most smelters in North America that used it have been shuttered.

These older smelters used either the Horizontal stud Soberberg (HSS) or Vertical stud Soderberg (VSS). The following table provides details of the most similar smelters. [ii, iii]

Facility	Location	Capacity (TPY)	Cell Type	Years Operated
Columbia Falls Aluminum Co (former Anaconda Alum. Co)	Columbia Falls, MT	180,000 (185,000 after 1965)[iv]	VSS	1955-2009
Martin Marietta Aluminum, Inc.	The Dalles, OR	90,000	VSS	1958-1984
Martin Marietta Aluminum, Inc.	Goldendale, WA	120,000	VSS	1970-2003
Alcoa (Massena East) (former Reynolds Metals Co.)	Massena, NY	126,000	HSS	1958-present

Since these facilities are similar, it seems likely that the chemicals/chemical wastes associated with production would be comparable. However, some variables that may impact site characterization include: production volume, source materials and products used, waste disposal practices, emission controls (and maintenance of), neighboring industrial activities, soil types, vegetation, hydro-geologic makeup, weather conditions, and other factors.

Primary contaminants identified at similar smelters

Martin Marietta Aluminum, Inc., The Dalles, OR [v, vi, vii, viii]

Arsenic
Asbestos
Cyanide
Fluoride
Metallic waste
Lead
Sulfate
Zinc
bis(2-ethylhexyl)phthalate
butylbenzophthalate
di-n-octylphthalate,
dibenzofuran
LPAHs (total) - in river sediments adjacent to the site
5000 tons of spent potliner materials- (cathode waste) containing cyanide, polycyclic aromatic hydrocarbons (PAHs), and arsenic.

Martin Marietta Aluminum, Inc., Goldendale WA [ix, x]
(Based on pond studies only)

Aluminum
Antimony
Arsenic
Cyanide
Fluoride
Nickel
Sulfate
PAHs

Alcoa Massena East, Massena, NY [xi, xii, xiii]

Asbestos and asbestos containing materials
Cyanide
Furans
Aluminum and other metals
PCB's- primarily from hydraulic fluid and electrical equipment (20,200 pounds of PCBs removed from adjacent St. Lawrence River) [xiv]
PAHs
Sulfate

EPA Estimates of Emissions from Smelters Employing Stud Soderberg Cells

As mentioned in the table on page 2, three of the four smelters began operation in the 1950s, prior to the establishment of EPA in 1970. In 1979, EPA issued draft guidelines for control of fluoride emissions from these and other existing primary aluminum plants.[xv] This document contained a table with estimations of fluoride pot room emissions in 1975. [xvi] To follow is the excerpted relevant information from that table:

Ratio of Fluoride Emissions from Controlled & Uncontrolled Aluminum Pot Rooms in 1975

Cell Type	Pounds of Fluoride per ton of Aluminum
Horizontal stud Soderberg	5.7
Vertical stud Soderberg	5.2

Based on these estimates, running at full capacity, the Columbia Falls smelter, with a production capacity of 180,000 tons, would have generated fluoride emissions of **936,000 pounds a year, beginning in 1955.**

These estimates may be under-calculated since another table,[xvii] in the same 1979 document, noted that total fluoride emissions before any retrofit of this particular smelter would have been 5.3 pounds of fluoride per ton of aluminum produced.

In preparation of proposed MACT standards for the primary aluminum industry, EPA published a technical support document in 1996 that examined all primary aluminum production plants operating in the US at the time.[xviii] Based on a survey of these plants, the major hazardous air pollutants (HAPS) identified were **hydrogen fluoride** (generated from fluoride compounds used in production operation) and **polycyclic organic matter (POM)** (primarily from coal tar pitch). Other HAPs reported to be associated with the primary aluminum industry were **benzene, cyanide, metal compounds, phenol, toluene and xylene**.[xix]

Generally speaking, the four stud Soderberg smelters were "grandfathered" and therefore exempt from the Clean Air Act's most stringent emission limits for hydrogen fluoride.[xx] However, the state of Montana imposed a limit of 2.6 pounds of total fluoride/ton of aluminum produced.[xxi] Running at full capacity, this limit would result in yearly emissions of total fluoride of **468,000 pounds per year at the Columbia Falls smelter.**

Self-Reported Releases for Some Chemicals Began in 1987

The Emergency Planning and Community Right-To-Know Act of 1986 required covered facilities to report annual releases of regulated chemicals to EPA under the Toxic Release Inventory (TRI), beginning in 1987. While there are some limitations on reporting requirements, as well as concern that self-reported releases may not be accurate, the TRI gives the public a sense of some of a facility's toxic releases.

We used the TRI[xxii] to compare releases of the smelters previously mentioned as being the most similar to the Columbia Falls, MT smelter, (minus Martin Marietta Plant in The Dalles, OR, which closed in 1984, prior to TRI requirements).

Facility	Years of Releases	Capacity (TPY)
Columbia Falls Aluminum Co. Columbia Falls, MT	1988-2009	180,000 (185,000 after 1965)[xxiii]
Martin Marietta Aluminum, Inc., Goldendale, WA	1988-2003	120,000
Alcoa (Massena East) (former Reynolds Metals Co.) Massena, NY	1988-2009 (presently slated for closure)	126,000

Contaminants Identified at Other Similar Smelter Sites

It was interesting to discover that there was such disparity in the chemicals reported by these three similar smelters. To follow are a few examples:

Anthracene: Reported by only the Columbia Falls, MT plant - **2001-2005.- 7,294 pounds total: 6,151 pounds to air and 1,143 pounds to surface impoundment**

Benzene: Reported by only the Massena, NY plant. **2001-2008 - 225,600 pounds to air**

Chlorine: Reported by the Massena NY plant. **1988-2003 - 51,626 pounds -air and surface water**
Reported by the Goldendale, WA plant. **1988-1997- 36,670 pounds to air**

Cyanide: Reported by the Massena, NY plant. **2005-2008 - 37 pounds to surface water**
Reported by the Columbia Falls plant. **1991-1995 - 2,350 pounds to surface water**

Hydrogen fluoride: Columbia Falls plant **failed to report releases in 2001, 2005, 2006 and 2009**

Lead: Reported by the Massena, NY plant. **2001- 2009 – 1,139 pounds to air**
Reported by the Goldendale, WA plant only in **2001- 359 pounds to air**

Manganese: Reported by only the Massena plant. **1988-2007 - 3,985 pounds to air and 250 to water**

PCBs: Reported by only the Massena, NY plant in **2001 - 1,600 pounds to onsite land**

Polycyclic Aromatic Compounds:
Reported by the Massena, NY plant. **1995-2009 - 590,570 pounds to air and 753 to surface water**
Reported by the Goldendale, WA plant.. **2000-2009 - 8,419 pounds to air only**
Reported by the Columbia Falls, MT plant. **1995-2009 - 192,797 pounds total to air, water , surface impoundment**

Comparison of TRI-reported Hydrogen fluoride On-site Releases

Facility	Hydrogen fluoride (HF) Released to air	Capacity TPY	Notes on reporting years
Columbia Falls Alum. Co. (MT)	**4,055,996 pounds**	180,000 (185,000 after 1965) [xxiv]	1988-2009 Failed to report HF in 2001, 2005, 2006, 2009 (closed in 2009 but reported other chemical releases)
Martin Marietta Alum. (WA)	**515,731 pounds**	120,000	1988-2003 Closed in 2003
Alcoa (Massena East) NY	**2,450,870 pounds**	126,000	1988-2009 For comparison purpose, we did not include releases reported after 2009

Comparison of TRI-reported Onsite Releases of Polycyclic Aromatic Compounds

Facility	**Polycyclic Aromatic Compounds**	Capacity TPY	Notes
Columbia Falls Alum. Co. (MT)	**192,797 pounds**	180,000 (185,000 after 1965)	Reported only in1995-2009 Total reflects releases to air, water and surface impoundment
Martin Marietta Alum. (WA)	**8,419 pounds**	120,000	Reported only in 2000-2003 Reported to air only
Alcoa (Massena East) NY	**581,323 pounds**	126,000	Reported to air and to surface water

While TRI data does not, by any means, provide a comprehensive picture of onsite contamination, it might be helpful in better understanding some of the contaminants that may be present. To assist EPA in that effort, we have developed (and attached) more detailed charts of onsite TRI -reported releases for each of the three similar smelters. Since the Columbia Falls smelter has a much larger capacity than the other two smelters, one might assume that the reported releases would be greater for all reported chemicals; but this was not always the case. Also, the other two smelters reported chemical releases that the Columbia Falls plant did not – for example: **benzene, chlorine, chromium, copper, manganese, zinc, lead and PCBs.**

It seems reasonable to consider that if one smelter has reported releases of a chemical, it should be added to the list of constituents to be investigated at the Columbia Falls Aluminum site.

Summary and Recommendations regarding On-site Releases

Analyzing the waste disposal and onsite releases of similar smelters could be a useful approach to better understand which hazardous chemicals may be present on and around the Columbia Falls Aluminum plant site.

Disposal areas that contain waste and other materials are fairly easy to identify due to historic records and worker knowledge. However, the contribution of airborne contaminants can pose significant impacts far from the source of generation, as they accumulate on and in surface soils and vegetation. Dispersion modeling should be used as a predictive tool to aid in identifying areas where heavy atmospheric deposition could have occurred. This may be particularly important for hydrogen fluoride since this gas can travel great distances and result in potentially high concentration of fluoride in soils, in groundwater, and on and in vegetation, where it can be ingested by wildlife. Using EPA estimated emissions of fluoride, in the early years of operation

alone (1955-1980), running at full capacity, the Columbia Falls Aluminum plant would have emitted **23,400,000 pounds (11,700 tons) of fluoride**. This calculation is based on 936,000 pounds per year for 25 years. (See page 3.)

The 3,200 acre Columbia Falls smelter site provides habitat for many mammals (e.g. elk, deer, moose, black bear) that can be adversely affected by fluoride (dental and skeletal fluorosis and decreased milk production). [xxv] Since some studies have shown that fluoride uptake in a variety of plants is increased by the presence of aluminum in the soils,[xxvi] it seems important to identify areas where fluoride may have concentrated and accumulated in foliage. Grasses and other vegetation upon which terrestrial wildlife might graze should be analyzed to determine if remediation or other protective measures are necessary to protect animals.

Some Polycyclic Aromatic Compounds, specifically Polycyclic Aromatic Hydrocarbons (PAHs) are known to be "carcinogenic, mutagenic or teratogenic to a wide variety of organisms, including fish, and other aquatic life, amphibians, birds and mammals." [xxvii] Historic field studies show that some PAHs can travel some distance from the site and be deposited on vegetation. A 1982 study found that lettuce (Lactuca sativa) contained concentrations of **PAHs of 654 ppb (fresh weight) at a distance of 0.5 to 1.5 kilometers (km) from an aluminum smelter and 128 ppb at a distance of 2.0 to 6.5 km from the smelter**.[xxviii]

Asbestos Concerns

Asbestos was used throughout the smelting industry, and as a result, many workers have suffered, and continue to suffer, from asbestos- related diseases, such as asbestosis and mesothelioma. While EPA has already acknowledged that there is an asbestos landfill onsite, soils and groundwater may be at risk from asbestos and asbestos containing materials (ACM) elsewhere on the property.

Recommendations regarding Asbestos and ACM:

- All personnel visiting or working on the site should be made aware that asbestos is likely to be present.
- Workers, including those collecting samples, should be properly trained in identifying and addressing asbestos dangers.
- Asbestos monitoring and the use of proper personal protective equipment (PPE) should be mandatory and diligently enforced.

- Prior to the demolition of buildings, a thorough asbestos investigation should be conducted to determine if and where asbestos and ACM might be present.

Wildlife and Public Health

Much of the 3,200 acres of the site is undeveloped and is therefore attractive to, and abundant with, wildlife and sensitive ecosystems. East of Teakettle Mountain, the property features wetlands, woodlands/forest, Cedar Creek and the Flathead River (from which locals harvest and consume fish and which also supports the federally protected /threatened bull trout[xxix]). These diverse ecosystems offer many sampling opportunities that may be important in understanding how various contaminants are moving through the site/ecosystems and how they might impact different flora and fauna, as well as humans.

Recommendations Regarding Protection of Wildlife and Public Health

Groundwater is used as a drinking water source for both municipal and private residents[xxx] and elevated levels of cyanide were detected in at least 2 area domestic wells.[xxxi] These findings indicate the need for an expanded groundwater investigation to determine the fate and migration of site-related contaminants to protect public health and monitor the impact on interconnected surface water bodies to protect wildlife.

Since both humans and wildlife depend on fish from the River and streams, fish tissue samples should be taken to determine contaminant loads in various species. These findings may determine if bioaccumulation presents health risks that warrant fish consumption advisories for particular species.

The jawbones and teeth of dead animals (such as elk and deer) found on the site, should be collected, examined for signs of fluorosis and appropriately tested. A detailed log of findings should be maintained.

Necropsies and tissue sampling should be conducted on dead wildlife found on or near the site to determine toxic body burdens.

Hunting

Hunting is permitted on the west and north sides of the facility.[xxxii] Youth hunting (for those who will reach 12 years of age by Jan 16, 2016) was permitted on the South Half Block Management Area from Sept. 1 –Dec. 31, 2014. Youth hunting opportunities included white-tail deer, mule deer, elk, upland game birds, black bear and turkey.[xxxiii]

The sport of hunting is one that for generations has been enjoyed in many rural areas. It is an activity that allows people to appreciate nature and better understand it. Many who hunt game also find it a rewarding way to provide food for their families.

Recommendations Related to Hunting

Since hunting is permitted on the site, it seems important to ensure that wildlife is safe for consumption, particularly for children and the yet-to be born. A number of approaches could be utilized to ensure its safety, while simultaneously learning more about how contaminants may be moving through the site, including through wildlife.

A system should be developed to track the discovery of dead animals. Hunters should be advised to report the finding of any dead creatures to Montana Fish, Wildlife and Parks. Appropriate follow up testing should be conducted to determine cause of death and/or toxic body burdens.

In the event that toxic body burdens are discovered in species being hunted and consumed, appropriate health advisories should be issued and provided to those hunting onsite to help curtail the consumption of tainted game.

Hunters should be encouraged or required to submit jawbones or teeth of deer or elk, or other game, either through an incentive program or as a condition of their permit to hunt on the property. Jawbones and teeth could then be studied to determine the potential impact of fluoride (fluorosis) on area animals.

Economic Background

At one time, the Columbia Falls smelter provided good paying jobs for some 1,500 workers. It was not uncommon to hear a worker say that both his father and grandfather had worked at the plant. However, that trend came to an end in the 1980s due to many market circumstances. In the years that followed, 10 of the Pacific Northwest's aluminum smelters closed down.[xxxiv] In an effort to keep the smelter operating, elected officials spent years trying to convince Bonneville Power Authority (BPA) to provide cheap power to the smelter.[xxxv] When Glencore purchased the plant in 1999, some employees questioned the fate of their employment. On January 18, 2001, it was announced that the smelter "had signed a power remarketing deal with BPA" and that all remaining potlines would be shut down by January 26th. Instead of operating, the company would be selling the power back to BPA. "According to some sources, Glencore made $350 million to $450 million on that deal." [xxxvi]

Then, for a brief time, as the power market stabilized, Glencore gradually restarted operations and by May of 2002, the smelter was running at 60% capacity. However, in March of 2003, citing enduring high power costs and competition from China, Glencore announced plans to shut

two of its three running potlines, leaving only about 150 employees on the job. Then in October of 2009, the plant made its last aluminum. Over the next several years, Glencore continued to spread optimism that the smelter would reopen. Again, union workers at the plant, along with elected officials Senators Max Baucus and Jon Tester tried to encourage BPA to offer the company a feasible power contract.[xxxvii] After environmental investigations in 2013 uncovered contamination problems, MT DEQ sent a Consent Order to Glencore in July of 2014 outlining its cleanup expectations. Within months, Glencore hired a firm, Roux Associates, to oversee remedial investigation of the site "and announced that it 'is no longer negotiating' with DEQ." On March 3, 2015, Columbia Falls Aluminum Co. announced that it would not reopen and that some buildings would be demolished as part of the closure.[xxxviii] This announcement angered many[xxxix] as they had been on an economic and emotional rollercoaster for years- believing that the smelter would someday reopen and bring good-paying jobs back to the community.

Many workers continue to be out of work and are greatly in need of employment.

Recommendations for Economic Opportunities

While future use of the site remains uncertain, the remedial investigation and eventual cleanup of the site may offer a number of short-term and long-term opportunities for local employment. We believe employing a local workforce, including former workers is important for a variety of reasons:

- Local residents have a personal stake in ensuring that the site is properly investigated and appropriately cleaned up.
- Former employees are familiar with the buildings, the equipment and many of the related hazards, such as asbestos.
- Former employees have the most knowledge about old disposal areas and other areas of concern.
- Locals know the "lay of the land" and are familiar with important features that "outsiders" are not.

Remediation with Eyes on the Future

Located at the gateway to Glacier National Park,[xl] the area's abundant natural resources make it unique. Because of this, the remedial investigation should be ever-focused on the long-term goal of full restoration. Given the area's unique, irreplaceable natural resources and numerous sensitive ecosystems, the remedial goal should not even consider cleaning up the site to

"industrial levels," as they are not appropriate for this site. More stringent cleanup levels should be established in an effort to attract clean industries, protect workers who may be employed at a future facility on the site, and to protect the area's wildlife.

The area attracts people from all over the world because of its beauty and wildlife. Given the area's abundant natural resources, a clean, healthy site that is safe for people and wildlife alike, will offer endless development opportunities for safe, sustainable jobs that respect and even utilize the area's vast natural resources.

This approach may also offer unique remedial opportunities, for example: bioremediation through the use of organisms, either microbial or vegetative. Numerous studies have shown that some plants tend to uptake more fluoride than others.[xli] The same is true for metals and Polycyclic Aromatic Compounds.[xlii] A fairly non-invasive pilot remediation project could involve the planting and eventual harvesting of specifically identified species for which the uptake is high for the target contaminants. The objective would be to allow the plants to remove pollutants from the subsurface soils, harvest the vegetation and then either recover or destroy the contaminants. This labor-intensive work could be accomplished with a local workforce, perhaps in cooperation with colleges or universities in Montana.

Unless this site is listed on the Superfund National Priority List, it is not likely to be remediated to the level it deserves. Therefore, USW strongly supports including it on the NPL to ensure that it is adequately investigated and eventually cleaned up to a condition that is safe for humans, protective of wildlife and supportive of sustainable economic growth.

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[i] Flathead Beason. , Tristan Scott *Superfund: Success Story or Stigma* 3/31/15

[ii] EPA, Office of Air Quality, *Primary Aluminum Draft Guidelines for Control of Fluoride Emissions from Existing Primary Aluminum Plants* Publication No.EPA-450/2-78-04a, February 1979

[iii] Dates of operation were obtained from various sources, including EPA site-specific fact sheets.

[iv] Columbia Falls Aluminum Company Operating Permit, which may reflect expansion to 185,000 TPY

[v] Oregon DEQ Environmental Cleanup Site Information (ECSI) Database Site Summary Report - Details for Site ID 2440, Goldendale Aluminum Co. http://www.deq.state.or.us/lq/ECSI/ecsidetail.asp?seqnbr=2440

[vivi] EPA Region 10 Fact Sheet for the "Former Martin-Marietta Aluminum Reduction Facility , updated 4/17/15

[vii] EPA Region 10, Fact Sheet EPA ID# ORD052221025, Sept 2007 http://yosemite.epa.gov/r10/nplpad.nsf/88d393e4946e3c478825631200672c95/9282ee86a70b9f95852565940069786b

[viiiviii] EPA Reg. 10, Office of Environmental Cleanup, *Five Year Review Report (4th Report) for the …Martin Marietta Company Reduction Facility, The Dalles, Wasco County, Oregon Covering Jan 2005- Dec 2012 dated 5/15/13*

[ix] EPA Reg. 10, Documentation lf Environmental Indicator Determination RCRA Corrective Action Environmental Indicator 2/5/99

[x] Lockheed Martin Cleanup Action Plan NPDES Ponds, Goldendale, WA July 2008 http://www.lockheedmartin.com/content/dam/lockheed/data/corporate/documents/remediation/goldendale-cleanup-action-plan-NPDES-July2008.pdf

[xi] St. Lawrence River Environment Natural Resource Damage Assessment Restoration and Compensation Determination Plan and Environmental Assessment , page 1.9, section 1.5.3 http://www.darrp.noaa.gov/pdf/stlrrcdp_final_main_November_272012.pdf

[xii] EPA Reg 2 , Superfund Reynolds Metals Company fact sheet, 6/22/2012

[xiii] US Dept. of Commerce Office of Response and Restoration, Page 1 http://response.restoration.noaa.gov/about/media/alcoa-aluminum-factories-settle-194-million-pollution-st-lawrence-river-watershed-mo st-w

[xiv] EPA Reg 2 Superfund Fact Sheet for Reynolds Metals Company, Massena, NY 6/22/2012

[xv] EPA Office of Air Quality Planning and Standards, *Primary Aluminum Draft Guidelines for Control of Fluoride Emissions from Existing Primary Aluminum Plants, February 1979*

[xvi] Ibid. Page 1-8

[xvii] Ibid. Page 1-10

[xviii] US EPA Office of Air Quality Planning and Standard, Emission Standards Div., *Primary Aluminum Industry: Technical Support Document for Proposed MACT Standards, July 1996* *http://www.epa.gov/ttn/atw/alum/alum-tsd.pdf*

[xix] Ibid. Page 2-22

[xx] Ibid.

[xxi] Ibid. Page 2-23

[xxii] EPA TRI Explorer http://iaspub.epa.gov/triexplorer/tri_release.facility

[xxiii] Columbia Falls Aluminum Company Operating Permit, which may reflect expansion to 185,000 TPY

[xxiv] Columbia Falls Aluminum Company Operating Permit, which may reflect expansion to 185,000 TPY

[xxv] ATSDR Toxicological Profile on Fluorides, Hydrogen Fluoride and Fluorine, http://www.atsdr.cdc.gov/toxprofiles/tp11.pdf

[xxvi] Ibid. Page 216

[xxvii] US Fish and Wildlife Service, Polycyclic Aromatic Hydrocarbon Hazards to Fish, Wildlife and Invertebrates: A Synoptic Review http://www.pwrc.usgs.gov/oilinla/pdfs/chr_11_pahs.pdf Report # 11 May 1987

[xxviii] US Fish and Wildlife Service, Polycyclic Aromatic Hydrocarbon Hazards to Fish, Wildlife and Invertebrates: A Synoptic Review http://www.pwrc.usgs.gov/oilinla/pdfs/chr_11_pahs.pdf Report # 11 May 1987

[xxix] EPA HRS Documentation Record for the Anaconda Aluminum Co Columbia Falls Reduction Plant , Page 20

[xxx] Ibid. Page 21

[xxxi] EPA Reg. 8 Site Fact Sheet on Columbia Falls Aluminum Reduction Plant, December 2014

[xxxii] EPA HRS Documentation Record for the Anaconda Aluminum Co Columbia Falls Reduction Plant. Page 21

[xxxiii] Montana Fish, Wildlife & Parks, Region 1.Regulations for Columbia Falls Aluminum Company South Half BMA #6

[xxxiv] Hungry Horse News, "From Boom to Bust: A Short History of CFAC," Richard Hanners, March 5, 2015

[xxxv] Ibid

[xxxvi] Ibid.

[xxxvii] Flathead Beacon, "Union Officials: Glencore's Promises to Reopen were 'A Sham'" , Tristan Scott, March 11, 2015

[xxxviii] Hungry Horse News, "From Boom to Bust: A Short History of CFAC," Richard Hanners, March 5, 2015

[xxxix] Flathead Beacon, "Union Officials: Glencore's Promises to Reopen were 'A Sham'" , Tristan Scott, March 11, 2015

[xl] Ibid

[xli] ATSDR Toxicological Profile on Fluorides, Hydrogen Fluoride and Fluorine, http://www.atsdr.cdc.gov/toxprofiles/tp11.pdf

[xlii] US Fish and Wildlife Contaminant Hazard Reviews, (Synoptic Reveiws cover various contaminants, publication numbers 85(1.1 -1.12)

Columbia Falls Aluminum Plant Onsite Releases as Reported to the Toxic Release Inventory
1988-2009

Company-Reported Hydrogen Fluoride (HF) Releases to Air from Columbia Falls Aluminum Plant
1988-2009
(All releases are reported in pounds)

Year	Fugitive Emissions	Point Source Emissions	Total HF Air Releases
1988	263,074	19,710	282,784
1989	336,000	17,000	353,000
1990	351,000	21,100	372,100
1991	306,600	21,100	327,700
1992	303,400	13,450	316,850
1993	208,521	6,378	214,899
1994	251,400	6,205	257,605
1995	446,010	7,665	453,675
1996	201,562	3,726	205,288
1997	214,016	11,431	225,447
1998	227,182	8,763	235,945
1999	210,895	9,155	220,050
2000	202,544	6,888	209,432
2001	Not reported	Not reported	0
2002	153,560	1,017	154,577
2003	41,447	3,060	44,507
2004	26,836	431	27,267
2005	Not reported	Not reported	0
2006	Not reported	Not reported	0
2007	93,045	2,372	95,417
2008	58,029	1,424	59,453
2009	Not reported	Not reported	
Total for all years			**4,055,996**

Polycyclic Aromatic Compounds /PAH Releases Columbia Falls Aluminum Plant 1995-2009
All Releases Reported in Pounds --1995 is first year company reported Releases of PA Compounds

	Onsite Releases	Anthracene	Benzo (G,H,I)Perylene	Phenanthrene	Polycyclic Aromatic Compounds
1995	Air	0	0	0	9
	Surface Impoundment	0	0	0	0
1996	Air	0	0	0	20,128
	Surface Impoundment	0	0	0	0
1997	Air	0	0	0	24,963
	Surface Impoundment	0	0	0	0
1998	Air	0	0	0	24,622
	Surface Impoundment	0	0	0	1,320
1999	Air	0	0	0	31,404
	Surface Impoundment	0	0	0	81
2000	Air	0	3,440	53,698	33,095
	Surface Impoundment	0	0	0	0
2001	Air	255	141	2,441	1,360
	Surface Impoundment	250	0	250	743
2002	Air	2,723	967	15,114	9,303
	Surface Impoundment	250	0	1,179	2,037
2003	Air	1,449	475	7,458	4,562
	Surface Impoundment	250	0	750	966
2004	Air	724	279	4,354	2,683
	Surface Impoundment	143	0	392	677
2005	Air	1,000	277	4,324	2,667
	Surface Impoundment	250	0	372	642
2006	Air	0	213	0	2,055
	Surface Impoundment	0	226	0	1,770
	Other Land Disposal	0	94	0	734
2007	Air	0	971	0	9,341
	Surface Impoundment	0	606	0	4,804
2008	Air	0	666	0	6,405
	Surface Impoundment	0	445	0	3,529
2009	Air	0	122	0	1,175
	Surface Impoundment	0	52	0	422
Total		**7,294**	**8,974**	**90,332**	**192,797**

Other On-site Reported Releases Columbia Falls Aluminum Plant 1988-2009
(All releases are reported in pounds.)

	Onsite Releases	Aluminum Oxide (Fibrous forms) [1988 only]	Carbonyl Sulfide [1996+]	Cyanide [1991-1995]
1988	Air	2,552,560	-	-
1989		-	-	-
1990		-	-	-
1991	Surface Water	-	-	350
1992	Surface Water	-	-	500
1993	Surface Water	-	-	500
1994	Surface Water	-	-	500
1995	Surface Water	-	-	500
1996	Air	-	50,240	-
1997	Air	-	50,240	-
1998	Air	-	48,611	-
1999	Air	-	48,743	-
2000		-	46,066	-
2001		-	-	-
2002		-	-	-
2003		-	-	-
2004		-	-	-
2005		-	-	-
2006		-	-	-
2007		-	29,282	-
2008		-	-	-
2009		-	-	-
Total		**2,552,560**	**273,182**	**2,350**

On Site Releases 1988-2003 - Former Goldendale Aluminum Co. Klickitat County, WA.

	Onsite Releases	Aluminum Oxcide [Fibrous Forms]* [1988 only]	Benzo (G,H,I) Perylene* [2000+]	Carbonyl Sulfide* [1994+]	Chlorine	Hydrogen Fluoride	Lead* [2001 only]	Polycyclic Aromatic Compounds* [2000+]
1988	Air	3,375,000			2,750	18,279		
	Surface Impoundment	913,000			0	0		
	Surface Water	6,580			0	0		
1989	Air				3,410	19,611		
	Surface Impoundment				0	0		
	Surface Water				0	0		
1990	Air				3,960	20,021		
	Surface Impoundment				0	0		
	Surface Water				0	0		
1991	Air				7,800	109,247		
	Surface Impoundment				0	0		
	Surface Water				0	5		
1992	Air				2,835	45,482		
	Surface Impoundment				0	0		
	Surface Water				0	0		
1993	Air				4,320	16,000		
	Surface Impoundment				0	0		
	Surface Water				0	0		

On Site Releases 1988-2003 - Former Goldendale Aluminum Co. Klickitat County, WA.

	Onsite Releases	Aluminum Oxcide [Fibrous Forms]* [1988 only]	Benzo (G,H,I) Perylene* [2000+]	Carbonyl Sulfide* [1994+]	Chlorine	Hydrogen Fluoride	Lead* [2001 only]	Polycyclic Aromatic Compounds* [2000+]
1994	Air			82,185	4,607	28,442		
	Surface Impoundment			0	0	0		
	Surface Water			0	0	0		
1995	Air			97,090	2,370	28,751		
	Surface Impoundment			0	0	0		
	Surface Water			0	0	0		
1996	Air			94,000	1,588	25,000		
	Surface Impoundment			0	0	0		
	Surface Water			0	0	0		
1997	Air			96,000	3,030	36,400		
	Surface Impoundment			0	0	0		
	Surface Water			0	0	0		
1998	Air			93,000		51,600		
	Surface Impoundment			0		0		
	Surface Water			0		0		

On Site Releases 1988-2003 - Former Goldendale Aluminum Co. Klickitat County, WA.

	Onsite Releases	Aluminum Oxcide [Fibrous Forms]* [1988 only]	Benzo (G,H,I) Perylene* [2000+]	Carbonyl Sulfide* [1994+]	Chlorine	Hydrogen Fluoride	Lead* [2001 only]	Polycyclic Aromatic Compounds* [2000+]
1999	Air			95,000		53,200		
	Surface Impoundment			0		0		
	Surface Water			0		0		
2000	Air		1,100	90,000		52,800		6,600
	Surface Impoundment		0	0		0		0
	Surface Water		0	0		0		0
2001	Air		114	9,000		3,561	359	652
	Surface Impoundment		0	0		0	0	0
	Surface Water		0	0		0	0	0
2002	Air		160	10,000		5,890		754
	Surface Impoundment		0	0		0		0
	Surface Water		0	0		0		0
2003	Air		72	4,473		1,442		413
	Surface Impoundment		0	0		0		0
	Surface Water		0	0		0		0
	Totals	**4,294,580**	**1,446**	**670,748**	**36,670**	**515,731**	**359**	**8,419**

On Site Releases 1988-2009** - Massena East-Former Reynolds Metals Co. Massena, NY

	Onsite Releases	Anthracene* (1991+)	Benzo (G,H,I) Perylene* [2000+]	Benzene* [2001+]	Carbonyl Sulfide* [1999+]	Chromium* [2006+]	Chlorine	Copper	Cyanide Compounds* [2006+]	Hydrogen Fluoride	Lead* [2001+]	Manganese	Zinc Compounds	Polycyclic Aromatic Compounds* (1995+)
1988	Air						3,300	250		133,500		250	0	
	Surface Impoundment						0	0		0		0	0	
	Surface Water						3,100	0		0		0	4,400	
1989	Air						1,900	250		130,000		250	0	
	Surface Impoundment						0	0		0		0	0	
	Surface Water						3,100	0		0		0	5,100	
1990	Air						1,905	250		88,000		250	0	
	Surface Impoundment						0	0		0		0	0	
	Surface Water						4,500	0		0		0	5,000	
1991	Air	15,250					1,405	250		89,000		250	0	
	Surface Impoundment	0					0	0		0		0	0	
	Surface Water	0					2,800	0		0		0	6,000	
1992	Air	15,250					1,405	250		88,000		250	0	
	Surface Impoundment	0					0	0		0		0	0	
	Surface Water	0					3,000	0		0		0	4,649	
1993	Air	14,360					1,650	255		83,000		250	0	
	Surface Impoundment	0					0	0		0		0	0	
	Surface Water	0					2,000	0		0		0	4,000	

On Site Releases 1988-2009** - Massena East-Former Reynolds Metals Co. Massena, NY

	Onsite Releases	Anthracene* (1991)	Benzo (G,H,I) Perylene* [2000+]	Benzene* [2001+]	Carbonyl Sulfide* [1999+]	Chromium* [2006+]	Chlorine	Copper	Cyanide Compounds* [2006+]	Hydrogen Fluoride	Lead* [2001+]	Manganese	Zinc Compounds	Polycyclic Aromatic Compounds* (1995+)
1994	Air						760	255		58,000		255		
	Surface Impoundment						0	0		0		0		
	Surface Water						1,900	0		0		0		
1995	Air						760	255		58,000		82		120,250
	Surface Impoundment						0	0		0		0		0
	Surface Water						1,200	0		0		0		75
1996	Air						440	0		58,000		0		120,250
	Surface Impoundment						0	0		0		0		0
	Surface Water						980	0		0		0		75
1997	Air						540	0		60,000		250		110,250
	Surface Impoundment						0	0		0		0		0
	Surface Water						2,900	250		0		250		75
1998	Air						530	0		68,000		1,000		140,250
	Surface Impoundment						0	0		0		0		0
	Surface Water						3,200	250		0		0		250
1999	Air				240,000		495	0		490,000		92		36,750
	Surface Impoundment				0		0	0		0		0		0
	Surface Water				0		2,600	250		0		0		250

On Site Releases 1988-2009** - Massena East-Former Reynolds Metals Co. Massena, NY

	Onsite Releases	Anthracene* (1991)	Benzo (G,H,I) Perylene* [2000+]	Benzene* [2001+]	Carbonyl Sulfide* [1999+]	Chromium* [2006]	Chlorine	Copper	Cyanide Compounds* [2006+]	Hydrogen Fluoride	Lead* [2001+]	Manganese	Zinc Compounds	Polycyclic Aromatic Compounds* (1995+)
2000	Air		1,650		268,000		515	0		203,900		97		11,800
	Surface Impoundment		0		0		0	0		0		0		0
	Surface Water		0		0		3,000	250		0		0		10
2001	Air		545	29,000	245,000		380	8		125,900	150	73		6,590
	Surface Impoundment		0	0	0		0	0		0	0	0		0
	Surface Water		0	0	0		1,600	14		0	0	0		1
2002	Air		524	29,000	267,000		440	10		93,900	140	86		6,300
	Surface Impoundment		0	0	0		0	0		0	0	0		0
	Surface Water		0	0	0		1,200	12		0	0	0		1
2003	Air		480	25,800	234,000		441	10		84,800	139	91		5,760
	Surface Impoundment		0	0	0		0	0		0	0	0		0
	Surface Water		0	0	0		680	61		0	0	0		5
2004	Air		470	25,800	223,000			12		80,400	130	105		5,650
	Surface Impoundment		0	0	0			0		0	0	0		0
	Surface Water		0	0	0			32		0	0	0		4
2005	Air		520	29,000	267,000			12	0	107,100	150	105		6,310
	Surface Impoundment		0	0	0			0	0	0	0	0		0

On Site Releases 1988-2009** - Massena East-Former Reynolds Metals Co. Massena, NY

	Surface Water		0	0	0			10	10	0	0	0		2

	Onsite Releases	**Anthracene* (1991)**	**Benzo (G,H,I) Perylene* [2000+]**	**Benzene* [2001+]**	**Carbonyl Sulfide* [1999+]**	**Chromium* [2006+]**	**Chlorine**	**Copper**	**Cyanide Compounds* [2006+]**	**Hydrogen Fluoride**	**Lead* [2001+]**	**Manganese**	**Zinc Compounds**	**Polycyclic Aromatic Compounds* (1995+)**
2006	Air		434	29,000	278,000	3		11	0	113,600	119	99		5,190
	Surface Impoundment		0	0	0	0		0	0	0	0	0		0
	Surface Water		0	0	0	0		10	9	0	0	0		2
2007	Air		507	29,000	257,000	3		10	0	94,100	140	92		6,150
	Surface Impoundment		0	0	0	0		0	0	0	0	0		0
	Surface Water		0	0	0	0		17	9	0	0	0		1
2008	Air		540	29,000	246,000	2		7	0	99,900	146	58		6,480
	Surface Impoundment		0	0	0	0		0	0	0	0	0		0
	Surface Water		0	0	0	0		41	9	0	0	0		1
2009	Air		217		97,000			3		43,770	25			2,590
	Surface Impoundment		0		0			0		0	0			0
	Surface Water		0		0			47		0	0			1
	Totals	**44,860**	**5,887**	**225,600**	**2,622,000**	**2,014**	**51,626**	**3,342**	**37**	**2,450,870**	**1,139**	**4,235**	**29,149**	**591,323**

1988	**Aluminum Oxide (Fibrous Forms)**	**Phosphoric Acid**
Air	262,000	0
Surface Impoundments	1,200,00	0

On Site Releases 1988-2009** - Massena East-Former Reynolds Metals Co. Massena, NY

**Only Reported That Year:

Surface Water	0	20,000

2001	Polychlorinated Biphenyls
Air	0
Surface Impoundments	0
Surface Water	0
Onsite Land	1,600