THE MONTANA STATE ALUMINUM INDUSTRY ECONOMIC IMPACT STUDY

DRAFT – FINAL REVIEW REQUIRED

Prepared for

The Pacific Northwest Aluminum Industry

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EXECUTIVE SUMMARY

The aluminum industry has been a fixture in the Pacific Northwest economy for the past sixty years. The purpose of this study is to estimate the economic importance of the aluminum industry to Flathead County in the State of Montana, which has one of the region's major aluminum plants. The year of analysis is 1998.

In 1998, the Pacific Northwest aluminum industry sold more than $3 billion worth of products and employed approximately 10,000 people in Oregon, Washington, and Montana:

- The aluminum industry in Montana engaged 620 workers. The Columbia Falls Aluminum Company accounted for virtually all of the industry's total employment in the state.

- Aluminum industry employees in Montana earned $24.4 million in wages and salaries (excluding non-wage benefits) in 1998. The average wage and salary was $39,620 per year, approximately 1.8 times the state average. Labor income (including non-wage benefits) totaled $28.9 million for an average of $47,070 per employee.

- In 1998, the aluminum industry's employment impact on the Montana economy extended beyond the 620 people working for the industry, since the industry's payroll and other operating expenditures created job opportunities in other businesses through the so-called multiplier (respending) process. With an estimated employment multiplier of 3.4, the industry's total economic impact amounted to approximately 2,110 jobs or 0.4 percent of total state employment.

The impact of the aluminum industry on the Montana economy was significant, but its relative impact on Flathead County was much greater:

- With 610 employees earning $28.7 million in labor income (including non-wage benefits), Columbia Falls supported a total of 1,980 jobs in the county, according to the Flathead County economic base model. The company accounted for 4.3 percent of the employment in the county. The personal income impact was estimated at $65.5 million or 4.3 percent of county income.

- The aluminum industry in Flathead County generated $6.2 million in state and local taxes, most of which came from personal and corporate property taxes. The aluminum industry and its employees directly accounted for $3.2 million in taxes. Overall, the aluminum industry constituted 5.3 percent of the Flathead County tax base.

The aluminum industry plays several roles in our economy. Foremost, it is a producer of a strong and light-weight material that is used in thousands of products. In the State of Montana, the industry is also a major provider of high-paying jobs.

THE MONTANA STATE ALUMINUM INDUSTRY ECONOMIC IMPACT STUDY

1. INTRODUCTION

The aluminum industry has been a fixture in the Pacific Northwest economy for the past sixty years. The purpose of this study is to estimate the economic importance of the aluminum industry to Flathead County in the State of Montana, which has one of the region's major aluminum plants.

The study draws upon an economic base model built specifically for this study. This model has the ability of measuring the impact of changes in one industry, such as the aluminum industry, on the rest of the county economy.

The rest of the report is divided into three parts. Section 2 describes the aluminum industry, highlighting its history and current operations. Section 3, which is the centerpiece of the study, presents estimates of the aluminum industry's economic impact on Flathead County. The impacts are measured primarily in terms of employment, income, and taxes. The report closes in Section 4 with a concluding remark.

2. THE ALUMINUM INDUSTRY

History

The hydroelectric potential of the Columbia River remained untapped until the 1930s, when the federal government financed dam building as one way to alleviate the economic suffering caused by the Great Depression. The immediate aim of the projects was to provide badly needed jobs. In the resource-dependent Pacific Northwest, the unemployment rate had risen to 25 percent, the average income had fallen by 50 percent, and many timber companies and farmers had been forced into bankruptcy. In the long term, the Columbia River dams were built to provide flood control, allow navigation of the river, generate electricity for homes and factories, and supply water to irrigate the Columbia Basin.

On July 17, 1933, ground was broken in northeastern Washington for Grand Coulee Dam, the greatest construction project undertaken to that time. In 1941, when the dam was completed, it stood 550 feet high and measured 5,232 feet across. At the peak of construction, the project engaged 8,800 workers. Hundreds of other jobs sprung up in the half dozen small settlements near the dam, where the construction workers lived and spent their earnings.

The federal government encouraged aluminum companies to construct aluminum production facilities, which are very power intensive, in the Pacific Northwest to provide a use for the electricity produced at federal hydroelectric dams. The federal government's role in the building of aluminum plants continued into the 1940s and 1950s.

In 1940, the United States was on the brink of entering World War II and needing all the power it could muster to support military-related industries. In the Pacific Northwest, manufacturers were called upon to produce food, clothing, lumber, metals, machinery, ships, and aircraft for the war.

For example, in 1944, at the height of the war, Boeing employed 50,000 people and rolled out sixteen B-17s and six B-29s each day.

Aluminum, which was light-weight, strong, and dissipated heat quickly, was a critical war material, especially for aircraft. At the outset of World War II, the Pacific Northwest had two aluminum reduction plants, both in Washington: the Aluminum Company of America plant in Vancouver and the Reynolds Metals Company plant in Longview.[1] As the war effort built up, the federal government constructed additional smelters in Spokane, Tacoma, and Troutdale, Oregon, all of which were operated by Alcoa. To meet the electricity requirements of these plants Congress appropriated $2 billion for a six-fold increase in the generating capacity of the Columbia River dams between 1941 and 1945. At the end of the war, the federal government sold the Troutdale smelter to Reynolds and the Spokane and Tacoma smelters to Kaiser Aluminum & Chemical Corporation.

Boosted by the post-war economic boom, the domestic demand for aluminum rose rapidly. New products were developed for construction (e.g., aluminum siding), household uses (e.g., aluminum foil), and food and beverage packaging (e.g., TV dinners).

In the 1950s, the Korean War prompted a 70 percent increase in U.S. aluminum production capacity, resulting in construction of new facilities at Columbia Falls, Montana, Wenatchee, Washington, and The Dalles, Oregon. Additional smelters were built in the mid-1960s at Ferndale and Goldendale, Washington. At that point, the Pacific Northwest produced 40 percent of the nation's primary aluminum and the regional aluminum industry, as we know it today, was more or less in place.

The road for the aluminum industry since that time has not been smooth. Cyclical downturns in the industry, a slowdown in long-term demand because of competing materials (e.g., vinyl for siding and plastics for packaging), and the construction of dozens of aluminum smelters around the world at locations with low power costs have threatened the survival of more than one Pacific Northwest plant. Perhaps most problematic for the local aluminum industry has been the rising cost of electricity. In fact, at the time of this report, Kaiser and Vanalco have temporarily curtailed production in response to high market prices for power.

Current Operations

Essentially two facts explain the presence of the aluminum industry in the Pacific Northwest. First, the Columbia River, which winds its way through the region, embodies 40 percent of the nation's capacity for hydroelectric energy, the country's cheapest source of power. Second, 6-8 kilowatt-hours of electricity are required to produce one pound of aluminum ingot, the basic material for aluminum products. Thus, the supply of low-cost federal hydroelectric power in the state and the encouragement of the federal government have been a draw to aluminum companies for the past sixty years.

The aluminum industry is a highly integrated operation. The products of one plant are often used as inputs to production in another plant. Of the primary aluminum produced in the Pacific Northwest, one-fifth is sold to aluminum fabricating plants in the region, where it is manufactured into sheet and plate. These semi-finished products, which are ultimately used in

[1] Alcoa and Reynolds completed a merger in May 2000. Alcoa now owns Reynolds' Longview and Troutdale plants, but under the merger agreement it must sell a minority portion of the Longview facility.

airplanes, automobiles, packaging, and construction materials, are then sold throughout the world.

In 1998, the Pacific Northwest aluminum industry sold more than $3 billion worth of products and employed about 10,000 people in Oregon, Washington, and Montana, according to industry data. The aluminum industry in Montana engaged 620 workers (Table 1). The Columbia Falls Aluminum Company accounted for virtually all of the industry's total employment in the state.

Table 1

MONTANA STATE ALUMINUM INDUSTRY EMPLOYMENT AND WAGES AND SALARIES, 1998

Employment	620
Columbia Falls Aluminum Company	610
Other	10
Wages and salaries* (mils. $)	24.4
Average wage and salary* ($)	39,620
Average Montana State wage and salary* ($)	22,430

*Excludes non-wage benefits.

Aluminum industry employees in Montana earned $24.4 million in wages and salaries (excluding non-wage benefits) in 1998. The average wage and salary was $39,620 per year, approximately 1.8 times the state average. Including non-wage benefits, labor income totaled $28.9 million. With an average labor income of $47,070 per year, aluminum industry employees were among the best paid workers in the state.

3. COUNTY IMPACT

Note on Methodology

The ability of a region (e.g., a state or county) to export is a key determinant of its economic health. In the context of the Montana economy, exports are broadly defined to include sales of locally produced goods and services to foreign markets and customers in the rest of the United States (including the federal government). Without export activity, the regional economy would be small, inefficient, and poor. Since the lack of export income would preclude the purchase of imports, consumers would have access only to goods and services that could be produced within the region. For those products that were provided locally, markets would be of limited size and producers would be unable to take advantage of the efficiencies that accompany specialization and large-scale production. As a consequence, regional per capita income would be low and few people would choose to live and work in the region.

Of course, Montana is far from a self-contained economy. Exports of aluminum, agricultural commodities and processed food, logs and lumber, pulp and paper, and professional services provide income that has led to a sizable, broad-based, and complex economy. Even the jobs of the grocery clerk, the carpenter, and school teacher depend upon export activity, although the links are not always apparent. Without the income from exports, there would be a smaller demand for groceries; without export-producing employees and their families, there would be less need for housing; and without the children of these families, there would be fewer schools.

As a major exporting industry, the aluminum industry not only manufactures aluminum for hundreds of products, ranging from airplanes to cans, but it also plays a significant role in the Montana economy. The industry's employment impact extends well beyond the 620 people working in it, since its payroll and other operating expenditures create job opportunities in other businesses through the so-called multiplier (respending) process.

The Flathead County impact analysis is conducted with an economic base model constructed specifically for this study. It should be pointed out that due to a paucity of data the county model is relatively simple and contains a limited number of variables (principally, employment, income, population, and taxes). Nevertheless, the model provides a reasonable estimate of the local economic impact of the aluminum industry.

Economic Impact

The impact of the aluminum industry on the State of Montana economy stems from its employment and labor income as well as its expenditures for goods and services that are produced in the state. Previous studies indicate that the Montana aluminum industry's employment multiplier is about 3.4. This means that each aluminum employee indirectly supports 2.4 other jobs in the state economy. Since the aluminum industry employed 620 workers in 1998, its total impact on the Montana economy amounted to approximately 2,110 jobs (wage and salary employees and proprietors). This represented 0.4 percent of total state employment in 1998. Most of the jobs indirectly supported by the aluminum industry were in nonmanufacturing (wholesale and retail trade and services) and government.

The economic impact of the aluminum industry on Montana was significant, but its relative impact on Flathead County, the home of Columbia Falls Aluminum Company, was much greater, as shown in Table 2. [2] Note that the county employment impact does not sum to the state impact. There are two reasons for this. First, the county impact pertains only to the Columbia Falls plant. Second, the impact of an aluminum plant located in one county tends to spill over into other counties.

With 610 employees earning $28.7 million in labor income (wages, salaries, and non-wage benefits), Columbia Falls supported a total of 1,980 jobs in the county in 1998, according to the Flathead County economic base model. The implicit employment multiplier was 3.2 (=1,980/610). As in the case of the state economic impact, the greatest number of jobs supported by the aluminum company and its employees were found in wholesale and retail trade (310),

[2]Economic data describing each of the counties in 1998 can be found in Appendix B.

Table 2

ALUMINUM INDUSTRY IMPACT ON THE FLATHEAD COUNTY ECONOMY, 1998

	Flathead County
DIRECT IMPACT	
Employment	610
Labor income (mils. $)	28.7
TOTAL IMPACT	
Employment	1,980
Proprietors	400
Wage and salary employment	1,580
Resources	0
Manufacturing	620
Primary metals	610
Other manufacturing	10
Nonmanufacturing	820
Construction	30
Transportation and public utilities	60
Wholesale and retail trade	310
Finance, insurance, and real estate	60
Services	360
Government	140
Personal income (mils. $)	65.5
Per capita income ($)	35
Population	2,970
State and local taxes (mils. $)	6.2
PERCENT OF COUNTY TOTAL	
Employment	4.3
Proprietors	3.1
Wage and salary employment	4.8
Personal income (mils. $)	4.3
Per capita income ($)	0.2
Population	4.1
State and local taxes (mils. $)	5.3

services (360), and government (140). The Columbia Falls plant accounted for 4.3 percent of total county employment. The personal income impact was an estimated $65.5 million or 4.3 percent of county income. Aluminum operations raised county per capita income by $35.

In Flathead County, the aluminum industry generated $6.2 million in state and local taxes. These included income and property taxes paid to state and local governments. Three-fifths of the tax revenue came from personal and corporate property taxes. The aluminum industry and its employees paid $3.2 million in state and local taxes. The remaining taxes resulted from the indirect impact of the aluminum companies and their employees on other businesses and households in the county. Overall, the aluminum industry constituted 5.3 percent of the Flathead County tax base.

4. CONCLUSION

The aluminum industry plays serveral roles in our economy. Foremost, it is a producer of a strong and light-weight material that is used in thousands of products, including airplanes, automobiles, and packaging.

In the State of Montana, the industry is also a provider of nearly two thousand high-wage jobs, most of which are found in Flathead County. When the first Pacific Northwest aluminum plant opened sixty years ago, it helped pull the region out of the Great Depression. Since then it has been a fixture in the regional and Montana economies, despite rising energy costs and growing competition overseas.

Appendix A

TECHNICAL NOTES

TECHNICAL NOTES

A-1. DEFINITIONS AND CONVENTIONS

Employment

Adopting the concept used by the U.S. Bureau of Economic Analysis, employment is the annual average number of full and part-time wage and salary employees and self-employed workers (proprietors). In a given year, total employment is greater than the total number of persons employed, as measured by the U.S. Bureau of Labor Statistics, because of workers holding more than one job.

Personal Income

The components of personal income are labor income, property income (dividends, interest, and rent), transfer payments, contributions to social insurance, and the residence adjustment. Labor income includes wages, salaries, proprietors' income, and other labor income earned by job-holders working in the state or county. Note that labor income is measured by place of work, whereas personal income is measured by place of residence. The adjustment for residence, which may be positive or negative, takes into account the income of people who work in one state or county but live in another. Personal income is valued in 1998 dollars. Following standard conventions, the U.S. implicit price deflator for personal consumption expenditures (1998=1.000) is used to convert current-dollar personal income estimates into 1998 dollars.

A-2. IMPACT ANALYSIS METHODOLOGY

County Impact

The only major aluminum plant in Montana State is located in Flathead County. Estimating the economic impact of the aluminum industry on the county is basically a three-step procedure:

1. Estimate the direct employment and income impacts on the county.

2. Using an economic base model of the county, estimate the aluminum industry's indirect employment and income impacts.

3. Given the estimate of the total employment impact, estimate the population impact.

The county economic base model identifies fourteen employment categories, including nine major sectors: resources (agriculture, forestry, fishing, and mining); primary metals; other manufacturing; construction; transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; services; and government.

The economic base model is specified in terms of income. Thus, following standard procedures for building economic base models, a single income multiplier is estimated for the county. This multiplier, combined with the estimate of the aluminum industry's labor income (after deducting the income of aluminum workers who live outside the county), leads to an estimate of the county's total personal income impact. Employment-income ratios (i.e., the number of nonbasic

jobs in wholesale and retail trade, for example, supported per dollar of personal income in the county) are then used to estimate the indirect employment impact.

The size of the aluminum industry's impact on a county essentially depends upon three things: (1) the size of the aluminum facility (the number of workers and the amount of payroll); (2) the percent of county jobs held by people who live in the county; and (3) the degree to which the county economy is self-sufficient. The first factor determines the size of the direct impact of the aluminum industry on the county, while the next two factors determine the size of the aluminum industry's multiplier.

Since the economic base model is a relatively simple model, at least compared to other models, such as an interindustry econometric model, it is subject to appreciable measurement error. Nevertheless, the results obtained from the economic base model constructed for this study constitutes reasonable estimates of the aluminum industry's impact on Flathead County.

Employment Multiplier

Employment multipliers are one means of standardizing the measurements of economic impacts for purposes of comparison. The employment multiplier for an industry is defined as the ratio of its total employment impact to its direct employment impact. In 1998, for example, the aluminum industry employed 610 jobs (rounded to the nearest ten) in Flathead County and indirectly supported 1,370 jobs in other Flathead County industries, according to estimates with the county economic base model. In this case, the aluminum industry's county employment multiplier is 3.2 (=[610+1,370]/610=1,980/610). The multiplier can be interpreted to mean that, on average, each aluminum industry job indirectly supports 2.2 other jobs in the county economy. The aluminum industry's wage and salary employment multiplier, which excludes proprietors, is 2.6 (=1,580/610).

Tax Impact

The state and local tax impact is also estimated for Flathead County.

There are three steps to the analysis:

1. Estimate the taxes paid by the aluminum industry.

2. Estimate the taxes paid by the aluminum industry employees.

3. Estimate the taxes paid by all businesses and employees indirectly supported by the aluminum industry.

Two types of taxes are estimated: income taxes, both personal and corporate, and property taxes. Taxes paid by the aluminum industry are estimated from a survey of the Columbia Falls Aluminum Company. Taxes paid by aluminum industry employees and other businesses and employees indirectly supported by the aluminum industry are estimated by multiplying various tax coefficients (e.g., the income tax-personal income ratio) by the relevant economic impact (e.g., the personal income of the aluminum industry employees).

A-3. ALUMINUM INDUSTRY DATA

The direct economic impact of the aluminum industry on Flathead County is the industry's employment, labor income, and taxes. Information on these variables for 1998, the year of the impact analysis, was provided by the Columbia Falls Aluminum Company. The information obtained from the aluminum company was cross-checked and supplemented with data from the Montana Department of Labor and Industry (2000) and the U.S. Bureau of Economic Analysis (1999).

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Appendix B

ECONOMIC CHARACTERISTICS OF MONTANA STATE AND FLATHEAD COUNTY, 1998

Table B-1

ECONOMIC CHARACTERISTICS OF MONTANA STATE AND FLATHEAD COUNTY, 1998

	Montana State	Flathead County
Civilian labor force	467,820	38,450
Persons employed	441,540	35,400
Persons unemployed	26,280	3,050
Unemployment rate (%)	5.6	7.9
Employment	543,330	46,300
Proprietors	141,730	13,540
Wage and salary employees	401,600	32,760
Resources	11,890	370
Manufacturing	24,520	4,350
Primary metals	1,050	700
Other manufacturing	23,470	3,650
Nonmanufacturing	282,210	23,500
Construction	19,910	1,900
Transportation and public utilities	22,050	1,370
Wholesale and retail trade	103,020	8,520
Finance, insurance, and real estate	17,640	1,480
Services	119,590	10,230
Government	82,980	4,540
State and local government	61,860	3,300
Federal government, civilian	12,650	830
Federal government, military	8,470	410
Personal income (mils. $)	17,826.8	1,524.2
Labor income	11,730.1	1,030.8
Property income	3,457.8	308.7
Transfer payments	3,639.4	284.0
Contributions to social insurance (-)	971.7	88.5
Residence adjustment	-28.8	-10.8
Per capita income ($)	20,247	21,219
Population	880,450	71,830