SOUTHEAST CONFERENCE

REGIONAL MANAGEMENT OPTIONS FOR SELECTED MUNICIPAL SOLID WASTE STREAMS

FINAL REPORT

Prepared for:

Southeast Conference Solid Waste Management Committee

Prepared by:

Ross & Associates

in association with

R.W. Beck and Associates

Prepared under a grant provided by the Alaska Department of Environmental Conservation
with matching resources from Southeast Alaska communities and the Alaska Marine Highway System

September, 1991

SOUTHEAST CONFERENCE

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September 24, 1991

Dick Griffin, President
Southeast Conference
124 West 5th Street
Juneau, Alaska 99801

Dear Dick:

It is with great pleasure and pride that I submit a copy of "Regional Management Options for Selected Municipal Solid Waste Streams", the final report of the Southeast Conference's investigation of Southeast Alaska's ability to enter the world recycling market and to improve the management of used oil and household hazardous wastes. The report documents the process and progress of the Southeast Conference's Solid Waste Management Committee in characterizing the current waste management situation in Southeast Alaska; outlines the factors which will influence positive changes to that situation; and develops recommendations which can make improved waste management practices a reality. The project was a collaborative effort of 14 communities in Southeast Alaska and would not have been possible without the generous support of both financial resources and personal involvement from these communities.

As you will see in your review of the final report, the project generated significant valuable information on how these selected waste management alternatives might operate and be improved in Southeast Alaska. I would like to highlight the report's major findings, and to provide the Committee's recommendations on the possible next steps for the Southeast Conference to consider at the upcoming annual meeting.

- There do appear to be opportunities for the recycling of certain waste streams in Southeast Alaska. For some of these waste streams (e.g., aluminum, office paper), communities will need to develop their own individual recycling programs. Recycling of other waste streams (e.g., scrap metal) may benefit from joint efforts on the part of several communities to be most feasible.

  The Committee believes that communities should continue to work together and share information about recycling collection alternatives over the next year as each community decides how much, if any, recycling it might choose to implement both individually and collectively.

- A number of alternatives exist that could provide improved household hazardous waste management in Southeast Alaska. In particular, three specific management alternatives were identified in our study. However, each of these alternatives represents a cost greater than what is currently being spent in Southeast.

The Committee believes that the need to improve the management of household hazardous waste is sufficiently important to further explore these alternatives and to begin a serious dialogue with the Alaska Department of Environmental Conservation and the Alaska State Legislature on how to best raise the additional funding these alternatives would require.

- While the existing "ad hoc" management of used oil in Southeast Alaska appears to serve many communities' needs, other options exist for a more systematic regional approach to used oil management. In particular, as a result of the study, an Agreement In Principle has been developed between the Alaska Marine Highway System, Ketchikan Shipyard, Inc., Ketchikan Pulp Company, the City of Ketchikan, the Alaska Department of Environmental Conservation, and the Southeast Conference, on a system to provide for the in-region collection and burning of used oil. However, more work remains among the parties to establish the precise ways in which this system would operate.

  The Committee believes that this Agreement In Principle represents an important option for Southeast communities and believes the Southeast Conference should continue to facilitate discussions between the parties and to work with communities to access this option.

The Committee is excited about the prospects of implementing some or all of these options. We believe that next year could be extremely productive in setting Southeast Alaska on a course for improved solid waste management, and we encourage the Southeast Conference to continue to help to make this happen.

Again, the project would not have been possible without the commitment and dedication of the Committee members and the generous financial support from the communities, the Alaska Marine Highway System and the Alaska Department of Environmental Conservation.

I look forward to a fruitful discussion of the project and the future of solid waste management in Southeast Alaska at the annual meeting.

Sincerely,

Stuart Denslow
Chairman, Solid Waste Management Committee

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ACKNOWLEDGEMENTS

This project would not have been possible without the valuable resources provided by the Alaska Department of Environmental Conservation, the participating Southeast Alaska communities, and the Alaska Marine Highway System. In particular, the Alaska Department of Environmental Conservation provided seed money in the form of a grant to the Southeast Conference for the project. Two kinds of matching resources were provided by communities and the Alaska Marine Highway System. The communities of Haines, Sitka, Wrangell, and Ketchikan and the Alaska Marine Highway System provided cash contributions to support the project. In addition, in-kind contributions were provided by both these participants and Craig, Juneau, Petersburg, and Skagway.

REGIONAL MANAGEMENT OPTIONS FOR SELECTED MUNICIPAL SOLID WASTE STREAMS

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EXECUTIVE SUMMARY

Solid waste management is becoming an increasingly complex task for Southeast Alaska communities. Growing recognition exists that managing solid waste is no longer simply a process of collection and disposal, but ideally requires the management of a diverse set of tasks including collecting and marketing of recyclable materials and segregating "special" wastes, such as household hazardous waste, from the generic solid waste stream. Southeast Alaska communities have been working over the past several years - primarily on an individual basis - to improve their solid waste management. Communities are searching for economically affordable ways to implement an integrated and environmentally sound set of waste management practices.

In late 1990, Southeast Alaska communities asked the Southeast Conference to explore ways in which cooperative efforts among communities could bring about desired changes in their management of solid waste. Their premise was that cooperative efforts may enable communities to offer management services at a lower cost than if each tried to provide them independently. Of particular interest to the communities were recyclable and special waste streams, because these present opportunities to implement the state's hierarchy of preferred solid waste management alternatives.

Guided by the Southeast Conference's Solid Waste Management Committee (comprised of representatives of fourteen communities), and with financial support from communities, the Alaska Marine Highway System, and the Alaska Department of Environmental Conservation, the Southeast Conference has investigated regional approaches to the management of a series of selected waste streams. The project has focused on three areas: traditional recyclable waste streams (e.g., aluminum, paper) and two special waste streams of particular concern to the communities: used oil and household hazardous waste. For each area, the project identified and assessed regional management options for waste management and identified the next steps necessary to make improved waste management a reality.

The major findings and recommendations of the project in each of the three focus areas - recyclable wastes, used oil, and household hazardous waste - are highlighted below.

A. RECYCLABLE MATERIALS

The ability of Southeast Alaska to recycle solid waste, such as cardboard, auto batteries, and scrap metal, is heavily influenced by two factors: the cost of transporting materials from dockside in each community to the buyers of these materials; and the price which these materials can command in the world market. The project determined the net profit/loss value that would result from the transport and sale of eight different recyclable materials. In addition, the project investigated opportunities for increasing revenue and decreasing transportation costs by coordinating community efforts within the Region.

Findings:

The balance between transportation costs and revenues depends on the type of recyclable material. Revenues less shipping costs for recyclable materials range between a net loss of approximately -$300 per ton and a net gain of approximately $700 per ton. For some recyclable materials, the revenue per unit offered by buyers more than offsets the costs of transportation. For other materials, transportation costs more than offset any revenue received. Within the historic range of commodity prices and transportation costs, the following materials would tend to have net economic gain - in terms of transportation versus sales - for most communities: aluminum, office paper, and auto batteries. The following materials would fluctuate between a slight gain and a slight loss: auto bodies, cardboard, and scrap metal. The following materials would result in a net loss for Southeast Alaska communities: white goods and tires.

Collective marketing efforts by the Region are not likely to yield higher revenues for recyclables. Guaranteeing a larger volume of recyclables to buyers, through coordinating the shipment and marketing of all communities' recyclables, will generally not result in higher revenues being obtained per unit of material. The amount of revenue offered per unit is primarily dependent on daily market fluctuations and on the quality of the material delivered. Buyers will offer a small amount of additional revenue on the basis of quantity: more revenue is offered for a full container load of materials rather than a less than full container load. However, due to the costs of interport transportation, each community is best served by working on its own to ship a full container load to the market, rather than working together as a region.

Lower transportation rates for recyclables may be possible for the Region to obtain. Alaska Marine Lines has stated that it may be possible for the Region to obtain price reductions on recyclables shipped south during off-season (October through February). The Alaska Marine Highway System has stated that it will work with communities to determine the most cost-effective way to transport their recyclables. Precise price reductions and/or transportation planning assistance would need to be arranged between the Region and transportation vendors. Given the generally high costs of transportation, a potential discount from transportation vendors may not be large relative to baseline costs. Transportation, therefore, is likely to continue to be an important factor in evaluating Southeast's ability to recycle solid waste.

Creative regional options exist which might make recycling of selected waste streams more feasible. Communities will probably experience an economic loss from the conventional transport and sale of tires and white goods out of the region. In-region uses of these materials or unique approaches to out-of-region management may make recycling of these waste streams more feasible. For waste tires, the use of tire derived fuel as a supplemental fuel source in one of the region's two pulp and paper mills appears to be the most promising option. One vendor has expressed interest in working with communities to process their used tires into tire derived fuel in exchange for developing new markets for its products. For white goods - as well as other forms of scrap metal (e.g., auto bodies) - a dedicated barge which would routinely collect scrap metal from Southeast may improve the economics of scrap metal recycling. Three transportation vendors have expressed

interest in such a venture.

Recommendations:

The next step for each community is to use this information in its consideration of how much recycling it wants to provide for its own residents. To make a final determination, the following is recommended:

Assess further the true cost of a recycling program in each community that is interested in providing recycling services. The costs of collecting materials for recycling within each community is a significant cost and was outside the scope of this analysis. The economic benefit of avoided land disposal costs should also be included in this analysis. Communities should work together to develop and share this information.

Decide on the amount and type of recycling which will be conducted within each community. Many different types of recycling programs can be implemented by a community. Communities must decide, based on cost as well as other factors (e.g., public interest), which types and amount of materials they will collect and which type of program can best accomplish this.

Decide whether to work with other communities to recycle selected waste streams. Several of the waste streams examined - scrap metal, white goods, auto bodies, and tires - may be most cost-effectively managed as a region. Communities must decide whether to pursue any of the potential regional options identified by this project.

B. USED OIL

Used oil, and its proper management, is a waste management challenge facing all Southeast Alaskan communities. The project identified the major volumes of used oil generated in Southeast Alaska and the major management options currently being used to recycle, burn, or otherwise dispose of this used oil. The project also initiated the development of an additional used oil management alternative which, if implemented, would significantly improve used oil management in Southeast Alaska.

Findings:

Approximately 500,000 gallons of used oil is currently managed in Southeast Alaska. This volume is generated by a variety of sources and managed through a variety of means. Used oil is generated by a wide variety of sources including auto and boat owners, power companies, pulp mills, and the Alaska Marine Highway System. The set of management options used by Southeast Alaska is also diverse, ranging from burning it for fuel at the site where it is generated to shipment of the used oil to Seattle for recycling or disposal.

The existing management of used oil in Southeast is "ad hoc" in nature, and is therefore not as reliable, economic, or comprehensive as it could be. Most communities have a collection

system in place for used oil that appears at the present time to generally meet their needs. However, in many communities the existing systems do not serve all generators and collectors as well as is necessary to ensure economical and reliable management. In addition, because they are ad hoc in nature and have no established backup system, these systems are potentially subject to severe disruption in the event of changing markets, regulations, or disposal options.

The development of an additional used oil management alternative available to all communities in the region would be beneficial. If a management alternative is put into place that can be accessed by communities as their needs change or grow, communities are more likely to be able to ensure the safe, legal, and environmentally sound management of used oil.

The project has initiated the development of a backup used oil alternative for the Region via an Agreement In Principle among several parties. The alternative generally entails collection of used oil and oily water from Southeast Alaska communities and the Alaska Marine Highway System, processing of oily water at the Ketchikan Shipyard, Inc. to convert it to oil suitable for burning as fuel, and ultimate disposal of the used oil via burning for energy recovery at the Ketchikan Pulp Company. This alternative would supplement those disposal methods already in place in Southeast Alaska communities.

Recommendations:

Southeast communities should work with the Southeast Conference to implement the Agreement In Principle. Communities and the Southeast Conference need to continue discussions with other parties to the Agreement on the precise ways in which the Agreement In Principle would operate. This will include investigating: 1) the responsibilities of the communities and the Alaska Marine Highway System for accessing this alternative, including collection, testing, shipping, and storage; 2) how used oil will be transported; and 3) the cost of the alternative, which signatories have agreed will be "fair and reasonable" given that safe oil management is in the public interest.

Communities should systematically consider their immediate and longer-term needs for used oil management. By developing a clearer sense of their current and future used oil generation rates and management capacity, communities will be better able to evaluate their needs vis-a-vis the Agreement In Principle as well as any current management system they might have.

C. HOUSEHOLD HAZARDOUS WASTE

Southeast Alaska communities would like to improve the collection and management of household hazardous waste (HHW). The project investigated how improved collection and disposal of household hazardous waste might best be accomplished, through the development and comparison of three specific options.

Findings:

A range of management options are available to Southeast Alaska communities to improve their management of HHW. The project compared three major alternatives: increased regularly scheduled collection days purchased from contractors (such as those now held periodically in some of the larger communities) in more communities in Southeast; operation of a mobile collection system within Southeast Alaska that would visit communities routinely and ship waste collected out from each community; and the development of depots in the larger communities which would enable citizens to deposit waste regularly for shipment whenever collection volumes justified it, combined with regularly scheduled collection days in the smaller communities.

Each of the options differ on factors such as capital and operating costs, number of collection days provided, and amount of waste collected. Each of the options has different advantages and disadvantages associated with them. For example, the depot option would provide the most days of actual collection, but it also involves the greatest capital investment. The collection day option, in contrast, requires no capital investment, but would likely collect the least amount of waste of all three options. The mobile collection system would require a smaller capital investment than the depot option, but would not collect as much waste.

Each option would cost more than is currently being spent on HHW in Southeast. Although each option has relative benefits and disadvantages, the project did determine that improved household hazardous waste management could become a reality for Southeast Alaska, but at a cost greater than that currently being spent in Southeast.

Recommendations:

Communities should begin a serious dialogue with ADEC and the Alaska State legislature on how to raise funding for a more comprehensive HHW program. Although several funding options exist for improved management of HHW - including state general funds, user fees, and surcharges on residential garbage bills - any of these will require and/or benefit from discussions with the State legislature and ADEC.

D. CONCLUSION

Opportunities do exist for the communities in Southeast Alaska to improve the management of their solid waste. In particular, the Southeast Conference has identified a series of concrete options available to communities to improve the management of three specific waste streams: recyclables, used oil, and household hazardous waste. The options identified for these waste streams include both efforts available to individual communities (e.g., establishing a community recycling program for aluminum, office paper, and/or other materials), as well as efforts available to communities working jointly (e.g., developing a regional household hazardous waste management program, scrap metal collection, waste tire management, and used oil management).

It is now up to the communities in Southeast Alaska to take the next step in exploring these options more closely, including performing more specific program planning and determining funding sources. In addition, it is important for the communities to maintain a dialogue with each other as this process unfolds. These efforts should set Southeast Alaska on a course for significantly improving its solid waste management.

INTRODUCTION

STRUCTURE OF THE PROJECT

This project was guided by the Southeast Conference Solid Waste Management Committee. The Committee is comprised of representatives from the eight largest communities in Southeast Alaska: Craig, Haines, Juneau, Ketchikan, Petersburg, Sitka, Skagway, and Wrangell. Several smaller communities also became involved over the course of the project, including Hoonah, Klawock, Metlakatla, Tenakee Springs, and Yakutat. In addition to these communities the Alaska Marine Highway System, a major generator of certain waste streams, was also an active participant in the project.

Under the guidance of the participants, the project's analysis was conducted by Ross & Associates, with the assistance of R.W. Beck and Associates. The contractors undertook a variety of analytical tasks in each of the project's three topic areas - recyclable materials, used oil, and household hazardous waste. These tasks included reviewing background documents; conducting telephone interviews; and in-person discussions with representatives of relevant businesses and agencies. Specific tasks ranged from direct data gathering (e.g., gathering information about the quantity of used oil generated in Southeast Alaska) to conceptualizing management solutions (e.g., developing three program options for improved household hazardous waste management). Regular project meetings were held between the Committee and the consultant team to set the project direction, and to review and approve the analysis and findings. The results of these activities have culminated in this report.

ORGANIZATION OF THE REPORT

This study is organized as a series of independent reports in each of the three main topic areas: recyclables; household hazardous waste; and used oil. Attached to each report are appendices containing information used to support the analysis of the topic area. Each report provides an initial scoping analysis of options for improved waste management and identifies the steps necessary to further investigate or implement those options.

RECYCLABLE MATERIALS REPORT

I. INTRODUCTION

A great deal of interest exists on the part of municipal governments and residents of Southeast Alaska to increase the recycling of solid waste. Recycling can provide many benefits: it diverts waste from landfills and incinerators, which preserves valuable waste disposal capacity; it reduces potential risks to human health and the environment that can result from the disposal of solid waste; it conserves natural resources; and may in some cases yield revenue from the sale of recyclable materials.

While recycling provides these benefits, the costs associated with a recycling program are an obvious consideration in any municipality's decision to implement a recycling program. For Southeast Alaska, in particular, this decision is made even more difficult due to the high costs of transporting recyclable materials to world markets, which are primarily in the continental United States. Transportation costs will therefore represent a significant component of the costs associated with any recycling program in Southeast Alaska.

To enable Southeast communities to begin evaluating the economic impacts (both positive and negative) of recycling, the Southeast Conference Solid Waste Management Project has investigated two major questions:

- If each community transports and markets its recyclables independent of other communities, will the revenues obtained for the materials be greater than or less than the costs of transportation?

- If communities coordinate the transport and/or marketing of their recyclables, can higher revenues be obtained, or lower transportation costs incurred, for the materials?

Given the significance of transportation costs to any recycling program established in Southeast Alaska, these questions will provide communities with an analysis of the economic feasibility of recycling starting from dockside. To fully determine whether to implement a recycling program communities will also need to assess the costs of collecting and processing the recyclable materials within the community, the economic benefit of avoided disposal costs, and other community-specific factors such as the level of public interest in recycling and the need to conserve waste disposal capacity. Assessing these costs and considerations were beyond the scope of this analysis.

This report is divided into four sections. The first section briefly describes the methodology used to conduct the research. The second section describes the revenues and transportation costs associated with recycling by each community on an individual basis. The third section describes the advantages and disadvantages associated with communities coordinating the shipping and marketing of their recyclables. The fourth section identifies issues which must still be addressed by communities before a recycling program is implemented. Attached as an appendix to this report is detailed market and transportation cost information for eight recyclable materials, for each community.

II. METHODOLOGY

Revenue and transportation cost estimates of recyclables were compiled for the eight largest communities in Southeast Alaska: Craig, Haines, Juneau, Ketchikan, Petersburg, Sitka, Skagway, and Wrangell. The eight recyclable materials examined include aluminum, auto batteries, auto bodies, cardboard, office paper, scrap metal, tires, and white goods (i.e., appliances such as refrigerators). These materials were selected for analysis by the Southeast Conference Solid Waste Management Committee either because of their potential to cause environmental or management problems (e.g., they take up a lot of space in a landfill), or because they have a higher market value relative to other recyclable materials.[1]

To obtain information on revenues, buyers of recyclables in Vancouver, B.C., Bellingham, and Seattle were contacted.[2] To obtain information on transportation costs, the eight major barge lines serving the communities were contacted.[3] Once this information was obtained, high and low estimates of revenues were compared to the transportation cost estimates for each of the materials. Finally, to gather information on the potential advantages of coordinating shipment and/or sale collectively, additional discussions were held with buyers of recyclables and with transportation vendors.

III. RECYCLING BY EACH COMMUNITY ON AN INDIVIDUAL BASIS

This section begins by making some brief observations about the range of values associated with selling different recyclable materials, and about the range of costs to ship different materials. Information is then presented on the "net revenue" (i.e., the estimated revenue after transportation costs have been accounted for) associated with recyclable materials.[4]

OBSERVATIONS ABOUT REVENUES AND SHIPPING COSTS

Different Recyclable Materials Have Different Values. The revenue offered for recyclable materials ranges from $15 to $800 per ton, depending on the material. Aluminum, for

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[1] The Solid Waste Management Committee also selected household batteries, used oil, and household hazardous waste to be examined by the project. No buyer for household batteries was found, so this waste stream is not included in the analysis. The management of used oil and household hazardous waste is discussed in separate chapters of this report.

[2] For each material, between 2-11 buyers were contacted. The number of buyers contacted depended on the number of businesses in existence which buy the materials and on the degree to which prices offered by a buyer(s) were representative of the revenues offered by all buyers.

[3] The eight shipping companies are: Alaska Marine Lines, Boyer Barge, White Pass, Alaska Outport, Alaska Pacific Barge, Northland, Sampson, and Lynden Transport via the Alaska Marine Highway System.

[4] This estimate of net revenue assumes the recyclable material is at "dockside" and therefore does not include collection and disposal costs. These costs would need to be included for a full evaluation of cost-effectiveness.

example, is the most valuable material, with revenues approximately 400% to 800% higher than other materials. The least amount of revenue is generally offered for white goods. For two materials, auto bodies and tires, some recyclers charge a fee (rather than offer revenue) to take the materials.

The revenue offered for a given recyclable material can fluctuate daily. The revenue offered by buyers depends on the market demand for the material, as well as on the quality and quantity of the materials provided.

Different Recyclable Materials Have Different Shipping Costs. Shipping costs range from approximately $35 per ton to $650 per ton. Shipping costs depend on several factors: the shipping company used; the type of material shipped; the preparation of the material (e.g., loose or baled); and the community from which the materials are being transported.

In general, the greater number of tons of recyclables which can fit into a standard shipping container, the less expensive it is to ship the materials. For this reason, auto batteries, scrap metal, and paper products are the least expensive to ship, while white goods and tires are the most expensive materials to ship.

COMPARISON OF REVENUES AND TRANSPORTATION COSTS

Transportation costs and revenues must both be considered to determine the economic feasibility of marketing Southeast Alaska's recyclables. Identified below are observations about the "net value" (i.e., after subtracting out transportation costs) of recyclables.

Transportation costs can significantly affect the revenue from each waste stream. For some materials, transportation costs represent a moderate portion of the overall value of the material; for other materials, transportation costs will exceed the revenue offered for the material by a significant amount. Aluminum has the best transportation cost to revenue ratio; white goods the worst.

In some Southeast communities, revenues will exceed transportation costs for the majority of materials; in other communities only one or two materials will show positive net revenues. The number of materials on which a given community can realize a profit (after transportation costs) depends on: the transportation costs from that community; the markets which each community can access (e.g., some communities do not have shipping access to Vancouver, B.C. markets); and whether the revenue paid is at the low end or the high end of the revenue range offered by buyers.

The table on the following page shows the net revenue which can be obtained for each material by each community. Although the net revenue for any given material varies across the communities, the following generalizations can be made:

- Aluminum is the most valuable material in each community: the net revenue range across all communities for aluminum is $300 to $750 per ton.

SUMMARY OF REVENUE (PER TON) MINUS TRANSPORTATION COSTS (PER TON)
FOR RECYCLABLE MATERIALS IN
EIGHT COMMUNITIES IN SOUTHEAST ALASKA

RECYCLABLE MATERIAL	SOUTHEAST ALASKA COMMUNITY							
	Craig	Haines	Juneau	Ketchikan	Petersburg	Sitka	Skagway	Wrangell
1. Aluminum	$337 - $737	$313 - $713	$336 - $736	$342 - $742	$332 - $732	$313 - $713	$296 - $696	$338 - $738
2. Auto Batteries	$1 - $31	($21) - $9	($12) - $18	$11 - $41	($7) - $23	($7) - $23	($20) - $20	$10 - $40
3. Auto Bodies	($24) - $6	($55) - ($25)	($24) - $6	($19) - $11	($24) - $6	($32) - ($2)	($74) - ($44)	($22) - $8
4. Cardboard	($16) - $9	($40) - ($15)	$8 - $33	$3 - $28	($31) - ($6)	($39) - ($14)	($49) - ($24)	$2 - $27
5. Office Paper	$22 - $67	($2) - $43	$46 - $91	$41 - $86	$7 - $52	$0 - $45	($10) - $35	$40 - $85
6. Scrap Metal	($20) - $14	($42) - ($8)	($32) - $26	($10) - $26	($27) - $7	($27) - $7	($61) - ($2)	($27) - $8
7. Tires	($175) - ($91)	($302) - ($218)	($300) - ($216)	($175) - ($91)	($183) - ($100)	($301) - ($218)	($308) - ($224)	($183) - ($100)
8. White Goods	($125) - ($65)	($174) - ($114)	($137) - ($76)	($125) - ($65)	($137) - ($76)	($157) - ($97)	($175) - ($114)	($137) - ($71)

Parentheses ( ) indicate a negative value.

- Office paper is the next most valuable material; its net revenue range is -$10 to $91 per ton across communities. (Transportation costs will exceed revenues in Skagway and Haines).

- Auto batteries will yield the third highest net revenue in most communities. At the high end of the revenue range offered by buyers, revenues will exceed transportation costs for all communities ($9 to $40 per ton). At the low end of the revenue range, revenues will exceed transportation costs for only three communities: Craig, Ketchikan, and Wrangell.

- For auto bodies, cardboard, and scrap metal, at the high end of the net revenue range most communities will make a profit (up to $33 per ton). At the low end of the net revenue range, most communities will not (-$74 to $8 per ton).

- For white goods and tires, the transportation costs from any community will exceed the revenue offered for them (-$308 to -$71 per ton).

The total net revenues from recyclables depend on the quantity of materials in each community. The quantity of materials collected in each community will determine the total net revenue which each community can obtain for its recyclables. Sitka, for example, estimates that it could collect approximately 70 tons of aluminum from within the community, which would yield between $20,000 and $50,000 in revenue (after transportation costs).

Since most communities have not conducted an analysis of the actual composition of their solid waste stream, total revenues theoretically possible from recycling cannot be estimated. A waste stream analysis and estimates of amounts of materials to be recycled would be the next step for communities to take to determine the total revenues possible from the sale of recyclable materials.

IV. COORDINATED SHIPPING AND MARKETING OF RECYCLABLES BY COMMUNITIES

A recycling program will be most feasible for communities to implement if the total revenue which can be obtained from the sale of a community's recyclables is maximized. This section provides information on whether communities, by working together as a region, can increase the overall revenue associated with the sale of recyclables.

Two specific questions were investigated:

- If communities market their recyclables together, enabling them to deliver a larger volume of materials to the market, would buyers pay a higher revenue per ton for the materials?

- Under what conditions might lower transportation costs be incurred by the communities?

Each of these questions is discussed in turn below.

ASSESSMENT OF THE POTENTIAL TO INCREASE REVENUE OBTAINED FOR RECYCLABLES

The revenue offered for recyclables is pegged to daily market fluctuations, as well as to the quality and the quantity of the materials delivered to the buyer.[5] Of these three factors, the quantity of materials affects revenue the least.

The major point at which additional revenue is offered on the basis of quantity is for a full standard container load of materials versus a less than full container load of materials. Greater revenue is offered for a full container load primarily because the shipment will require less handling by the buyer. For example, one buyer stated that if he receives a less than full container load of recyclables, it has to be brought out to the plant, combined with additional recyclables to make up a full container load, and then sent to the end user. A full container load of materials, however, could be sent directly to the end user and would not have to be taken to the plant. The amount of additional revenue offered for full container loads differs across materials. For auto batteries, one buyer stated that an extra $20 per ton would be paid; a paper buyer stated that an additional $5-10 per ton would be paid for a full container load.

Given that higher revenue is generally offered for full container loads, communities should obviously attempt to sell only full container loads of materials. Due to the high costs of interport transportation, it is most cost-effective for each community to fill up a container load within the community, rather than aggregating materials from several communities into a single container. Furthermore, since buyers stated that there is no additional price break given for delivering multiple full container loads to them, it appears that joint marketing of recyclables by communities will not result in a higher per ton payment for the materials. For individual communities to maximize their revenue, full container loads of materials should be marketed and those recyclables should be of high quality.

ASSESSMENT OF THE POTENTIAL TO DECREASE TRANSPORTATION COSTS

Given the high cost of transporting recyclables from Southeast Alaska, any decrease in shipping costs would make recycling more feasible for a community. The Solid Waste Management Committee has investigated whether transportation vendors may be willing to

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[5] Recyclables are considered to be of high quality if they are free of dirt, other foreign contaminants, and otherwise prepared to specifications identified by the buyer.

offer special rates for recyclables under certain conditions, such as transporting recyclables off-season.

Discussions have been held with Alaska Marine Lines and the Alaska Marine Highway System. Alaska Marine Lines has stated that price reductions on recyclables going south during off-season (October through February) are possible. The Alaska Marine Highway System has stated that it is willing to assist communities with determining how to most cost-effectively ship their recyclables to markets. The precise price reductions which may be possible need to be negotiated between the communities and the transportation vendors.

Another option for communities to investigate is a free or subsidized backhaul by businesses within the community. Alaska Pulp Corporation, for example, provides free backhaul service on their barge for Sitka's recyclables.

Even if these options are available to communities, shipping costs are still likely to be significant. This is because free or subsidized backhaul may not be reliable or because special rates offered by transportation vendors may not provide a large discount relative to baseline costs. Communities, therefore, should continue to include transportation costs as an important factor in their planning of a recycling program.

V. IN-REGION USES AND SPECIAL MANAGEMENT OPTIONS FOR SELECTED RECYCLABLES

For some recyclables, transportation costs are significantly greater than the revenues paid for the materials. These materials include white goods and tires. The Southeast Conference Solid Waste Management Committee has investigated whether any in-region uses or special management options exist to make it economically more feasible to recycle these waste streams. This section explores two options which the committee, on a preliminary basis, believed might be feasible: dedication of a barge to collect white goods (as well as other scrap metal) from Southeast communities, and potential in-region uses for waste tires.

COLLECTION OF SCRAP METAL, WHITE GOODS, AND AUTO BODIES VIA DEDICATED BARGE

Many communities in Southeast Alaska have been segregating white goods, auto bodies, and other scrap metal from the rest of their municipal solid waste. In many instances, communities are stockpiling these materials because of the expense of transporting them to a recycler.

Several barge lines were contacted to ascertain whether a special collection of communities' scrap metal could be scheduled and, if so, whether the costs would be less expensive than the standard shipping rates for the materials. Three companies were identified that may be interested in collecting scrap metal on a periodic basis (Anderson Barge Lines based in Juneau, Stewart Trading based in Vancouver, B.C., and a Pacific Northwest corporation based in Seattle).

These three companies are in the process of assessing the feasibility and costs of a scrap metal collection operation. Each of the companies' proposals is likely to be somewhat different. For example, two of the three companies indicated that, if necessary, they would be able to prepare the scrap metal for shipment (e.g., flatten vehicles with an auto crusher supplied by the companies) in addition to shipping the materials. The other company would probably not be able to process the materials.

An additional alternative for communities to consider, which could work in conjunction with a scrap metal barge, is the shared purchase by communities of an auto crusher or other processing equipment. This would enable communities to prepare their scrap metal for shipment at a cheaper cost than if each purchased the processing equipment separately. Communities could then either ship their scrap metal separately to market or via a dedicated barge.

The next step is for communities to determine more specifically their needs with respect to scrap metal collection. Communities need to assess the following:

- the quantity of scrap metal currently on hand in the community;
- the frequency of pick-up which would be most desireable (e.g., annual or semi-annual);
- the location of the scrap metal and whether assistance is needed to move the scrap to dockside;
- the ability of the community to prepare the materials for shipment; and
- the price which the community is willing to pay to manage the waste stream.

In summary, it appears that the collection of scrap metal via a dedicated barge can be arranged. This would provide communities with an additional and potentially less expensive alternative for transporting and marketing their scrap metal, especially if significant amounts of scrap metal are currently stockpiled in the communities. The precise costs of, or revenue from, such an operation still need to be developed. Each community, and the region as a whole, now needs to determine what it wants to do with respect to scrap metal collection.

WASTE TIRE MANAGEMENT OPTIONS

The need to identify waste tire management options that are both environmentally safe and economically feasible is a growing concern for several reasons. Waste tires contribute to diminishing landfill capacity, tend to "float" to the surface and disturb landfill caps, harbor rodents and mosquitoes, and release hazardous by-products when openly burned. Following is a brief summary of major findings related to waste tire management. A more comprehensive review of current generation and management of waste tires in southeast Alaska, alternative management strategies, and regulatory trends is contained in an Appendix to this section.

Management Options

There are many ways to recycle or reuse tires but none that clearly meet the needs of southeast Alaska communities. The region's low tire volume, small population, high transportation and labor costs, and limited road system advise against the development of in-region waste tire processing capability. However, land disposal is likely to become an increasingly costly option as the region's landfills reach capacity. Currently, the use of tire derived fuel (TDF) in one of the region's two pulp and paper mills appears to be the most promising option.

Tire Derived Fuel Use in Pulp and Paper Mills

TDF is a valuable supplemental fuel in pulp and paper mill operations when competitively priced with other fuels. The economics of burning TDF must be such that mills will invest in the equipment modifications and environmental permits required. Furthermore, the potential adverse environmental impacts of burning TDF - including toxic and particulate air emissions - must be considered. The region's two paper mills, the Alaska Pulp Corporation in Sitka and the Ketchikan Pulp Company in Ketchikan, were contacted to determine whether they would be interested in burning TDF. Currently, this option does not appear to be economically feasible at the Ketchikan facility; however, the Sitka mill is largely equipped to burn TDF and is willing to explore the possibility of using it as a supplemental fuel.

Because pulp and paper mills cannot burn whole tires, waste tires must first be processed into TDF (tire chips). Given the quantity of tires required to justify investment in TDF manufacturing equipment, it is more cost-effective for communities to send their waste tires out of the region for processing. Waste Recovery, Inc. (WRI) in Portland, Oregon is a firm that produces TDF for use pulp and paper mills. WRI has indicated that it is willing to take tires at a reduced cost to the generator if it can also develop additional markets for its product. This proposal may need public review, because of potential concerns about the impacts of burning tires, and will require ADEC's approval and cooperation. Actual cost savings to southeast communities will depend on WRI's willingness to subsidize the cost of transporting the region's tires to Portland for processing. This in turn depends on the market value of TDF, the quantity of product the mill can use, the volume of waste tires generated, and the level of regional support and cooperation.

Other Tire Derived Products

Unfortunately, several technical, economic, and environmental factors make most other recycling methods less than optimal for the region. The most commonly used alternatives are as follows:

- Rubber products for boats and fishing gear can be made by cutting items out of flattened tire casings. This process is labor-intensive and uses only bias-ply tires; therefore, it provides a disposal solution for very few tires.

- Rubberized asphalt is one of the largest potential uses for waste tires but its manufacture is a complex, expensive process. High production costs and the small number of paved

roadways limit the potential for manufacturing and using rubberized asphalt in southeast Alaska.

• Light-weight subgrade roadbed material is a "low-tech" alternative that involves splitting or quartering tires and using the pieces in place of sand or gravel. This option has some merits but again its feasibility depends on the amount of roadway construction in the region.

Improving Current Landfill Techniques

Landfilling is still the primary disposal option, particularly in rural areas. At this time it may also be the least expensive option.

• Tire splitting or shredding prior to landfilling can help make tires easier to handle, reduce their volume by as much as 75 percent, and prevent them from rising to the surface. Equipment costs depend on the volume of tires processed and the size of shred produced.

• Tire stockpiling or monofilling are two low cost options that involve managing waste tires so that they can be recovered at some future time when recycling economics improve.

In conclusion, there currently are no simple, inexpensive methods for disposing of waste tires. It is also quite likely that some type of federal legislation will shortly be passed to strictly regulate waste tire disposal. This makes it even more important that southeast communities continue to develop alternative management strategies and identify ways to pay for the collection and disposal of the region's waste tires. Potential sources of funding for either local or state waste tire programs include fees collected from tire disposal, the sale of new tires, or vehicle registration or title transfers.

VI. CONCLUSION AND RECOMMENDATIONS

This report has presented information on three topics:

- the revenues and transportation costs associated with recycling by individual communities;
- the potential to increase revenues and decrease transportation costs by coordinating communities' shipping and marketing efforts; and
- special regional management options for scrap metal and tires.

Based on the information provided herein, it appears that communities can take specific actions, both on an individual basis and through working together as a region, to maximize the amount of total revenue received from (or minimize the costs of) communities' management of recyclables.

Three specific "next steps" suggested by the information presented here are the following:

- Assess the total revenues and/or costs associated with an in-community recycling program. Costs other than transportation which need to be considered are public education costs (to educate residents about the program) and collection and processing costs. To determine the total revenue possible from a recycling program, the total quantity of each material which could be recycled in the community should be estimated. Communities should work together to develop and share this information.

- Decide on the amount and type of recycling which will be conducted within each community. Once the total costs and revenues are estimated, it is likely that implementation of a recycling program will require funding. In this case, recycling would be a local service that is "purchased" similar to fire protection, sewer service, etc. The City and Borough of Sitka, which is in the process of implementing a comprehensive recycling program, has found that their program will cost money, despite the availability of free transportation. Nevertheless, Sitka has decided that a recycling program is desirable. Communities must determine whether factors other than cost make implementation of a local recycling program attractive and, if so, which types and amounts of materials they will collect.

- Determine whether communities should work together as a region to recycle selected waste streams. Several of the waste streams studied - scrap metal, white goods, auto bodies, and tires - may be most cost-effectively managed as a region. Communities must determine their needs to manage these waste streams and if desired, pursue further the options outlined herein (i.e., a dedicated scrap metal barge and in-region burning of waste tires). In addition, communities may want to approach shipping companies as a region to negotiate special transportation rates.

It is now up to the communities to decide whether to pursue further the various actions which have been outlined (e.g., a scrap metal barge, burning TDF at the Alaska Pulp Corporation). In order to make these decisions, each community should consider the recycling options in the context of its overall solid waste management plan. Communities must determine the degree to which the information presented here, when combined with community-specific factors such as public interest in recycling and the need to preserve landfill space, makes a recycling program feasible for the community.

RECYCLING APPENDICES

APPENDIX A: REVENUE AND TRANSPORTATION COST INFORMATION ON RECYCLABLES

- A1: Guide to Information Contained in Appendix A
- A2: Summary of Revenue and Transportation Costs for Eight Materials
- A3: Information on Shipping Recyclables
- A4: Information on Markets for Recyclable Materials

APPENDIX B: WASTE TIRE MANAGEMENT REPORT

A1: Guide to Information Contained in Appendix A

TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN EIGHT COMMUNITIES IN SOUTHEAST ALASKA

Transportation cost estimates and revenue estimates for eight recyclable materials were compiled for eight communities in Southeast Alaska: Craig, Haines, Juneau, Ketchikan, Petersburg, Sitka, Skagway, and Wrangell. The recyclable materials examined include aluminum, auto batteries, auto bodies, cardboard, office paper, scrap metal, tires, and white goods.[1]

Attached is a packet of information on the cost and revenue estimates compiled for each community. The packet is divided into three sections:

I. Summary Information: Transportation Costs and Revenues for Recyclable Materials

II. Information on Shipping Recyclable Materials

III. Information on Markets for Recyclable Materials

The following is a brief overview of each section.

I. SUMMARY INFORMATION: TRANSPORTATION COSTS AND REVENUES FOR RECYCLABLE MATERIALS

This section provides a summary of the "net cost per ton" (i.e. the revenue per ton received from the sale of a recyclable material, minus the cost per ton to transport the material to a buyer) for eight recyclable materials.

The section is comprised of two spreadsheets: Spreadsheet 1: Transportation Cost Estimates and Revenue Estimates for Recyclable Materials; and Spreadsheet 2: Summary of Revenue (Per Ton) Minus Transportation Costs (Per Ton) for Recyclable Materials in Eight Communities in Southeast Alaska. This section also includes a list of assumptions used to compile the shipping cost estimates.

A. Spreadsheet 1: Transportation Cost Estimates and Revenue Estimates for Recyclable Materials

This spreadsheet provides per ton shipping cost and revenue estimates for a given community in Southeast Alaska. Listed below is a line-by-line

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[1] A definition of each recyclable material is provided in Spreadsheet 1, Footnote "a," attached.

"walk-through" of the spreadsheet.

1. "Shipping Cost (Per Ton)" is the cost per ton to ship each material (aluminum, auto batteries, auto bodies, cardboard, office paper, scrap metal, tires, and white goods) to prospective buyer(s) in Seattle, Washington; Bellingham, Washington; or Vancouver, British Columbia. In general, the lowest shipping rate for each material is presented in the spreadsheet, and the shipping company offering this rate is listed in the spreadsheet's footnotes.[2]

2. "Spot Charge at Origin (Per Ton)" is the per ton fee charged by a shipping company (or a trucking company) to deliver an empty shipping container to the processing center where the recyclable materials will be loaded, pick-up the full container at the processing center, and transport the container to the dockside for shipment to a buyer.

3. "Spot Charge at Destination (Per Ton)" is the per ton fee charged by a shipping company (or a trucking company) to pick-up a container at the destination port (i.e. at the port closest to the buyer), deliver the container to the buyer, and return the empty container to dockside.

4. "Total Costs For Transportation (Per Ton)" is the sum of 1, 2, and 3, above.

5. "Revenue Received at Destination (Per Ton)" is the price buyers are willing to pay for each recyclable material. The revenue is listed as a range to account for fluctuations in market prices. In general, the highest revenue offered by a buyer is represented in the spreadsheet. The prospective buyer(s) for each material is listed in the spreadsheet's footnotes. (Also see Footnote "2," below.)

6. "Revenue Minus Transportation Costs (Per Ton)" is calculated by subtracting the "total costs for transportation" (4, above) from the

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[2] For each recyclable material, the revenue offered by buyers varies among buyers, both within and among the three cities considered (Seattle, Bellingham, and Vancouver). Furthermore, the shipping costs to these cities also varies. After shipping costs to each port are compared to the revenue offered by a buyer (or buyers) from the city closest to the port, the most attractive "revenue minus cost" combination was chosen for representation in Spreadsheet 1 (i.e., the combination of shippers and buyers which offered the highest net revenue or the lowest net cost for each material is represented in the spreadsheet). The shipping cost estimates and the revenue estimates presented in this spreadsheet, therefore, represent the "best deal" for shipping and selling each recyclable material.

"revenue received at destination" (5, above). The result is the net cost per ton (or the net revenue per ton) for each recyclable material.

B. Spreadsheet 2: Summary of Revenue (Per Ton) Minus Transportation Costs (Per Ton) for Recyclable Materials in Eight Communities in Southeast Alaska.

This spreadsheet provides the net cost per ton (or net revenue per ton) for each material, for each community. The net cost or net revenue is presented as a range to account for fluctuations in the revenue offered by buyers. (The information contained in this spreadsheet is directly from Spreadsheet 1, Line 6, "revenue minus transportation costs," for each community.)

A positive value indicates that revenue per ton is greater than the transportation costs per ton; a negative value indicates that revenue per ton is less than transportation costs per ton; and a zero indicates that revenue per ton is equal to transportation costs per ton.

C. Assumptions Used to Compile Shipping Cost Estimates

Presented for each recyclable material, is a list of assumptions used to estimate the per ton shipping cost for that material.

II. INFORMATION ON SHIPPING RECYCLABLE MATERIALS

This section includes the following: names and phone numbers of shipping companies; shipping schedules; shipping costs (by container or by weight of materials); minimum and maximum weights for shipping containers; spot charges; and a glossary of terms. Each page in this section represents a table of information from one shipping company (and all shipping companies servicing a given community are included in this section).

The information listed on each table is read across the page. For example, for Alaska Marine Lines, Inc., to ship a 20 foot container of aluminum, the table first provides the "less than full" container load price, the minimum full container load price, the full container load price, the maximum container load weight, the port of destination, the spot charges from the port of origin, and the spot charges at the port of destination. (The cost information provided in these tables was used to estimate the per ton shipping costs and per ton spot charges for each material. These per ton costs are presented in the first three lines of Spreadsheet 1, Section I.)

A glossary of terms is provided following the shipping tables.

III. INFORMATION ON MARKETS FOR RECYCLABLE MATERIALS

This section provides: (1) a table which summarizes the range of revenue offered by all buyers contacted for the analysis; and (2) a set of eight tables which provides information on prospective buyers for each recyclable material.

A. The first table in this section is titled "Summary of Revenue (Per Ton) Offered for Recyclable Materials By Buyers in Seattle (WA), Bellingham (WA), and Vancouver (B.C.)." The table lists, for each recyclable material, the full range of revenue offered by all buyers in each city.

B. The second set of tables provides information on prospective buyers in Seattle, Vancouver, and Bellingham. Each page represents one recyclable material. Like the shipping cost information tables, these tables are read across the page.

Listed for each material is the following information:

1. Market trends;

2. The name, address, phone number, and where possible, a personal contact for prospective buyers;

3. The location of the port nearest the buyer;

4. The requirements for market preparation;

5. The requirements for storing the recyclable materials in shipping containers;

6. An indication of whether the shipping company will pick-up the materials at the dockside; and

7. The "current" range of revenue offered by buyers.

C. This section concludes with a glossary of terms.

A2: Revenue and Transportation Cost Summary of Eight Materials for Individual Communities

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TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN CRAIG

	RECYCLABLE MATERIAL (a)			
	Aluminum (b)	Auto Batteries (c)	Auto Bodies (d)	Cardboard (e)
Shipping Cost (Per Ton) (f)(g)	$51	$51	$39	$59
Spot Charge at Origin (Per Ton) (h)	$6	$5	$6	$4
Spot Charge at Destination (Per Ton) (i)	$5	$4	$5	$3
Total Costs For Transportation (Per Ton)	$63	$59	$49	$66
Revenue Received @ Destination (Per Ton)	$400 - $800	$60 - $90	$25 - $55	$50 - $75
Revenue Minus Transportation Costs (Per Ton)	$337 - $737	$1 - $31	($24) - $6	($16) - $9

	RECYCLABLE MATERIAL (a)			
	Office Paper (j)	Scrap Metal (k)	Tires (l)	White Goods (m)
Shipping Cost (Per Ton) (f)(g)	$59	$51 - $51	$60	$75 - $75
Spot Charge at Origin (Per Ton) (h)	$5	$3 - $5	$17	$10 - $35
Spot Charge at Destination (Per Ton) (i)	$4	$2 - $4	$14	$9 - $30
Total Costs For Transportation (Per Ton)	$68	$56 - $60	$91	$95 - $140
Revenue Received @ Destination (Per Ton)	$90 - $135	$40 - $70	($84) - $0	$15 - $30
Revenue Minus Transportation Costs (Per Ton)	$22 - $67	($20) - $14	($175) - ($91)	($125) - ($65)

Parentheses ( ) indicate a negative value.

Note that values are stored in the computer spreadsheet to two decimal places. Values presented on this spreadsheet, however, are whole numbers. As such, columns may not appear to add-up properly.

(a) Definition of each material:

Aluminum: Aluminum beverage and food containers, and scrap materials composed of aluminum such as window and door frames, lawn furniture frames, and drain pipes.

Auto Batteries: Common lead-acid batteries from cars, trucks, tractors, boats, snowmobiles, and motorcycles.

Auto Bodies: Whole auto bodies and reusable or rebuildable auto parts.

Cardboard: Brown uncoated "cardboard" boxes with a wavy core — uncontaminated (no plastic liners or wax coating).

Footnotes continued from Page 1.

(a) Definition of each material (continued):

Office Paper: White bond, Xerox, or notebook paper, and continuous form white computer paper.

Scrap Metal: Magnetic metal items such as steel, sheet metal products, pipes and other miscellaneous metal scraps.

Tires: Vehicle tires of all types.

White Goods: Large household appliances, or parts thereof, such as refrigerators, stoves, air conditioners, and washing machines.

(b) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron and Metal; The Purdy Company; Puget Sound Iron & Metals; Pacific Iron and Metals; or Weyerhaeuser.

(c) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Interstate Batteries in Seattle.

(d) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal or Puget Sound Iron & Metals (both in Seattle).

(e) Shipping company: Alaska Marine Lines, Inc. to Seattle. (Note that Alaska Outport Transportation Association, Inc. charges $50 per ton for shipping and $17.50 per ton for all spot charges, resulting in a cost of $1.20 more per ton than Alaska Marine Lines, Inc.) Buyer: Smurfit Recycling or Weyerhaeuser, both in Seattle area.

(f) Note that estimates include shipping costs only (and do not include costs associated with collection and processing of materials).

(g) All shipping cost estimates assume shipping containers are full, 20 foot containers (except for auto bodies which are shipped on 20 foot or 24 foot platforms).

(h) The spot charge at point of origin is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the point of loading. Containers are usually left on site ("spotted") for two days to allow for the loading of contents.

(i) The destination spot charge is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the end destination (i.e. the market). Containers are usually left on site ("spotted") for two days to allow for the unloading of contents.

(j) Shipping company: Alaska Outport Transportation Association, Inc. to Seattle, and Alaska Marine Lines, Inc. to Seattle charge the same (Alaska Outport, however, will take a maximum of only 10 tons per container; while Alaska Marine takes a maximum of 21 tons per container). Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.

(k) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal; The Purdy Company; or Puget Sound Iron and Metals; all of which are in Seattle. (Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) scrap metal, while the lower cost represents the spot charge per ton for baled scrap metal.)

(l) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Tire Recyclers, in the Seattle area.

(m) Shipping company: Alaska Marine Lines, Inc. to Seattle. (Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) white goods, while the lower cost represents the spot charge per ton for baled white goods.) Buyer: Seattle Iron & Metal or Puget Sound Iron and Metal, both in Seattle.

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TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN HAINES

	RECYCLABLE MATERIAL (a)			
	Aluminum (b)	Auto Batteries (c)	Auto Bodies (d)	Cardboard (e)
Shipping Cost (Per Ton) (f)(g)	$75	$73	$70	$83
Spot Charge at Origin (Per Ton) (h)	$6	$5	$6	$4
Spot Charge at Destination (Per Ton) (i)	$5	$4	$5	$3
Total Costs For Transportation (Per Ton)	$87	$81	$80	$90
Revenue Received @ Destination (Per Ton)	$400 - $800	$60 - $90	$25 - $55	$50 - $75
Revenue Minus Transportation Costs (Per Ton)	$313 - $713	($21) - $9	($55) - ($25)	($40) - ($15)

	RECYCLABLE MATERIAL (a)			
	Office Paper (j)	Scrap Metal (k)	Tires (l)	White Goods (m)
Shipping Cost (Per Ton) (f)(g)	$83	$73 - $73	$187	$124 - $124
Spot Charge at Origin (Per Ton) (h)	$5	$3 - $5	$17	$10 - $35
Spot Charge at Destination (Per Ton) (i)	$4	$2 - $4	$14	$9 - $30
Total Costs For Transportation (Per Ton)	$92	$78 - $82	$218	$144 - $189
Revenue Received @ Destination (Per Ton)	$90 - $135	$40 - $70	($84) - $0	$15 - $30
Revenue Minus Transportation Costs (Per Ton)	($2) - $43	($42) - ($8)	($302) - ($218)	($174) - ($114)

Parentheses ( ) indicate a negative value.

Note that values are stored in the computer spreadsheet to two decimal places. Values presented on this spreadsheet, however, are whole numbers. As such, columns may not appear to add-up properly.

(a) Definition of each material:

Aluminum: Aluminum beverage and food containers, and scrap materials composed of aluminum such as window and door frames, lawn furniture frames, and drain pipes.

Auto Batteries: Common lead-acid batteries from cars, trucks, tractors, boats, snowmobiles, and motorcycles.

Auto Bodies: Whole auto bodies and reusable or rebuildable auto parts.

Cardboard: Brown uncoated "cardboard" boxes with a wavy core — uncontaminated (no plastic liners or wax coating).

Footnotes continued from Page 1.

(a) Definition of each material (continued):

Office Paper: White bond, Xerox, or notebook paper, and continuous form white computer paper.

Scrap Metal: Magnetic metal items such as steel, sheet metal products, pipes and other miscellaneous metal scraps.

Tires: Vehicle tires of all types.

White Goods: Large household appliances, or parts thereof, such as refrigerators, stoves, air conditioners, and washing machines.

(b) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron and Metal; The Purdy Company; Puget Sound Iron & Metals; Pacific Iron and Metals; or Weyerhaeuser.

(c) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Interstate Batteries, Seattle.

(d) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal or Puget Sound Iron & Metals, both in Seattle.

(e) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.

(f) Note that estimates include shipping costs only (and do not include costs associated with collection and processing of materials).

(g) All shipping cost estimates assume shipping containers are full, 20 foot containers (except for auto bodies which are shipped on 20 foot or 24 foot platforms).

(h) The spot charge at point of origin is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the point of loading. Containers are usually left on site ("spotted") for two days to allow for the loading of contents.

(i) The destination spot charge is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the end destination (i.e. the market). Containers are usually left on site ("spotted") for two days to allow for the unloading of contents.

(j) Shipping company: Alaska Marine Lines, Inc.to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.

(k) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal; The Purdy Company; or Puget Sound Iron and Metals; all of which are in Seattle. (Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) scrap metal, while the lower cost represents the spot charge per ton for baled scrap metal.)

(l) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Tire Recyclers, in the Seattle area.

(m) Shipping company: Alaska Marine Lines, Inc. to Seattle. (Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) white goods, while the lower cost represents the spot charge per ton for baled white goods.) Buyer: Seattle Iron & Metal or Puget Sound and Metal, both in Seattle.

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TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN JUNEAU

	RECYCLABLE MATERIAL (a)			
	Aluminum (b)	Auto Batteries (c)	Auto Bodies (d)	Cardboard (e)
Shipping Cost (Per Ton) (f)(g)	$53	$63	$39	$35
Spot Charge at Origin (Per Ton) (h)	$6	$5	$6	$4
Spot Charge at Destination (Per Ton) (i)	$5	$4	$5	$3
Total Costs For Transportation (Per Ton)	$64	$72	$49	$42
Revenue Received @ Destination (Per Ton)	$400 - $800	$60 - $90	$25 - $55	$50 - $75
Revenue Minus Transportation Costs (Per Ton)	$336 - $736	($12) - $18	($24) - $6	$8 - $33

	RECYCLABLE MATERIAL (a)			
	Office Paper (j)	Scrap Metal (k)	Tires (l)	White Goods (m)
Shipping Cost (Per Ton) (f)(g)	$35	$35 - $63	$186	$87 - $87
Spot Charge at Origin (Per Ton) (h)	$5	$5 - $5	$17	$10 - $35
Spot Charge at Destination (Per Ton) (i)	$4	$4 - $4	$14	$9 - $30
Total Costs For Transportation (Per Ton)	$44	$44 - $72	$216	$106 - $152
Revenue Received @ Destination (Per Ton)	$90 - $135	$40 - $70	($84) - $0	$15 - $30
Revenue Minus Transportation Costs (Per Ton)	$46 - $91	($32) - $26	($300) - ($216)	($137) - ($76)

Parentheses ( ) indicate a negative value.

Note that values are stored in the computer spreadsheet to two decimal places. Values presented on this spreadsheet, however, are whole numbers. As such, columns may not appear to add-up properly.

(a) Definition of each material:

Aluminum: Aluminum beverage and food containers, and scrap materials composed of aluminum such as window and door frames, lawn furniture frames, and drain pipes.

Auto Batteries: Common lead-acid batteries from cars, trucks, tractors, boats, snowmobiles, and motorcycles.

Auto Bodies: Whole auto bodies and reusable or rebuildable auto parts.

Cardboard: Brown uncoated "cardboard" boxes with a wavy core — uncontaminated (no plastic liners or wax coating).

Footnotes continued from Page 1.

(a) Definition of each material (continued):

Office Paper: White bond, Xerox, or notebook paper, and continuous form white computer paper.

Scrap Metal: Magnetic metal items such as steel, sheet metal products, pipes and other miscellaneous metal scraps.

Tires: Vehicle tires of all types.

White Goods: Large household appliances, or parts thereof, such as refrigerators, stoves, air conditioners, and washing machines.

(b) Shipping company: Alaska Marine Lines, Inc. to Seattle.
(Note that AK-Pacific Barge Lines offers the same shipping cost per ton, but the local spot charge is $85 per container (vs. $50 per container for Alaska Marine Lines) and $75 per container for the destination spot charge (vs. $42 per container for Alaska Marine Lines).)
Buyer: Seattle Iron and Metal; The Purdy Company; Puget Sound Iron & Metals; Pacific Iron and Metals; or Weyerhaeuser.

(c) Shipping company: Alaska Marine Lines, Inc. to Seattle.
(Note that AK-Pacific Barge Lines offers the same shipping cost per ton, but the local spot charge is $85 per container (vs. $50 per container for Alaska Marine Lines) and $75 per container for the destination spot charge (vs. $42 per container for Alaska Marine Lines).)
Buyer: Interstate Batteries in Seattle.

(d) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal or Puget Sound Iron & Metals (both in Seattle).

(e) Shipping company: Alaska Marine Lines, Inc. to Seattle.
(Note that AK-Pacific Barge Lines offers the same shipping cost per ton, but the local spot charge is $85 per container (vs. $50 per container for Alaska Marine Lines) and $75 per container for the destination spot charge (vs. $42 per container for Alaska Marine Lines).)
Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.

(f) Note that estimates include shipping costs only (and do not include costs associated with collection and processing of materials).

(g) All shipping cost estimates assume shipping containers are full, 20 foot containers (except for auto bodies which are shipped on 20 foot or 24 foot platforms).

(h) The spot charge at point of origin is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the point of loading. Containers are usually left on site ("spotted") for two days to allow for the loading of contents.

(i) The destination spot charge is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the end destination (i.e. the market). Containers are usually left on site ("spotted") for two days to allow for the unloading of contents.

(j) Shipping company: Alaska Marine Lines, Inc. to Seattle.
(Note that AK-Pacific Barge Lines offers the same shipping cost per ton, but the local spot charge is $85 per container (vs. $50 per container for Alaska Marine Lines) and $75 per container for the destination spot charge (vs. $42 per container for Alaska Marine Lines).)
Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.

(k) Shipping company: For baled scrap metal, the least expensive shipping company is AK-Pacific Barge Lines to Seattle (a minimum of 18 tons of scrap metal is required to obtain this shipping rate)--the cost to ship baled scrap metal is represented by the lower cost on the spreadsheet; Alaska Marine Lines, Inc. to Seattle is the least expensive shipping company for "loose" (not baled) scrap metal--the higher value represented on the spreadsheet is for loose scrap metal. (Note that AK-Pacific Barge Lines offers a slightly lower shipping cost ($60.20 per ton) than Alaska Marine Lines ($63 per ton) for loose scrap metal, but the local spot charge is $85 per container (vs. $50 per container for Alaska Marine Lines) and $75 per container for the destination spot charge (vs. $42 per container for Alaska Marine Lines).)
Buyer: Seattle Iron and Metal; The Purdy Company; or Puget Sound Iron & Metals; all of which are in Seattle.

Footnotes (continued)

(l) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Tire Recyclers, in the Seattle area.

(m) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal or Puget Sound Iron and Metal, both in Seattle. (Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) white goods, while the lower cost represents the spot charge per ton for baled white goods.)

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TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN KETCHIKAN

	RECYCLABLE MATERIAL (a)			
	Aluminum (b)	Auto Batteries (c)	Auto Bodies (d)	Cardboard (e)
Shipping Cost (Per Ton) (f)(g)	$41	$37	$29	$37
Spot Charge at Origin (Per Ton) (h)	$7	$5	$6	$4
Spot Charge at Destination (Per Ton) (i)	$10	$7	$8	$6
Total Costs For Transportation (Per Ton)	$58	$49	$44	$47
Revenue Received @ Destination (Per Ton)	$400 - $800	$60 - $90	$25 - $55	$50 - $75
Revenue Minus Transportation Costs (Per Ton)	$342 - $742	$11 - $41	($19) - $11	$3 - $28

	RECYCLABLE MATERIAL (a)			
	Office Paper (j)	Scrap Metal (k)	Tires (l)	White Goods (m)
Shipping Cost (Per Ton) (f)(g)	$37	$37 - $37	$60	$75 - $75
Spot Charge at Origin (Per Ton) (h)	$5	$3 - $6	$17	$10 - $35
Spot Charge at Destination (Per Ton) (i)	$7	$4 - $8	$14	$9 - $30
Total Costs For Transportation (Per Ton)	$49	$44 - $50	$91	$95 - $140
Revenue Received @ Destination (Per Ton)	$90 - $135	$40 - $70	($84) - $0	$15 - $30
Revenue Minus Transportation Costs (Per Ton)	$41 - $86	($10) - $26	($175) - ($91)	($125) - ($65)

Parentheses ( ) indicate a negative value.

Note that values are stored in the computer spreadsheet to two decimal places. Values presented on this spreadsheet, however, are whole numbers. As such, columns may not appear to add-up properly.

(a) Definition of each material:

Aluminum: Aluminum beverage and food containers, and scrap materials composed of aluminum such as window and door frames, lawn furniture frames, and drain pipes.

Auto Batteries: Common lead-acid batteries from cars, trucks, tractors, boats, snowmobiles, and motorcycles.

Auto Bodies: Whole auto bodies and reusable or rebuildable auto parts.

Cardboard: Brown uncoated "cardboard" boxes with a wavy core — uncontaminated (no plastic liners or wax coating).

Footnotes continued from Page 1.

(a) Definition of each material (continued):

Office Paper: White bond, Xerox, or notebook paper, and continuous form white computer paper.

Scrap Metal: Magnetic metal items such as steel, sheet metal products, pipes and other miscellaneous metal scraps.

Tires: Vehicle tires of all types.

White Goods: Large household appliances, or parts thereof, such as refrigerators, stoves, air conditioners, and washing machines.

(b) Shipping company: Boyer Barge, to Seattle. Buyer: Seattle Iron and Metal; The Purdy Company; Puget Sound Iron & Metals; Pacific Iron and Metals; or Weyerhaeuser.

(c) Shipping company: Boyer Barge, to Seattle. Buyer: Interstate Batteries in Seattle.

(d) Shipping company: Boyer Barge to Seattle. Buyer: Seattle Iron & Metal or Puget Sound Iron & Metals, both in Seattle.

(e) Shipping company: Boyer Barge, to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in Seattle area.

(f) Note that estimates include shipping costs only (and do not include costs associated with collection and processing of materials).

(g) All shipping cost estimates assume shipping containers are full, 20 foot containers (except for auto bodies which are shipped on 20 foot or 24 foot platforms).

(h) The spot charge at point of origin is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the point of loading. Containers are usually left on site ("spotted") for two days to allow for the loading of contents.

(i) The destination spot charge is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the end destination (i.e. the market). Containers are usually left on site ("spotted") for two days to allow for the unloading of contents.

(j) Shipping company: Boyer Barge, to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in Seattle area.

(k) Shipping company: Boyer Barge, to Seattle. Buyer: Seattle Iron and Metal; The Purdy Company; or Puget Sound Iron & Metals; all of which are in Seattle.
(Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) scrap metal, while the lower cost represents the spot charge per ton for baled scrap metal.)

(l) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Tire Recyclers, in the Seattle area.

(m) Shipping company: Alaska Marine Lines, Inc. to Seattle. (Note that for shipping baled white goods, Boyer Barge is comparable in cost to Alaska Marine Lines.) (Also note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) white goods, while the lower cost represents the spot charge per ton for baled white goods.)
Buyer: Seattle Iron & Metal or Puget Sound Iron and Metal, both in Seattle.

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TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN PETERSBURG

	RECYCLABLE MATERIAL (a)			
	Aluminum (b)	Auto Batteries (c)	Auto Bodies (d)	Cardboard (e)
Shipping Cost (Per Ton) (f)(g)	$57	$58	$39	$74
Spot Charge at Origin (Per Ton) (h)	$6	$5	$6	$4
Spot Charge at Destination (Per Ton) (i)	$5	$4	$5	$3
Total Costs For Transportation (Per Ton)	$68	$67	$49	$81
Revenue Received @ Destination (Per Ton)	$400 - $800	$60 - $90	$25 - $55	$50 - $75
Revenue Minus Transportation Costs (Per Ton)	$332 - $732	($7) - $23	($24) - $6	($31) - ($6)

	RECYCLABLE MATERIAL (a)			
	Office Paper (j)	Scrap Metal (k)	Tires (l)	White Goods (m)
Shipping Cost (Per Ton) (f)(g)	$74	$58 - $58	$69	$87 - $87
Spot Charge at Origin (Per Ton) (h)	$5	$3 - $5	$17	$10 - $35
Spot Charge at Destination (Per Ton) (i)	$4	$2 - $4	$14	$9 - $30
Total Costs For Transportation (Per Ton)	$83	$63 - $67	$100	$106 - $152
Revenue Received @ Destination (Per Ton)	$90 - $135	$40 - $70	($84) - $0	$15 - $30
Revenue Minus Transportation Costs (Per Ton)	$7 - $52	($27) - $7	($183) - ($100)	($137) - ($76)

Parentheses ( ) indicate a negative value.

Note that values are stored in the computer spreadsheet to two decimal places. Values presented on this spreadsheet, however, are whole numbers. As such, columns may not appear to add-up properly.

(a) Definition of each material:

Aluminum: Aluminum beverage and food containers, and scrap materials composed of aluminum such as window and door frames, lawn furniture frames, and drain pipes.

Auto Batteries: Common lead-acid batteries from cars, trucks, tractors, boats, snowmobiles, and motorcycles.

Auto Bodies: Whole auto bodies and reusable or rebuildable auto parts.

Cardboard: Brown uncoated "cardboard" boxes with a wavy core — uncontaminated (no plastic liners or wax coating).

Footnotes continued from Page 1.

(a) Definition of each material (continued):

Office Paper: White bond, Xerox, or notebook paper, and continuous form white computer paper.

Scrap Metal: Magnetic metal items such as steel, sheet metal products, pipes and other miscellaneous metal scraps.

Tires: Vehicle tires of all types.

White Goods: Large household appliances, or parts thereof, such as refrigerators, stoves, air conditioners, and washing machines.

(b) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron and Metal; The Purdy Company; Puget Sound Iron and Metals; Pacific Iron and Metals; or Weyerhaeuser.

(c) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Interstate Batteries in Seattle.
(Note that Northland Services Inc. charges the same price per ton to ship this material, but the Seattle spot charge is slightly higher than Alaska Marine Lines, Inc. ($42 per container vs. $50 per container).)

(d) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal or Puget Sound Iron & Metals, both in Seattle.

(e) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Smurfit or Weyerhaeuser, both in the Seattle area.
(Note that Northland Services Inc. charges the same price per ton to ship this material, but the Seattle spot charge is slightly higher than Alaska Marine Lines, Inc. ($42 per container vs. $50 per container).)

(f) Note that estimates include shipping costs only (and do not include costs associated with collection and processing of materials).

(g) All shipping cost estimates assume shipping containers are full, 20 foot containers (except for auto bodies which are shipped on 20 foot or 24 foot platforms).

(h) The spot charge at point of origin is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the point of loading. Containers are usually left on site ("spotted") for two days to allow for the loading of contents.

(i) The destination spot charge is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the end destination (i.e. the market). Containers are usually left on site ("spotted") for two days to allow for the unloading of contents.

(j) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Smurfit or Weyerhaeuser, both in the Seattle area.
(Note that Northland Services Inc. charges the same price per ton to ship this material, but the Seattle spot charge is slightly higher than Alaska Marine Lines, Inc. ($42 per container vs. $50 per container).)

(k) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal; The Purdy Company; or Puget Sound Iron and Metals; all of which are in Seattle. (Note that Northland Services Inc. charges the same price per ton to ship this material, but the Seattle spot charge is slightly higher than Alaska Marine Lines, Inc. ($42 per container vs. $50 per container).)
(Also note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) scrap metal, while the lower cost represents the spot charge per ton for baled scrap metal.)

(l) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Tire Recyclers, in the Seattle area.

(m) Shipping company: Alaska Marine Lines, Inc. to Seattle. (Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) white goods, while the lower cost represents the spot charge per ton for baled white goods.)
Buyer: Seattle Iron & Metal or Puget Sound Iron and Metals, both in Seattle.

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TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN SITKA

	RECYCLABLE MATERIAL (a)			
	Aluminum (b)	Auto Batteries (c)	Auto Bodies (d)	Cardboard (e)
Shipping Cost (Per Ton) (f)(g)	$74	$58	$47	$81
Spot Charge at Origin (Per Ton) (h)	$6	$5	$6	$4
Spot Charge at Destination (Per Ton) (i)	$6	$4	$5	$3
Total Costs For Transportation (Per Ton)	$87	$67	$57	$89
Revenue Received @ Destination (Per Ton)	$400 - $800	$60 - $90	$25 - $55	$50 - $75
Revenue Minus Transportation Costs (Per Ton)	$313 - $713	($7) - $23	($32) - ($2)	($39) - ($14)

	RECYCLABLE MATERIAL (a)			
	Office Paper (j)	Scrap Metal (k)	Tires (l)	White Goods (m)
Shipping Cost (Per Ton) (f)(g)	$81	$58 - $58	$187	$107 - $107
Spot Charge at Origin (Per Ton) (h)	$5	$3 - $5	$17	$10 - $35
Spot Charge at Destination (Per Ton) (i)	$4	$2 - $4	$14	$9 - $30
Total Costs For Transportation (Per Ton)	$90	$63 - $67	$218	$127 - $172
Revenue Received @ Destination (Per Ton)	$90 - $135	$40 - $70	($84) - $0	$15 - $30
Revenue Minus Transportation Costs (Per Ton)	($0) - $45	($27) - $7	($301) - ($218)	($157) - ($97)

Parentheses ( ) indicate a negative value.

Note that values are stored in the computer spreadsheet to two decimal places. Values presented on this spreadsheet, however, are whole numbers. As such, columns may not appear to add-up properly.

(a) Definition of each material:

Aluminum: Aluminum beverage and food containers, and scrap materials composed of aluminum such as window and door frames, lawn furniture frames, and drain pipes.

Auto Batteries: Common lead-acid batteries from cars, trucks, tractors, boats, snowmobiles, and motorcycles.

Auto Bodies: Whole auto bodies and reusable or rebuildable auto parts.

Cardboard: Brown uncoated "cardboard" boxes with a wavy core --- uncontaminated (no plastic liners or wax coating).

Footnotes continued from Page 1.

(a) Definition of each material (continued):

Office Paper: White bond, Xerox, or notebook paper, and continuous form white computer paper.

Scrap Metal: Magnetic metal items such as steel, sheet metal products, pipes and other miscellaneous metal scraps.

Tires: Vehicle tires of all types.

White Goods: Large household appliances, or parts thereof, such as refrigerators, stoves, air conditioners, and washing machines.

(b) Shipping company: Northland Services, Inc. to Seattle. Buyer: Seattle Iron and Metal; The Purdy Company; Puget Sound Iron & Metals; Pacific Iron and Metals; or Weyerhaeuser.

(c) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Interstate Batteries, in Seattle.
(Note that Northland Services, Inc. offers the same shipping cost per ton, but it has a slightly higher destination spot charge: $50 per container for Northland vs. $42 per container for Alaska Marine Lines.)

(d) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal or Puget Sound Iron & Metals, both in Seattle.

(e) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.
(Note that Northland Services, Inc. offers the same shipping cost per ton, but it has a slightly higher destination spot charge: $50 per container for Northland vs. $42 per container for Alaska Marine Lines.)

(f) Note that estimates include shipping costs only (and do not include costs associated with collection and processing of materials).

(g) All shipping cost estimates assume shipping containers are full, 20 foot containers (except for auto bodies which are shipped on 20 foot or 24 foot platforms).

(h) The spot charge at point of origin is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the point of loading. Containers are usually left on site ("spotted") for two days to allow for the loading of contents.

(i) The destination spot charge is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the end destination (i.e. the market). Containers are usually left on site ("spotted") for two days to allow for the unloading of contents.

(j) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.
(Note that Northland Services, Inc. offers the same shipping cost per ton, but it has a slightly higher destination spot charge: $50 per container for Northland vs. $42 per container for Alaska Marine Lines.)

(k) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal; The Purdy Company; or Puget Sound Iron and Metals; all of which are in the Seattle area.
(Note that Northland Services, Inc. offers the same shipping cost per ton, but it has a slightly higher destination spot charge: $50 per container for Northland vs. $42 per container for Alaska Marine Lines.)
(Also note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) scrap metal, while the lower cost represents the spot charge per ton for baled scrap metal.)

(l) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Tire Recyclers, in the Seattle area.

(m) Shipping company: Alaska Marine Lines, Inc. to Seattle. (Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) white goods, while the lower cost represents the spot charge per ton for baled white goods.)
Buyer: Seattle Iron & Metal or Puget Sound Iron and Metals, both in Seattle.

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TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN SKAGWAY

	RECYCLABLE MATERIAL (a)			
	Aluminum (b)	Auto Batteries (c)	Auto Bodies (d)	Cardboard (e)
Shipping Cost (Per Ton) (f)(g)	$92	$120	$89	$91
Spot Charge at Origin (Per Ton) (h)	$6	$0	$6	$4
Spot Charge at Destination (Per Ton) (i)	$5	$0	$5	$3
Total Costs For Transportation (Per Ton)	$104	$120	$99	$99
Revenue Received @ Destination (Per Ton)	$400 - $800	$100 - $140	$25 - $55	$50 - $75
Revenue Minus Transportation Costs (Per Ton)	$296 - $696	($20) - $20	($74) - ($44)	($49) - ($24)

	RECYCLABLE MATERIAL (a)			
	Office Paper (j)	Scrap Metal (k)	Tires (l)	White Goods (m)
Shipping Cost (Per Ton) (f)(g)	$91	$72 - $92	$193	$125 - $125
Spot Charge at Origin (Per Ton) (h)	$5	$0 - $5	$17	$10 - $35
Spot Charge at Destination (Per Ton) (i)	$4	$0 - $4	$14	$9 - $30
Total Costs For Transportation (Per Ton)	$100	$72 - $101	$224	$144 - $190
Revenue Received @ Destination (Per Ton)	$90 - $135	$40 - $70	($84) $0	$15 - $30
Revenue Minus Transportation Costs (Per Ton)	($10) - $35	($61) - ($2)	($308) - ($224)	($175) - ($114)

Parentheses ( ) indicate a negative value.

Note that values are stored in the computer spreadsheet to two decimal places. Values presented on this spreadsheet, however, are whole numbers. As such, columns may not appear to add-up properly.

(a) Definition of each material:

Aluminum: Aluminum beverage and food containers, and scrap materials composed of aluminum such as window and door frames, lawn furniture frames, and drain pipes.

Auto Batteries: Common lead-acid batteries from cars, trucks, tractors, boats, snowmobiles, and motorcycles.

Auto Bodies: Whole auto bodies and reusable or rebuildable auto parts.

Cardboard: Brown uncoated "cardboard" boxes with a wavy core --- uncontaminated (no plastic liners or wax coating).

Footnotes continued from Page 1.

(a) Definition of each material (continued):

Office Paper: White bond, Xerox, or notebook paper, and continuous form white computer paper.

Scrap Metal: Magnetic metal items such as steel, sheet metal products, pipes and other miscellaneous metal scraps.

Tires: Vehicle tires of all types.

White Goods: Large household appliances, or parts thereof, such as refrigerators, stoves, air conditioners, and washing machines.

(b) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron and Metal; The Purdy Company; Puget Sound Iron & Metals; Pacific Iron and Metals; or Weyerhaeuser.

(c) Shipping company: White Pass Alaska to Vancouver, B.C. Buyer: K.C. Recycling in the Vancouver, B.C. area.
(Note that the local spot charge and the destination spot charge are included in the shipping cost. Also note that a minimum of 24 tons of batteries must be delivered to obtain the revenue listed. Furthermore, note that the cost per ton to ship to Seattle on Alaska Marine Lines, Inc. is cheaper (but the revenue offered in Seattle is less): total transportation costs on Alaska Marine Lines = $100.52 per ton, with a revenue of $60 to $90 offered in Seattle, for a revenue minus cost of (-$40) per ton to (-$10) per ton.)

(d) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal; or Puget Sound Iron & Metals, both in Seattle.

(e) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.
(Note that the shipping company "White Pass Alaska" offers a shipping cost to Vancouver that is only slightly higher than Alaska Marine Lines to Seattle. The revenue offered in Vancouver is $50 to $70 per ton, compared with $50 to $75 per ton offered in Seattle.)

(f) Note that estimates include shipping costs only (and do not include costs associated with collection and processing of materials).

(g) All shipping cost estimates assume shipping containers are full, 20 foot containers (except for auto bodies which are shipped on 20 foot or 24 foot platforms).

(h) The spot charge at point of origin is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the point of loading. Containers are usually left on site ("spotted") for two days to allow for the loading of contents.

(i) The destination spot charge is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the end destination (i.e. the market). Containers are usually left on site ("spotted") for two days to allow for the unloading of contents.

(j) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.

(k) Shipping company: For baled scrap metal, the least expensive shipping company is White Pass Alaska, to Vancouver (18 tons of scrap metal is required to obtain this shipping rate) -- the cost to ship baled scrap metal to Vancouver is represented by the lower cost on the spreadsheet; the least expensive shipping company for loose (not baled) scrap metal is Alaska Marine Lines, Inc. to Seattle -- the higher value represented on the spreadsheet is for loose scrap metal. (Note that the local spot charge and the destination spot charge are included in the lower range of shipping costs.)
Buyer: Pacific Metals in Vancouver; and Seattle Iron & Metal, The Purdy Company, or Puget Sound Iron and Metals, all three in Seattle.

(l) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Tire Recyclers, in the Seattle area.

(m) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Seattle Iron & Metal or Puget Sound Iron and Metal, both in Seattle.
(Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) white goods, while the lower cost represents the spot charge per ton for baled white goods.)

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TRANSPORTATION COST ESTIMATES AND REVENUE ESTIMATES FOR RECYCLABLE MATERIALS IN WRANGELL

	RECYCLABLE MATERIAL (a)			
	Aluminum (b)	Auto Batteries (c)	Auto Bodies (d)	Cardboard (e)
Shipping Cost (Per Ton) (f)(g)	$45	$38	$32	$38
Spot Charge at Origin (Per Ton) (h)	$7	$5	$6	$4
Spot Charge at Destination (Per Ton) (i)	$10	$7	$8	$6
Total Costs For Transportation (Per Ton)	$62	$50	$47	$48
Revenue Received @ Destination (Per Ton)	$400 - $800	$60 - $90	$25 - $55	$50 - $75
Revenue Minus Transportation Costs (Per Ton)	$338 - $738	$10 - $40	($22) - $8	$2 - $27

	RECYCLABLE MATERIAL (a)			
	Office Paper (j)	Scrap Metal (k)	Tires (l)	White Goods (m)
Shipping Cost (Per Ton) (f)(g)	$38	$62 - $58	$69	$74 - $87
Spot Charge at Origin (Per Ton) (h)	$5	$0 - $5	$17	$11 - $35
Spot Charge at Destination (Per Ton) (i)	$7	$0 - $4	$14	$16 - $30
Total Costs For Transportation (Per Ton)	$50	$62 - $67	$100	$101 - $152
Revenue Received @ Destination (Per Ton)	$90 - $135	$40 - $70	($84) $0	$15 - $30
Revenue Minus Transportation Costs (Per Ton)	$40 - $85	($27) - $8	($183) - ($100)	($137) - ($71)

Parentheses ( ) indicate a negative value.

Note that values are stored in the computer spreadsheet to two decimal places. Values presented on this spreadsheet, however, are whole numbers. As such, columns may not appear to add-up properly.

(a) Definition of each material:

Aluminum: Aluminum beverage and food containers, and scrap materials composed of aluminum such as window and door frames, lawn furniture frames, and drain pipes.

Auto Batteries: Common lead-acid batteries from cars, trucks, tractors, boats, snowmobiles, and motorcycles.

Auto Bodies: Whole auto bodies and reusable or rebuildable auto parts.

Cardboard: Brown uncoated "cardboard" boxes with a wavy core --- uncontaminated (no plastic liners or wax coating).

Footnotes continued from Page 1.

(a) Definition of each material (continued):

Office Paper: White bond, Xerox, or notebook paper, and continuous form white computer paper.

Scrap Metal: Magnetic metal items such as steel, sheet metal products, pipes and other miscellaneous metal scraps.

Tires: Vehicle tires of all types.

White Goods: Large household appliances, or parts thereof, such as refrigerators, stoves, air conditioners, and washing machines.

(b) Shipping company: Boyer Barge to Seattle. Buyer: Seattle Iron and Metal; The Purdy Company; Puget Sound Iron & Metals; Pacific Iron and Metals; or Weyerhaeuser.

(c) Shipping company: Boyer Barge, to Seattle. Buyer: Interstate Batteries in the Seattle area.

(d) Shipping company: Boyer Barge to Seattle. Buyer: Seattle Iron and Metal or Puget Sound Iron & Metals, both in Seattle.
(Note that Alaska Marine Lines, Inc. charges $2 per ton more than Boyer Barge to ship this material to Seattle.)

(e) Shipping company: Boyer Barge to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.

(f) Note that estimates include shipping costs only (and do not include costs associated with collection and processing of materials).

(g) All shipping cost estimates assume shipping containers are full, 20 foot containers (except for auto bodies which are shipped on 20 foot or 24 foot platforms).

(h) The spot charge at point of origin is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the point of loading. Containers are usually left on site ("spotted") for two days to allow for the loading of contents.

(i) The destination spot charge is the fee charged by a barge line to deliver, drop off, and pick up a container to and from the end destination (i.e. the market). Containers are usually left on site ("spotted") for two days to allow for the unloading of contents.

(j) Shipping company: Boyer Barge, to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.

(k) The least expensive shipping company for baled scrap metal is White Pass Alaska to Vancouver, British Columbia. The least expensive shipping company for loose (not baled) scrap metal is Alaska Marine Lines, Inc. to Seattle.
Buyer in Vancouver: Pacific Metals. Buyer in Seattle: Seattle Iron & Metal; The Purdy Company; or Puget Sound Iron and Metals.
(Note that the local and destination spot charges are included in the lower range of shipping costs (i.e., the White Pass Alaska shipping costs to Vancouver).)
(Also note that Boyer Barge charges the same as Alaska Marine Lines for baled scrap metal (but for shipping loose scrap metal, Boyer Barge would be more expensive than Alaska Marine Lines. In addition, Northland Services, Inc. offers the same shipping cost per ton as Alaska Marine Lines (for baled and loose scrap metal) to Seattle, with a slightly higher Seattle spot charge: $50 per container for Northland and $42 per container for Alaska Marine Lines.)
(Finally, note that the spreadsheet provides a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) scrap metal, while the lower cost represents the spot charge per ton for baled scrap metal.)

(l) Shipping company: Alaska Marine Lines, Inc. to Seattle. Buyer: Tire Recyclers, in the Seattle area.

(m) Shipping company: Boyer Barge, to Seattle. Buyer: Smurfit Recycling or Weyerhaeuser, both in the Seattle area.
(Note that there is a range of spot charges. The higher cost represents the spot charge per ton for loose (not baled) white goods, while the lower cost represents the spot charge per ton for baled white goods.)

ASSUMPTIONS USED TO COMPILE SHIPPING COST ESTIMATES[1]

1. ALUMINUM

   - Baled into bales with dimensions: 42"x32"x60".
   - Bale weight: 750 pounds.
   - 21 bales per 20 foot container.
   - 7.88 tons per 20 foot container.

2. AUTO BATTERIES

   - Average battery weight: 35 pounds.
   - Average pallet weight: 2,700 pounds.
   - 8 pallets per 20 foot container.
   - 10.8 tons per 20 foot container.

3. AUTO BODIES

   - Automobiles are stripped and crushed with an auto crusher.
   - One auto body weighs approximately one ton.
   - Auto bodies are shipped on 20 foot or 24 foot platforms.
   - 9 auto bodies per 20 foot platform; 10 auto bodies per 24 foot platform.

4. CARDBOARD

   - Baled into bales with dimensions: 42"x32"x60".
   - Bale weight: 1,200 pounds.
   - 21 bales per 20 foot container.
   - 12.6 tons per 20 foot container.

5. OFFICE PAPER

   - Baled into bales with dimensions: 42"x32"x60".
   - Bale weight: 1,000 pounds.
   - 21 bales per 20 foot container.
   - 10.5 tons per 20 foot container.

6. SCRAP METAL

   - Scrap metal loose: 10 tons per 20 foot container.
   - Scrap metal baled: 18 tons per 20 foot container.

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[1] Data compiled by R.W. Beck and Associates.

7. TIRES

- Average passenger tire weight: 12 pounds.
- 500 tires per 20 foot container.
- 3 tons per 20 foot container.

8. WHITE GOODS

- 14 white goods per ton.
- Cost of shipping based on both loose (not baled) and baled white goods:

  1.2 tons per 20 foot container (loose); and
  4.8 tons per 20 foot container (baled).

A3: Information on Shipping Recyclables

PORT OF ORIGIN: CRAIG

BARGE LINE: ALASKA MARINE LINES, INC.
PO Box 24348
Seattle, WA 98124
(206) 763-4244
(800) 950-4265

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

SCHEDULE: Service from Craig is at least once a week.

CONTAINER SIZE: 20 FEET

MATERIALS	ITEM #	LCL PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	CRAIG SPOT (4)	SEATTLE SPOT (3) (5)
Aluminum	7080	3.77 cwt	5 tons	$2.56 cwt	21 tons	Seattle	$50	$42
Auto Bodies	7685	N/A	AQ	$347 (20' platform)	21 tons	Seattle	$50	$42
Auto Batteries	7680	$3.77 cwt	10 tons	$2.53 cwt	21 tons	Seattle	$50	$42
Other Batteries	7680	$3.77 cwt	10 tons	$2.53 cwt	21 tons	Seattle	$50	$42
Tires	7700	N/A	AQ	$3.02 cwt	21 tons	Seattle	$50	$42
Cardboard	7565	$3.81 cwt	9 tons	2.95 cwt	21 tons	Seattle	$50	$42
HHW	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	7565	$3.81 cwt	9 tons	2.95 cwt	21 tons	Seattle	$50	$42
White Goods	0100	$3.77 cwt	10 tons	$2.53 cwt	21 tons	Seattle	$50	$42
Scrap Metal	7680	$3.77 cwt	10 tons	$2.53 cwt	21 tons	Seattle	$50	$42

(1) Minimum charge per shipment is $32.

(2) Rates are subject to change after 11/30/91. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(3) Delivery to Kent is $58.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Craigaml.wk3

PORT OF ORIGIN: CRAIG

BARGE LINE: BOYER BARGE
7318 4th Ave. South, Seattle WA 98108
(206) 763–8575
(907) 225–2093

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
NA = Not applicable
AQ = Any quantity

SCHEDULE: Container loads leave Craig on Fridays, and are transloaded to a Seattle bound barge in Ketchikan.

CONTAINER SIZE: 20 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	CRAIG SPOT (3)	SEATTLE SPOT (4)
Aluminum	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +
Auto Bodies	N/A	N/A	$684.72 (20' platform)	20 tons	Seattle	Included	$75 +
Auto Batteries	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +
Other Batteries	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +
Tires	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +
Cardboard	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +
Office Paper	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +
White Goods	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +
Scrap Metal	N/A	AQ up to 8.6 tons 8.6 tons plus	$745 each $420 + $1.83 cwt	8.6 tons 20 tons	Seattle	Included	$75 +

(1) Material types may be commingled in a container.

(2) Boyer indicated that they may be willing to look into the shipment of HHW in the future.

(3) The fee charged by a barge line to deliver, drop–off and pickup a container to and from the point of loading.

(4) The fee charged by a barge line to deliver, drop–off and pickup a container to and from the end destination.

Craigboy.wk3

PORT OF ORIGIN: CRAIG

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: ALASKA OUTPORT TRANSPORTATION ASSOCIATION, INC.
659 N E Northlake Way
(206) 632-7744
(800) 682-2682

Schedule: Alaska Outport leaves Craig approximately every 3 weeks. Containers and pallets must be delivered three days before sailing date.

CONTAINER SIZE: 20 FEET

PALLET SIZE: Standard dimensions are 40" x 48" x 6"

MATERIALS	MINIMUM TOTAL PALLET WEIGHT	PALLET PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	CRAIG SPOT (3)(6)	SEATTLE SPOT (7)
METALS INCLUDING: Aluminum, Auto Batteries, Other Batteries, Scrap Metal								
	N/A	N/A	AQ	$500	10 tons	Seattle	$100+	$75 +
	2.5 tons	3.50 cwt	N/A	N/A	N/A	Seattle	N/A	$75 +
Auto Bodies		N/A	N/A	N/A	N/A	N/A	N/A	N/A
Tires (4)	N/A	N/A	N/A	$500	10 tons	Seattle	$100+	$75 +
	<1 ton	$16.25 cwt	N/A	N/A	N/A	Seattle	N/A	$75 +
	1 ton - 5 ton	$6.25 cwt	N/A	N/A	N/A	Seattle	N/A	$75 +
	5 ton +	$3.75 cwt	N/A	N/A	N/A	Seattle	N/A	$75 +
FIBER GRADES INCLUDING: Cardboard, Office Paper								
	N/A	N/A	N/A	$500	10 tons	Seattle	$100+	$75 +
	<5 ton	$16 cwt	N/A	N/A	N/A	Seattle	N/A	$75 +
	5 ton - 15 ton	$7.69 cwt	N/A	N/A	N/A	Seattle	N/A	$75 +
	15 ton +	$6.26 cwt	N/A	N/A	N/A	Seattle	N/A	$75 +
HAZARDOUS WASTE INCLUDING: HHW (5), Waste Oil (5)								
	< 10 ton	$14 cwt	N/A	N/A	N/A	Seattle	N/A	N/A
	10 ton - 20 ton	$8.50 cwt	N/A	N/A	N/A	Seattle	N/A	N/A
	20 ton +	$5.50 cwt	N/A	N/A	N/A	Seattle	N/A	N/A
White Goods	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

(1) Material must be strapped to pallets, and forkliftable. Material must be flat on top so that pallets can be stacked.

(2) Materials stored in the containers need to be secured so as to prevent internal damage of the container.

(3) It is the responsibility of the shipper to deliver pallets to the dock.

(4) Tires should be stacked six high and strapped to pallets.

(5) HHW must be shipped through one of the various hazardous waste services.

(6) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(7) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Craigaot.wk3

PORT OF ORIGIN: HAINES

BARGE LINE: ALASKA MARINE LINES, INC.
PO Box 24348
Seattle, WA 98124
(206) 763-4244
(800) 950-4265

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable

SCHEDULE: Service from Haines is at least once a week.

CONTAINER SIZE: 20 FEET

MATERIALS	ITEM #	LCL PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	HAINES SPOT	SEATTLE SPOT (3)
Aluminum	7080	6.22 cwt	5 tons	$3.76 cwt	21 tons	Seattle	$50	$42
Auto Bodies	7685	N/A	AQ	$628 (20' platform)	21 tons	Seattle	$50	$42
Auto Batteries	7680	$6.22 cwt	9 tons	$3.64 cwt	21 tons	Seattle	$50	$42
Other Batteries	7680	$6.22 cwt	9 tons	$3.64 cwt	21 tons	Seattle	$50	$42
Tires	7700	$9.37 cwt	6 tons	$6.03 cwt	21 tons	Seattle	$50	$42
Cardboard	7565	$6.45 cwt	9 tons	4.14 cwt	21 tons	Seattle	$50	$42
HHW	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	7565	$6.45 cwt	9 tons	4.14 cwt	21 tons	Seattle	$50	$42
White Goods	0100	$6.22 cwt	9 tons	$3.64 cwt	21 tons	Seattle	$50	$42
Scrap Metal	7680	$6.22 cwt	9 tons	$3.64 cwt	21 tons	Seattle	$50	$42

(1) Minimum charge per shipment is $32.

(2) Rates are subject to change after 11/30/91. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(3) Delivery to Kent is $58.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Hainesam.wk3

PORT OF ORIGIN: HAINES

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: LYNDEN TRANSPORT
550 South Franklin St
Juneau, AK 99801
(907) 586-6600
Kathleen Cambell
(206) 575-9575
Bob Sandberg

SCHEDULE: Lynden Transport works with Alaska Marine Highway System (AMHS) in transporting materials to to Seattle and Bellingham. Service is at least once a week and based on AMHS' departure schedule.

CONTAINER SIZE: 27 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE/ BELLINGHAM SPOT (4)
Aluminum	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included
Auto Bodies	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included
Auto Batteries	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included
Other Batteries	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included
Tires	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included
Cardboard	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Office Paper	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included
White Goods	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included
Scrap Metal	N/A	11 tons	$9.35 cwt	20 tons	Seattle/Bellingham	included	included

(1) Material types may be commingled in the container.
(2) Ferry system regulations prohibit Lynden from transporting HHW and waste oil.
(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.
(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination. Containers must be emptied the same day as delivery.

Lynhaine.wk3

PORT OF ORIGIN: JUNEAU

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: LYNDEN TRANSPORT
550 South Franklin St
Juneau, AK 99801
(907) 586-6600
Kathleen Cambell
(206) 575-9575
Bob Sandberg

SCHEDULE: Lynden Transport works with Alaska Marine Highway System (AMHS) in transporting materials to to Seattle and Bellingham. Service is at least once a week and based on AMHS' departure schedule.

CONTAINER SIZE: 27 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE/ BELLINGHAM SPOT (4)
Aluminum	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Auto Bodies	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Auto Batteries	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Other Batteries	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Tires	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Cardboard	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Office Paper	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
White Goods	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Scrap Metal	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included

(1) Material types may be commingled in the container.
(2) Ferry system regulations prohibit Lynden from transporting HHW and waste oil.
(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.
(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination. Containers must be emptied the same day as delivery.

Lynjun.wk3

PORT OF ORIGIN: JUNEAU

BARGE LINE: ALASKA MARINE LINES, INC.
PO Box 24348
Seattle, WA 98124
(206) 763-4244
(800) 950-4265

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

SCHEDULE: Service from Juneau is at least once a week.

CONTAINER SIZE: 20 FEET

MATERIALS	ITEM #	LCL PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	JUNEAU SPOT (4)	SEATTLE SPOT (3) (5)
Aluminum	7080	4.36 cwt	5 tons	$2.63 cwt	21 tons	Seattle	$50	$42
Auto Bodies	7685	N/A	AQ	$347 (20' platform)	21 tons	Seattle	$50	$42
Auto Batteries	7680	$4.36 cwt	9 tons	$3.15 cwt	21 tons	Seattle	$50	$42
Other Batteries	7680	$4.36 cwt	9 tons	$3.15 cwt	21 tons	Seattle	$50	$42
Tires	7700	$9.29 cwt	6 tons	$5.62 cwt	21 tons	Seattle	$50	$42
Cardboard	7565	$4.63 cwt	10 tons	$1.74 cwt	21 tons	Seattle	$50	$42
HHW	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	7565	$4.63 cwt	10 tons	$1.74 cwt	21 tons	Seattle	$50	$42
White Goods	0100	$4.36 cwt	9 tons	$3.15 cwt	21 tons	Seattle	$50	$42
Scrap Metal	7680	$4.36 cwt	9 tons	$3.15 cwt	21 tons	Seattle	$50	$42

(1) Minimum charge per shipment is $32.

(2) Rates are subject to change after 11/30/91. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(3) Delivery to Kent is $58.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

juneauam.wk3

PORT OF ORIGIN: JUNEAU

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any Quantity

BARGE LINE: AK–PACIFIC BARGE LINES
765 South Myrtle
Seattle, WA 98108
(206) 763–2766
(907) 586–6885

SCHEDULE: AK–Pacific leaves Juneau on Monday evenings. Containers must be delivered by Monday morning.

CONTAINER SIZE: 20 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	JUNEAU SPOT (5)	SEATTLE SPOT (6)
Aluminum	N/A	5 tons +	$2.63 cwt	20 tons	Seattle	$85	$75 +
Auto Bodies	N/A	20' platform	$452 each	20 tons	Seattle	$85	$75 +
		24' platform	$475 each	22 tons	Seattle		
		40' platform	$575 each	23 tons	Seattle		
SCRAP INCLUDING: Auto Batteries, White Goods, Scrap Metal, Other Batteries							
		9 tons +	$3.01 cwt		Seattle	$85	$75 +
		13 tons +	$2.47 cwt		Seattle	$85	$75 +
		16 tons +	$1.89 cwt		Seattle	$85	$75 +
		18 tons +	$1.77 cwt		Seattle	$85	$75 +
		19 tons +	$1.70 cwt	20 tons	Seattle	$85	$75 +
Tires	N/A	5 tons	$4.93 cwt	20 tons	Seattle	$85	$75 +
Cardboard	N/A	10 tons	$1.70 cwt	20 tons	Seattle	$85	$75 +
HHW (2)	N/A	10 tons	$15.05 cwt		Seattle	(3)	(3)
		20 tons	$9.32 cwt	20 tons	Seattle	(3)	(3)
Waste Oil	N/A	12 tons	$4.43 cwt		Seattle	$85	$75 +
		16 tons	$3.92 cwt	20 tons	Seattle	$85	$75 +
		5,000 gal tank(4)	$927 each		Seattle	$85	$75 +
Office Paper	N/A	10 tons	$1.70 cwt	20 tons	Seattle	$85	$75 +

(1) Materials may be commingled in containers, prices based on material weight proportions.

(2) Hazardous waste must be in sealed drums.

(3) Transport for Hazardous Products requires a permitted carrier and rates would be quoted to the final destination by the permited carrier.

(4) Tank is shipper owned. Empty tank return rate included in the price.

(5) The fee charged by a barge line to deliver, drop–off and pickup a container to and from the point of loading.

(6) The fee charged by a barge line to deliver, drop–off and pickup a container to and from the end destination.

Juneauak.wk3

PORT OF ORIGIN: KETCHIKAN

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: LYNDEN TRANSPORT
550 South Franklin St
Juneau, AK 99801
(907) 586-6600
Kathleen Cambell
(206) 575-9575
Bob Sandberg

SCHEDULE: Lynden Transport works with Alaska Marine Highway System (AMHS) in transporting materials to to Seattle and Bellingham. Service is at least once a week and based on AMHS' departure schedule.

CONTAINER SIZE: 27 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE/ BELLINGHAM SPOT (4)
Aluminum	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included
Auto Bodies	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included
Auto Batteries	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included
Other Batteries	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included
Tires	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included
Cardboard	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Office Paper	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included
White Goods	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included
Scrap Metal	N/A	11 tons	$5.09 cwt	20 tons	Seattle/Bellingham	included	included

(1) Material types may be commingled in the container.
(2) Ferry system regulations prohibit Lynden from transporting HHW and waste oil.
(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.
(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination. Containers must be emptied the same day as delivery.

Lynketch.wk3

PORT OF ORIGIN: KETCHIKAN

BARGE LINE: ALASKA MARINE LINES, INC.
PO Box 24348
Seattle, WA 98124
(206) 763-4244
(800) 950-4265

SCHEDULE: Service from Ketchikan is at least twice a week.

CONTAINER SIZE: 20 FEET

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

MATERIALS	ITEM #	LCL PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	KETCHIKAN SPOT (4)	SEATTLE SPOT (3) (5)
Aluminum	7080	3.77 cwt	5 tons	$2.56 cwt	21 tons	Seattle	$50	$42
Auto Bodies	7685	N/A	AQ	$347 (20' platform)	21 tons	Seattle	$50	$42
Auto Batteries	7680	$3.77 cwt	10 tons	$2.53 cwt	21 tons	Seattle	$50	$42
Other Batteries	7680	$3.77 cwt	10 tons	$2.53 cwt	21 tons	Seattle	$50	$42
Tires	7700	N/A	AQ	$3.02 cwt	21 tons	Seattle	$50	$42
Cardboard	7565	$3.81 cwt	9 tons	2.95 cwt	21 tons	Seattle	$50	$42
HHW	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	7565	$3.81 cwt	9 tons	2.95 cwt	21 tons	Seattle	$50	$42
White Goods	0100	$3.77 cwt	10 tons	$2.53 cwt	21 tons	Seattle	$50	$42
Scrap Metal	7680	$3.77 cwt	10 tons	$2.53 cwt	21 tons	Seattle	$50	$42

(1) Minimum charge per shipment is $32.

(2) Rates are subject to change after 11/30/91. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(3) Delivery to Kent is $58.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

ketchaml.wk3

PORT OF ORIGIN KETCHIKAN

BARGE LINE: BOYER BARGE
7318 4th Ave. South, Seattle WA 98108
(206) 763-8575
(907) 225-2093

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any Quantity

Schedule: Boyer sails every Wednesday out of Ketchikan. Containers must be delivered one day before departure.

CONTAINER SIZE: 20 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	KETCHIKAN SPOT (3)	SEATTLE SPOT (4)
Aluminum	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Auto Bodies	N/A	N/A	$264.72 (20' platform)	20 tons	Seattle	$55	$75 +
Auto Batteries	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Other Batteries	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Tires	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Cardboard	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Office Paper	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
White Goods	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Scrap Metal	N/A	AQ up to 8.6 tons 8.6 tons plus	$325 each $1.83 cwt	8.6 tons 20 tons	Seattle	$55	$75 +

(1) Material types may be commingled in a container.

(2) Boyer indicated that they may be willing to look into the shipment of HHW in the future.

(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Ketchboy.wk3

PORT OF ORIGIN: PETERSBURG

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: LYNDEN TRANSPORT
550 South Franklin St
Juneau, AK 99801
(907) 586-6600
Kathleen Cambell
(206) 575-9575
Bob Sandberg

SCHEDULE: Lynden Transport works with Alaska Marine Highway System (AMHS) in transporting materials to to Seattle and Bellingham. Service is at least once a week and based on AMHS' departure schedule.

CONTAINER SIZE: 27 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE/ BELLINGHAM SPOT (4)
Aluminum	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Auto Bodies	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Auto Batteries	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Other Batteries	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Tires	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Cardboard	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Office Paper	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
White Goods	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Scrap Metal	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included

(1) Material types may be commingled in the container.
(2) Ferry system regulations prohibit Lynden from transporting HHW and waste oil.
(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.
(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination. Containers must be emptied the same day as delivery.

Lynpeter.wk3

PORT OF ORIGIN: PETERSBURG

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: NORTHLAND SERVICES INC.
601 S. Myrtle St.
P.O. Box 24527
(206) 763 - 3000

SCHEDULE: Northland provides barge service to Petersburg only in the summer months. Service dates vary in relation to demand.

CONTAINER SIZE: 20 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	PETERSBURG SPOT (3)	SEATTLE SPOT (4)
Aluminum	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+
Auto Bodies	N/A	AQ	$572 each (24' platform)	21 tons	Seattle	$50+	$50+
Auto Batteries	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+
Other Batteries	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+
Tires	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cardboard	N/A	9 tons	$3.70 cwt	21 tons	Seattle	$50+	$50+
HHW (2)	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil (2)	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	N/A	9 tons	$3.70 cwt	21 tons	Seattle	$50+	$50+
White Goods	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+
Scrap Metal	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+

(1) Rates are subject to change without notice. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(2) Rates are dock to dock. Containers must be picked up by a permitted carrier.

(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Petsport.wk3

PORT OF ORIGIN: PETERSBURG

BARGE LINE: ALASKA MARINE LINES, INC.
PO Box 24348
Seattle, WA 98124
(206) 763-4244
(800) 950-4265

SCHEDULE: Service from Petersburg is at least twice a week.

CONTAINER SIZE: 20 FEET

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

MATERIALS	ITEM #	LCL PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	PETERSBURG SPOT (4)	SEATTLE SPOT (3) (5)
Aluminum	7080	$4.04 cwt	5 tons	$2.83 cwt	21 tons	Seattle	$50	$42
Auto Bodies	7685	N/A	AQ	$347 (20' platform)	21 tons	Seattle	$50	$42
Auto Batteries	7680	$4.36 cwt	10 tons	$2.90 cwt	21 tons	Seattle	$50	$42
Other Batteries	7680	$4.36 cwt	10 tons	$2.90 cwt	21 tons	Seattle	$50	$42
Tires	7700	N/A	AQ	$3.45 cwt	21 tons	Seattle	$50	$42
Cardboard	7565	$4.39 cwt	9 tons	$3.70 cwt	21 tons	Seattle	$50	$42
HHW	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	7565	$4.39 cwt	9 tons	$3.70 cwt	21 tons	Seattle	$50	$42
White Goods	0100	$4.36 cwt	10 tons	$2.90 cwt	21 tons	Seattle	$50	$42
Scrap Metal	7680	$4.36 cwt	10 tons	$2.90 cwt	21 tons	Seattle	$50	$42

(1) Minimum charge per shipment is $32.

(2) Rates are subject to change after 11/30/91. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(3) Delivery to Kent is $58.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Petersam.wk3

PORT OF ORIGIN: SITKA

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: LYNDEN TRANSPORT
550 South Franklin St
Juneau, AK 99801
(907) 586-6600
Kathleen Cambell
(206) 575-9575
Bob Sandberg

SCHEDULE: Lynden Transport works with Alaska Marine Highway System (AMHS) in transporting materials to to Seattle and Bellingham. Service is at least once a week and based on AMHS' departure schedule.

CONTAINER SIZE: 27 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE/ BELLINGHAM SPOT (4)
Aluminum	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included
Auto Bodies	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included
Auto Batteries	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included
Other Batteries	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included
Tires	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included
Cardboard	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Office Paper	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included
White Goods	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included
Scrap Metal	N/A	11 tons	$6.68 cwt	20 tons	Seattle/Bellingham	included	included

(1) Material types may be commingled in the container.
(2) Ferry system regulations prohibit Lynden from transporting HHW and waste oil.
(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.
(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination. Containers must be emptied the same day as delivery.

Lynsitka.wk3

PORT OF ORIGIN: SITKA

BARGE LINE: NORTHLAND SERVICES INC.
601 S. Myrtle St.
P.O. Box 24527
(206) 763-3000

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

SCHEDULE: Yearly service is provided, but service dates vary in relation to demand.

CONTAINER SIZE: 20 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE SPOT (4)
Aluminum	N/A	10 tons	$2.91 cwt	21 tons	Seattle	$50+	$50+
Auto Bodies	N/A	AQ	$572 each (24' platform)	21 tons	Seattle	$50+	$50+
Auto Batteries	N/A	10 tons	$2.91 cwt	21 tons	Seattle	$50+	$50+
Other Batteries	N/A	10 tons	$2.91 cwt	21 tons	Seattle	$50+	$50+
Tires	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cardboard	N/A	9 tons	$4.07 cwt	21 tons	Seattle	$50+	$50+
HHW (2)	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil (2)	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	N/A	9 tons	$4.07 cwt	21 tons	Seattle	$50+	$50+
White Goods	N/A	10 tons	$2.91 cwt	21 tons	Seattle	$50+	$50+
Scrap Metal	N/A	10 tons	$2.91 cwt	21 tons	Seattle	$50+	$50+

(1) Rates are subject to change without notice. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(2) Rates are dock to dock. Containers must be picked up by a permitted carrier.

(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Sitnorth.wk3

PORT OF ORIGIN: SITKA

BARGE LINE: ALASKA MARINE LINES, INC.
PO Box 24348
Seattle, WA 98124
(206) 763-4244
(800) 950-4265

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

SCHEDULE: Service from Sitka is at least once a week.

CONTAINER SIZE: 20 FEET

MATERIALS	ITEM #	LCL PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (4)	SEATTLE SPOT (3) (5)
Aluminum	7080	N/A	AQ	$7.41 cwt	21 tons	Seattle	$50	$42
Auto Bodies	7685	N/A	AQ	$420 (20' platform) $572 (24' platform)	21 tons 23 tons	Seattle	$50	$42
Auto Batteries	7680	$5.37 cwt	9 tons	$2.91 cwt	21 tons	Seattle	$50	$42
Other Batteries	7680	$5.37 cwt	9 tons	$2.91 cwt	21 tons	Seattle	$50	$42
Tires	7700	$9.35 cwt	6 tons	$5.99 cwt	21 tons	Seattle	$50	$42
Cardboard	7565	$4.62 cwt	9 tons	$4.07 cwt	21 tons	Seattle	$50	$42
HHW	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	7565	$4.62 cwt	9 tons	$4.07 cwt	21 tons	Seattle	$50	$42
White Goods	0100	$5.37 cwt	9 tons	$2.91 cwt	21 tons	Seattle	$50	$42
Scrap Metal	7680	$5.37 cwt	9 tons	$2.91 cwt	21 tons	Seattle	$50	$42

(1) Minimum charge per shipment is $32.

(2) Rates are subject to change after 11/30/91. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(3) Delivery to Kent is $58.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Sitkaamt.wk3

PORT OF ORIGIN: SITKA

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: SAMSON TUG AND BARGE LINES, INC.
6702 West Marginal Way SW
Seattle, WA 98106
(206) 767-7820
(907) 747-3020

SCHEDULE: Samson Tug and Barge sails from Sitka on an average of once a week. Containers must be delivered at least one day prior to departure.

CONTAINER SIZE: 20 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE SPOT (4)
Aluminum	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
Auto Bodies	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Auto Batteries	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
Other Batteries	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
Tires	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
Cardboard	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
HHW (2)	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
Waste Oil	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
Office Paper	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
White Goods	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55
Scrap Metal	N/A	AQ	$1,150 each	21 tons	Seattle	$103	$55

(1) Samson has a flat rate for each material. If five or more containers are shipped the rate decreases to $1,040 each. Material types may be commingled in the container.

(2) HHW requires a lab report, Samson will not handle material containing PCB's.

(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Sitkasam.wk3

PORT OF ORIGIN: SKAGWAY

BARGE LINE: LYNDEN TRANSPORT
550 South Franklin St
Juneau, AK 99801
(907) 586-6600
Kathleen Cambell
(206) 575-9575
Bob Sandberg

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

SCHEDULE: Lynden Transport works with Alaska Marine Highway System (AMHS) in transporting materials to to Seattle and Bellingham. Service is at least once a week and based on AMHS' departure schedule.

CONTAINER SIZE: 27 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE/ BELLINGHAM SPOT (4)
Aluminum	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included
Auto Bodies	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included
Auto Batteries	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included
Other Batteries	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included
Tires	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included
Cardboard	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Office Paper	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included
White Goods	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included
Scrap Metal	N/A	11 tons	$9.36 cwt	20 tons	Seattle/Bellingham	included	included

(1) Material types may be commingled in the container.
(2) Ferry system regulations prohibit Lynden from transporting HHW and waste oil.
(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.
(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination. Containers must be emptied the same day as delivery.

Lynskag.wk3

PORT OF ORIGIN: SKAGWAY

BARGE LINE: ALASKA MARINE LINES, INC.
PO Box 24348
Seattle, WA 98124
(206) 763-4244
(800) 950-4265

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

SCHEDULE: Service from Skagway is at least once a week.

CONTAINER SIZE: 20 FEET

MATERIALS	ITEM #	LCL PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SKAGWAY SPOT (4)	SEATTLE SPOT (3) (5)
Aluminum	7080	6.84 cwt	5 tons	$4.62 cwt	21 tons	Seattle	$50	$42
Auto Bodies	7685	N/A	AQ	$800 (20' platform)	21 tons	Seattle	$50	$42
Auto Batteries	7680	$6.26 cwt	9 tons	$4.60 cwt	21 tons	Seattle	$50	$42
Other Batteries	7680	$6.26 cwt	9 tons	$4.60 cwt	21 tons	Seattle	$50	$42
Tires	7700	$9.67 cwt	6 tons	$6.25 cwt	21 tons	Seattle	$50	$42
Cardboard	7565	$6.96 cwt	9 tons	4.56 cwt	21 tons	Seattle	$50	$42
HHW	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	7565	$6.96 cwt	9 tons	4.56 cwt	21 tons	Seattle	$50	$42
White Goods	0100	$6.26 cwt	9 tons	$4.60 cwt	21 tons	Seattle	$50	$42
Scrap Metal	7680	$6.26 cwt	9 tons	$4.60 cwt	21 tons	Seattle	$50	$42

(1) Minimum charge per shipment is $32.

(2) Rates are subject to change after 11/30/91. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(3) Delivery to Kent is $58.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Skagway.wk3

PORT OF ORIGIN: SKAGWAY

BARGE LINE: WHITE PASS ALASKA
PO Box 86190
North Vancouver, B.C.
Canada, V7L 4J9
(604) 984-9561

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

Schedule: White Pass Alaska departs Wrangell every second week.

CONTAINER SIZE: 25 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SKAGWAY SPOT (4)(5)	VANCOUVER SPOT (6)
Aluminum	N/A	AQ	$1,500 (Canadian)	20 tons	Vancouver	?	Included
Auto Bodies	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Auto Batteries (2)	N/A	AQ	$1,500 (Canadian)	20 tons	Vancouver	?	Included
Other Batteries	N/A	AQ	$1,500 (Canadian)	20 tons	Vancouver	?	Included
Tires	N/A	AQ	$1,500 (Canadian)	20 tons	Vancouver	?	Included
Cardboard	N/A	AQ	$1,500 (Canadian)	20 tons	Vancouver	?	Included
HHW (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil	N/A	AQ	$1,500 (Canadian)	20 tons	Vancouver	?	Included
Office Paper	N/A	AQ	$1,500 (Canadian)	20 tons	Vancouver	?	Included
White Goods	N/A	AQ	$1,500 (Canadian)	20 tons	Vancouver	?	Included
Scrap Metal	N/A	AQ	$1,500 (Canadian)	8.6 tons	Vancouver	?	Included

(1) Shipped goods must be consigned to destinations in Canada. Materials can be commingled in a container.

(2) Lead-acid batteries must be drained and washed.

(3) White Pass is not interested in handling HHW at this point.

(4) Importing to Canada requires the use of a customs broker for container clearance. Depending on material(s), fees are between $50 - $100 per container.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(6) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Skagwhit.wk3

PORT OF ORIGIN: WRANGELL

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: LYNDEN TRANSPORT
550 South Franklin St
Juneau, AK 99801
(907) 586-6600
Kathleen Cambell
(206) 575-9575
Bob Sandberg

SCHEDULE: Lynden Transport works with Alaska Marine Highway System (AMHS) in transporting materials to to Seattle and Bellingham. Service is at least once a week and based on AMHS' departure schedule.

CONTAINER SIZE: 27 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	SITKA SPOT (3)	SEATTLE/ BELLINGHAM SPOT (4)
Aluminum	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Auto Bodies	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Auto Batteries	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Other Batteries	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Tires	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Cardboard	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Office Paper	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
White Goods	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included
Scrap Metal	N/A	11 tons	$5.95 cwt	20 tons	Seattle/Bellingham	included	included

(1) Material types may be commingled in the container.
(2) Ferry system regulations prohibit Lynden from transporting HHW and waste oil.
(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.
(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination. Containers must be emptied the same day as delivery.

Lynwrang.wk3

PORT OF ORIGIN: WRANGELL

BARGE LINE: NORTHLAND SERVICES INC.
601 S. Myrtle St.
P.O. Box 24527
(206) 763-3000

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

SCHEDULE: Northland provides barge service to Wrangell only in the summer months. Service dates vary in relation to demand.

CONTAINER SIZE: 20 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	WRANGELL SPOT (3)	SEATTLE SPOT (4)
Aluminum	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+
Auto Bodies	N/A	AQ	$572 each (24' platform)	21 tons	Seattle	$50+	$50+
Auto Batteries	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+
Other Batteries	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+
Tires	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cardboard	N/A	9 tons	$3.70 cwt	21 tons	Seattle	$50+	$50+
HHW (2)	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil (2)	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	N/A	9 tons	$3.70 cwt	21 tons	Seattle	$50+	$50+
White Goods	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+
Scrap Metal	N/A	10 tons	$2.90 cwt	21 tons	Seattle	$50+	$50+

(1) Rates are subject to change without notice. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(2) Rates are dock to dock. Containers must be picked up by a permitted carrier.

(3) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

wrangort.wk3

PORT OF ORIGIN: WRANGELL

BARGE LINE: ALASKA MARINE LINES, INC.
PO Box 24348
Seattle, WA 98124
(206) 763-4244
(800) 950-4265

SCHEDULE: Service from Wrangell is at least once a week.

CONTAINER SIZE: 20 FEET

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

MATERIALS	ITEM #	LCL PRICE (1)	MINIMUM FCL WEIGHT	FCL PRICE (2)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	WRANGELL SPOT (4)	SEATTLE SPOT (3) (5)
Aluminum	7080	$4.04 cwt	5 tons	$2.83 cwt	21 tons	Seattle	$50	$42
Auto Bodies	7685	N/A	AQ	$347 (20' platform)	21 tons	Seattle	$50	$42
Auto Batteries	7680	$4.36 cwt	10 tons	$2.90 cwt	21 tons	Seattle	$50	$42
Other Batteries	7680	$4.36 cwt	10 tons	$2.90 cwt	21 tons	Seattle	$50	$42
Tires	7700	N/A	AQ	$3.45 cwt	21 tons	Seattle	$50	$42
Cardboard	7565	$4.39 cwt	9 tons	$3.70 cwt	21 tons	Seattle	$50	$42
HHW	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Waste Oil	2535	N/A	10 tons 20 tons	$15.05 cwt $9.32 cwt	21 tons	Seattle	N/A	N/A
Office Paper	7565	$4.39 cwt	9 tons	$3.70 cwt	21 tons	Seattle	$50	$42
White Goods	0100	$4.36 cwt	10 tons	$2.90 cwt	21 tons	Seattle	$50	$42
Scrap Metal	7680	$4.36 cwt	10 tons	$2.90 cwt	21 tons	Seattle	$50	$42

(1) Minimum charge per shipment is $32.

(2) Rates are subject to change after 11/30/91. Material types may be mixed in the container. Mixed load prices will depend on weights of materials shipped.

(3) Delivery to Kent is $58.

(4) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Wrangaml.wk3

PORT OF ORIGIN: WRANGELL

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

BARGE LINE: WHITE PASS ALASKA
PO Box 86190
North Vancouver, B.C.
Canada, V7L 4J9
(604) 984-9561

Schedule: White Pass Alaska departs Wrangell every second Monday.

CONTAINER SIZE: 20 FEET

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	WRANGELL SPOT (4)(5)	VANCOUVER SPOT (6)
Aluminum	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included
Auto Bodies	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Auto Batteries (2)	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included
Other Batteries	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included
Tires	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included
Cardboard	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included
HHW (3)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included
Office Paper	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included
White Goods	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included
Scrap Metal	N/A	AQ	$1,295 (Canadian)	20 tons	Vancouver	Included	Included

(1) Shipped goods must be consigned to destinations in Canada. Material types may be commingled in the container.

(2) Lead-acid batteries must be drained and washed.

(3) White Pass is not interested in handling HHW at this point.

(4) Importing to Canada requires the use of a customs broker for container clearance. Depending on material(s), fees are between $50 - $100 per container.

(5) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the point of loading.

(6) The fee charged by a barge line to deliver, drop-off and pickup a container to and from the end destination.

Wrangwhi.wk3

PORT OF ORIGIN: WRANGELL

BARGE LINE: BOYER BARGE
7318 4th Ave. South, Seattle WA 98108
(206) 763 – 8575
(907) 225 – 2093

Schedule: Boyer sails every Tuesday out of Wrangell. Containers must be delivered one day before departure.

CONTAINER SIZE: 20 FEET

LCL = Less than container load
FCL = Full container load
CL = Container load
cwt = Per 100 pounds
N/A = Not applicable
AQ = Any quantity

MATERIALS	LCL PRICE	MINIMUM FCL WEIGHT	FCL PRICE (1)	MAXIMUM CL WEIGHT	PORT OF DESTINATION	WRANGELL SPOT (3)	SEATTLE SPOT (4)
Aluminum	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Auto Bodies	N/A	N/A	$291.19 (20' platform)	20 tons	Seattle	$55	$75 +
Auto Batteries	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Other Batteries	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Tires	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Cardboard	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
HHW (2)	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Waste Oil	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Office Paper	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
White Goods	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +
Scrap Metal	N/A	AQ up to 8.6 tons 8.6 tons plus	$355 each $1.90 cwt	8.6 tons 20 tons	Seattle	$55	$75 +

(1) Material types may be commingled in a container.

(2) Boyer indicated that they may be willing to look into the shipment of HHW in the future.

(3) The fee charged by a barge line to deliver, drop–off and pickup a container to and from the point of loading.

(4) The fee charged by a barge line to deliver, drop–off and pickup a container to and from the end destination.

Wrangboy wk3

A4: Information on Markets for Recyclable Materials

- Table summarizing revenue offered
- Market trends
- Market specifications
- List of buyers
- Range of revenue offered by each buyer
- Requirements for market preparation
- Requirements for storage in shipping containers
- Glossary of terms

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SUMMARY OF THE REVENUE (PER TON) OFFERED FOR RECYCLABLE MATERIALS BY BUYERS IN SEATTLE (WA), BELLINGHAM (WA), AND VANCOUVER (B.C.)

RECYCLABLE MATERIAL	LOCATION OF BUYER		
	Seattle, WA	Bellingham, WA	Vancouver, BC
1. Aluminum	$400 - $800	$300 - $650	$350 - $800
2. Auto Batteries	$60 - $90	(no market identified)	$100 - $140
3. Auto Bodies	$25 - $55	($10) - $10	$15 - $55
4. Cardboard	$50 - $75	$25 - $70	$40 - $70
5. Office Paper	$90 - $135	$50 - $70	$50 - $130
6. Scrap Metal	$25 - $70	$10 - $40	$30 - $70
7. Tires	($91.85) - $0	(no market identified)	($83.50) - ($83.50)
8. White Goods	$15 - $30	(no market identified)	$10 - $35

Parentheses ( ) indicate a negative value.

Refer to the accompanying document which provides: (1) names and phone numbers of markets (buyers) in Seattle, Bellingham, and Vancouver; (2) trends in the market prices offered for recyclable materials; (3) requirements for preparation of materials for market; and (4) requirements for storage of materials in shipping containers.

MATERIAL: ALUMINUM CANS/SCRAP

MARKET TRENDS:

Aluminum cans and scrap are recycled into new aluminum products. The price of aluminum has increased substantially in the last 20 years, but prices have recently declined. The available supply appears to be the only constraint to additional recycling of used aluminum beverage containers and scrap. The market will continue to be healthy for the foreseeable future. Prices for Aluminum beverage containers and scrap have ranged between $400 - $1000 per ton over the past five years. Prices are subject to frequent fluctuations.

MARKET SPECIFICATIONS:

While specifications vary based on market preparation, old aluminum cans and scrap must be free of iron, dirt, and other foreign contaminations.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
SEATTLE IRON & METAL 2955 11th Ave SW Seattle, WA 98134 (206) 682-0040 Alan Sidell	Seattle	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes (subtracted from door price)	$400 - $800 a ton
THE PURDY COMPANY 2929 SW Florida St. Seattle, WA 98124 (206) 932-0982	Seattle	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes (subtracted from door price)	$400 - $800 a ton
PUGET SOUND IRON AND METALS 2955 11th SW Seattle, WA 98134 (206) 767-5178 Frank Journey	Seattle	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes (subtracted from door price)	$400 - $800 a ton
PACIFIC IRON AND METALS 2230 4th Ave South Seattle, WA 98134 (206) 628-6232 Al Silva	Seattle	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes (subtracted from door price)	$400 - $800 a ton
PAPER FIBRES 98 S. Hanford Seattle, WA 98134 (206) 622-1981	Seattle	?	?	?	?
WEYERHAEUSER 1962 77th Ave Kent, WA 98032 (206) 662-1035 Tom Baranowski	Seattle	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes (subtracted from door price)	$400 - $800 a ton
INTERNATIONAL PAPER INDUSTRIES LTD. 132 Riverside Drive North Vancouver, B.C. Canada V7H 1T8 (604) 929-7377 Emmie Leung	Vancouver	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes (subtracted from door price)	$400 - $800 a ton
PACIFIC METALS 8380 ONTARIO ST Vancouver, B.C. Canada, V5X 3E5 (604) 327-1146 Joel Lotzker	Vancouver	Loose or baled, free of contaminants	Intact bales, or full gaylords	no	$400 - $800 a ton
ABC RECYCLING 8061 Meadow Ave Burnaby, B.C. Canada, V3N 2V9	Vancouver	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes (subtracted from door price)	$350 - $750 a ton
SKAGIT RIVER STEEL AND RECYCLING PO Box 378 Burlington, WA 98223 (800) 669-7097	Bellingham	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes (if on flatbed)	$350 - $650 a ton
N.W RECYCLING INC. PO Box R Bellingham, WA 98227 (206) 384-6313 Brian Parberry	Bellingham	Loose or baled, free of contaminants	Intact bales, or full gaylords	yes	$300 - $800 a ton

(1) The price range is reflective of the quantity and quality of materials, as well as daily market fluctuations.

MATERIAL: AUTOMOBILE BODIES

MARKET TRENDS:
Markets for auto bodies are currently marginal. Prices fluctuate with general economic conditions. Prices for auto Bodies have fluctuated between $20 and $75 over the past several years. Auto bodies are recycled into new ferrous products.

MARKET SPECIFICATIONS:
Market specifications vary by contracted market. Generally, tires and batteries must be removed. Holes must also be drilled in the gas tank. Shipping economics will necessitate the crushing of car hulks.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE ON PLATFORM	PICK UP AT DOCK	REVENUE RANGE (1)
SEATTLE IRON & METAL 2955 11th Ave SW Seattle, WA 98134 (206) 682-0040 Alan Sidell	Seattle	Car hulks should be crushed, gas tanks should be removed, tires and batteries should also be removed.		yes (subtracted from door price)	$25 - $55 a ton
THE PURDY COMPANY 2929 SW Florida St. Seattle, WA 98124 (206) 932-0992	Seattle	Have recently stopped taking auto bodies.			
PUGET SOUND IRON AND METALS 2955 11th SW Seattle, WA 98134 (206) 767-5179 Frank Journey	Seattle	Car hulks should be crushed, gas tanks should be removed, tires and batteries should also be removed.		yes (subtracted from door price)	$25 - $55 a ton
PACIFIC METALS 8360 ONTARIO ST Vancouver, B.C. Canada, V5X 3E5 (604) 327-1148 Joel Lotzker	Vancouver	Car hulks should be crushed, gas tanks should be punctured, tires and batteries should also be removed.		no	$25 - $55 a ton
ABC RECYCLING 8081 Meadow Ave Burnaby, B.C. Canada, V3N 2V9	Vancouver	Car hulks should be crushed, gas tanks should be punctured, tires and batteries should also be removed.		yes (subtracted from door price)	$15 - $30 a ton
SKAGIT RIVER STEEL AND RECYCLING PO Box 376 Burlington, WA 98223 (800) 869-7097	Bellingham	Car hulks should be crushed, gas tanks should be punctured, tires and batteries should also be removed.		yes (if on flatbed)	$(-)10 - $10 a ton

(1) The price range is reflective of the quantity and quality of materials, as well as daily market fluctuations.

Markcar.wk3

MATERIAL: LEAD–ACID BATTERIES

MARKET TRENDS:

Recent financial liability and regulation have made collectors and processors increasingly reluctant to handle lead–acid batteries destined for recycling. Battery processing smelters in the Northwest have closed due to the costs of complying with environmental regulations. The markets for lead–acid batteries is currently overseas, Los Angeles and British Colombia. Prices paid for lead–acid batteries fluctuate with the variations in the virgin lead market. Prices have varied between $60 and $140 over the past five years. The majority of recovered lead is used to produce new lead–acid batteries.

MARKET SPECIFICATIONS:

Market specifications are in accordance with the Coast Guard approved transportation requirements. Batteries must be shipped as follows:

Packed upright, three layers high on a pallet
Waffle cardboard should be placed between each layer
Each layer must be banded
The pallet must be stretch or shrink wrapped
Corrosive stickers must be placed on the side and the top.

If packed correctly, a typical pallet will weigh at least one and one quarter tons.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
INTERSTATE BATTERIES 727 134th St SW Everett, WA 98204 (206) 743–7677 Tom Allen	Seattle	Standard "Coast Guard approved"	Standard "Coast Guard approved"	yes (subtracted from door price)	$60 – $90 a ton
K.C. RECYCLING BOX 398 Trail, B.C. Canada, V1R 4L7 (604) 367–7565 Murray Bayley	Vancouver	Standard "Coast Guard approved" (2)	Standard "Coast Guard approved." 24 ton minimum.	no (3)	$100 – $140 a ton

(1) The price range is reflective of the quantity and quality of materials, as well as daily market fluctuations.

(2) It is necessary to notify K.C. Recyling at least one month prior to shipment, so that they can notify the necessary governmental agencies.

(3) K.C. Reycling will provided transport from Vancouver to their plant, but it would be the shippers responsibility to have the batteries transferred into the truck.

Marklead.wk3

MATERIAL: HOUSEHOLD BATTERIES

MARKET TRENDS:

Markets for alkaline household batteries have not yet been developed in the United States. At this point, there are pilot projects in Switzerland, Japan the Netherlands and several communities on the East Coast of the United States. Environmental Pacific located in Portland, Oregon is the only U.S. company collecting alkaline and mixed batteries for "recycling." Their practice of exporting batteries to developing countries, their unwillingness to provide even general processing information and several recent fines for hazardous waste management violations have made them a questionable market at best.

Household batteries are accepted by hazardous waste handling companies. Currently, the batteries are being landfilled in a hazardous waste landfill.

MARKET SPECIFICATIONS:

Given the various liabilities that exist when handling hazardous waste, the markets provide "turnkey" packages. For a set price, they will provide the storage drums, handle transportation arrangements, and will assure proper disposal of the hazardous material. Markets will also provide HHW collection services, a three day collection program costs between $10,000 to $15,000 plus per drum charges.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
CHEMPRO 2203 Airport Way South Seattle, WA 98134 (206) 243-6776 Trace Graffenstatte	Seattle	Batteries can be commingled with other household hazardous materials. Chempro's price includes drum cost, transportation from collection site, disposal and labor.	Chempro handles transportation arrangements.	N/A	$(-)500 to $(-)1,000 per drum
NORTHWEST ENVIRO SERVICE 1813 E 1st Ave. Anchorage, AK 99501 (907) 272-9007 Larry Wilkinson	Seattle	Batteries can be commingled with other household hazardous materials. NW Enviro Service's price includes drum cost, transportation from collection site, disposal and labor.	NW Enviro Service handles transportation arrangements.	N/A	$(-)500 to $(-)1,000 per drum

(1) The price range is reflective of the quantity and quality of materials, as well as the location of the generating community.

Markbatt.wk3

MATERIAL: WASTE TIRES

MARKET TRENDS:

Currently, there are few end-users of waste tires. The retreading industry uses between 5% - 10% of the recovered tires annually. Tires are also converted into other products and recovered for energy through incineration or fuel production. In the latter two cases the technology to consume large numbers of tires is very expensive and not well established. Markets for car tires are marginal in the Northwest. Large regional stockpiles are coupled with few markets in the area.

MARKET SPECIFICATIONS:

Whole tires must not be contaminated by other materials. Tires must be free of their rims.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
TIRE RECYCLERS INC. 583 North Military Rd Winlock, WA 98596 (800)-828-3961 Don Buss	Seattle	No contamination. No rubbish, rocks or rims. Tires can be whole.	Tires should be banded together in container to maximize weight.	yes (additional charge)	$(-).50 to $ 0 an automibile tire $(-)7.50 a truck tire
RMAC INTERNATIONAL PO BOX 301008 Portland, OR 97230 (503) 252-8316 John Spencer	Seattle	No contamination. No rubbish, rocks or rims. Tires can be whole.	Tires should be banded together in container to maximize weight.	yes (additional charge)	$(-).35 an automobile tire $(-)3.50 a truck tire
WASTE RECOVERY 8501 N Borthwick Portland, OR 97217 (503) 283-2261 Mark Hope	Seattle	No contamination. No rubbish, rocks or rims. Tires can be whole.	Tires should be banded together in container to maximize weight.	no	$(-).55 an automobile tire $(-)3.00 a truck tire
WESTERN RUBBER PRODUCTS 400 Ewen Ave New Westminster, B.C. Canada, V3M 5B1 Bill McCullough	Vancouver	No contamination. No rubbish, rocks or rims. Tires can be whole.	Tires should be banded together in container to maximize weight.	yes	$(-).50 an automobile tire

(1) Price ranges are reflective of the quality of the individual tire.

Marktire.wk3

MATERIAL: CORRUGATED CARDBOARD

MARKET TRENDS:

Demand is strong with prices ranging over the last five years from $40 – $120 per ton. Those prices have weakened in recent years in response to a general slowdown in economic conditions after the mid-1980 expansion. Prices are now stabilizing as new domestic capacity to use OCC comes on line. This very healthy trend is likely to continue in the foreseeable future. In addition, foreign demand is expected to be strong, further strengthening prices. Corrugated cardboard boxes are recycled into new paper products.

MARKET SPECIFICATIONS:

Consists of baled corrugated containers having liners of either test liner, jute or kraft. Prohibitive materials may not exceed 1%. Total outthrows may not exceed 5%.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
PAPER FIBRES 66 S. Hanford Seattle, WA 98134 (206) 622-1991	Seattle	?	?	?	
SMURFIT RECYCLING 9747 Martin Luther King Way S. Seattle, WA 98118 (206) 723-4490 Glen Martin	Seattle	OCC must be baled. OCC only, no kraft bags.	10 tons minimal in container.	yes (subtract $15 a ton)	$50 – $75 a ton (baled)
WEYERHAEUSER 1962 77th Ave Kent, WA 98032 (206) 682-1035 Tom Baranowski	Seattle	Bales must be at least 1/2 ton.	10 tons minimal in container.	yes (subtract $5+ a ton)	$50 – $65 a ton (baled) $25 – $35 a ton (loose)
INTERNATIONAL PAPER INDUSTRIES LTD. 132 Riverside Drive North Vancouver, B.C. Canada V7H 1T9 (604) 929-7377 Emmie Leung	Vancouver	Bales must be at least 1/2 ton.	10 tons minimal in container.	no	$50 – $70 a ton (baled)
CANADIAN FIBRE 3971 Boundary Rd. Richmond, B.C. Canada, V6V 1T8 (604) 524-4627 Lynn Zoumont	Vancouver	Bales must be at least 1/2 ton.		yes (subtracted from door price)	$50 – $70 a ton (baled)
WEYERHAEUSER 9200 Van Horne Way Richmond, B.C. Canada, V6x 1W3 (604) 276-8786 Doug McLaughlan	Vancouver	Bales must be at least 1/2 ton.	10 tons minimal in container.	yes (subtracted from door price)	$40 – $55 a ton (baled)
SKAGIT RIVER STEEL AND RECYCLING PO Box 376 Burlington, WA 98223 (800) 869-7097	Bellingham	Bales must be at least 1/2 ton.		yes (if on flatbed)	$25 – $40 a ton (baled)
N.W. RECYCLING INC. PO Box R Bellingham, WA 98227 (206) 384-6313 Brian Parberry	Bellingham	Bales must be at least 1/2 ton. Gaylords must be full.		yes (subtracted from door price)	$50 – $70 a ton (baled) $30 – $60 a ton (loose)

(1) The price range is reflective of the quantity and quality of materials, as well as daily market fluctuations.

(2) The term "outthrows" is defined as "all papers that are so manufactured or treated or are in such a form as to be unsuitable for consumption as the grade specified.

(3) The term "prohibitive materials" is defined as "any materials which by their presence in a packing of paper stock, in excess of the amount allowed, will make the packaging unusable as the grade specified." It is also used to define any any packaging that may damage equipment.

MATERIAL: HOUSEHOLD HAZARDOUS WASTE

MARKET TRENDS:

In General, household hazardous waste (HHW) is not a salable commodity. Various components of HHW may have markets as an option to disposal as hazardous waste. For instance, usable paints are sometimes given away to the public or special interest groups. Latex paint recycling programs that accept paint generated locally in the Northwest and California have proven less costly than disposal. Oil, oil-based paints and other combustible materials are often disposed of as a fuel. Nearly all handling methods for HHW incur a cost for disposal or diversion. If disposed of as a hazardous waste, a 55-gallon drum (containing approximately 22 gallons of lab-packed waste) may cost from $250 - $1,000.

MARKET SPECIFICATIONS:

Given the various liabilities that exist when handling hazardous waste, the majority of markets provide "turnkey" packages. For a set price, they will provide the storage drums, handle transportation arrangements, and will assure proper disposal of the hazardous material. Markets will also provide HHW collection services, a three day collection program costs between $10,000 to $15,000 plus per drum disposal charges.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
CHEMPRO 2203 Airport Way South Seattle, WA 98134 (206) 243-6776 Trace Graffenstatte	Seattle	Categories of HHW can be commingled or separated. Chempro's price includes drum cost, transportation from collection site, disposal and labor.	Chempro handles transportation arrangements.	N/A	$(-)500 to $(-)1,000 per drum
NORTH WEST ENVIRO SERVICE 1813 E 1st Ave. Anchorage, AK 99501 (907) 272-9007 Larry Wilkinson	Seattle	Categories of HHW can be commingled or separated. Chempro's price includes drum cost, transportation from collection site, disposal and labor. from collection site, disposal and labor.	NW Enviro Service handles transportation arrangements.	N/A	$(-)500 to $(-)1,000 per drum
ALLIED ENVIRONMENTAL SERVICES 4623 Byrn Rd. Burnaby, B.C. Canada, V5J 3H6 (604) 431-8780 Peter Hendrikson	Vancouver	Handle all latex and oil based paints. Paint can be mixed together. A sample must be provided prior to shipment.	Allied requires two month notification period. They will provide manifest and labels for shipping.	yes	$(-)400 per drum (delivered)

(1) The price range is reflective of the quantity and quality of materials, as well as the location of the generating community.

Markhhw.wk3

MATERIAL: WASTE OIL

MARKET TRENDS:

Over two-thirds of the waste oil collected is reprocessed for use as a fuel in industrial boilers or as a bunker fuel for ships. Reprocessed waste oil is 20% to 30% cheaper than virgin burner fuel. Market prices fluctuate with world oil prices. A per gallon fee is often charged to cover reprocessing costs. Market prices vary depending on the quality and quantity of oil.

MARKET SPECIFICATIONS:

Market specifications vary significantly depending on markets. Specific requirements of an individual market must be agreed upon prior to shipment. All markets require prior testing of the oil.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE
PETROLEUM RECLAIMING AND REFINING 3003 Taylor Way Tacoma, WA 98421 (206) 587-6206	Seattle	(1)	DOT approved 55 gallon drums or bulk tanks.	yes (additional charge)	$(-).25 a gallon Drum disposal charges from $.09 to $.45 a gallon.
SPENCER ENVIRONMENTAL SERVICES PO Box 84062 Seattle, WA 98124 (206) 467-7988 Scott Nitschker	Seattle	(2)	DOT approved 55 gallon drums or bulk tanks.	yes	$(-).50 to $.05 a gallon Drum disposal charges from $.09 to $.82 a gallon.
VINTAGE OIL 744 South March Point Rd Anacortes, WA 98221 Frank Pustka	Seattle Bellingham	(3)	DOT approved 55 gallon drums or bulk tanks.	yes (included)	$(-).12 a gallon $(-)3.50 a gallon of sludge. Drum disposal charges from $.09 to $.18 a gallon.
MOHAWK LUBRICANTS LTD. USED OIL COLLECTION 130 Forester Street North Vancouver, B.C. Canada V7H 2M9 (604) 929-1284 Frank McGovern	Vancouver	(4)	DOT approved 55 gallon drums or bulk tanks. Advanced notification of two months required prior to shipping.	yes (additional charge)	$(-).25 to $0 a gallon Drums are returned at additional cost.

(1) Flash points must be above 140. Halogens must be under 1,000 ppm. Tests must be conducted on every third drum at $15 a test. Only one test is required for each tank.

(2) Flash points must be above 200. Must pass TCLP test for 8 metals. Must be free of PCBs. No more than 1,000 ppm total halogens.

(3) Flash points must be above 100. Halogens must be under 1,000 ppm. Must be free of PCB's.

(4) Products that should not be put into containers used for the storage of used lubricating oils destined to be collected for re-refining:

All oils that contain or have been contaminated with Bunker type fuel oils, even though the contamination may be minimal.
Emulsified cutting oils or emulsifiable cutting oils.
Fire retardent oils.
Paint Solvents - all types
Cleaning solvents - 1% by volume, maximum.
Gasoline/Diesel - 1% by volume, maximum.
Aviation Fuels.
Transformer Oils - all types
Synthetic Oils of any type.
Water content - 0% to 10% acceptable - above 10% water content to be discussed and agreed upon.

Markoil.wk3

MATERIAL: WHITE - LEDGER PAPER

MARKET TRENDS:

This category includes printing, copier, writing and computer papers. They have relatively high values compared with other grades. In recent years, prices have ranged from $75 to $300 per ton. Lately, prices have been more stable than for other paper grades, reflecting strong markets with substantial growth potential. Recovered white - ledger paper is recycled into new paper products.

MARKET SPECIFICATIONS:

Consists of printed or unprinted white sheets. This grade must be free of treated, coated, padded, or heavily printed stock. Prohibitive materials may not exceed 1/2 of 1%. (2) Total Outthrows may not exceed 2%. (3)

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
PAPER FIBRES 66 S. Hanford Seattle, WA 98134 (206) 622 - 1991	Seattle	?	?	?	
SMURFIT RECYCLING 9747 Martin Luther King Way S. Seattle, WA 98118 (206) 723 - 4490 Glen Martin	Seattle	Bales must be at least 1/2 ton.	10 tons minimal in container.	yes (subtract $15 a ton)	$90 - $135 a ton (baled)
WEYERHAEUSER 1962 77th Ave Kent, WA 98032 (206) 682 - 1035 Tom Baranowski	Seattle	Bales must be at least 1/2 ton. Gaylords must be full.	10 tons minimal in container.	yes (subtract $5+ a ton)	$90 - $135 a ton (baled) $70 - $100 a ton (loose)
INTERNATIONAL PAPER INDUSTRIES LTD. 132 Riverside Drive North Vancouver, B.C. Canada V7H 1T9 (604) 929 - 7377 Emmie Leung	Vancouver	Bales must be at least 1/2 ton.	10 tons minimal in container.	no	$90 - $130 a ton (baled)
CANADIAN FIBRE 3971 Boundary Rd. Richmond, B.C. Canada, V6V 1T8 (604) 524 - 4627 Lynn Zoumont	Vancouver	Bales must be at least 1/2 ton. Gaylords must be full.		yes (subtracted from door price)	$90 - $120 a ton (baled) $60 - $100 a ton (loose)
WEYERHAEUSER 9200 Van Horne Way Richmond, B.C. Canada, V6X 1W3 (604) 276 - 8786 Doug McLaughlan	Vancouver	Bales must be at least 1/2 ton. Gaylords must be full.	10 tons minimal in container.	yes (subtracted from door price)	$50 - $100 a ton (baled)
SKAGIT RIVER STEEL AND RECYCLING PO Box 376 Burlington, WA 98223 (800) 869 - 7097	Bellingham	Bales must be at least 1/2 ton. Gaylords must be full.		yes (if on flatbed)	$50 - $70 a ton (baled) $25 - $35 a ton (loose)
N.W. RECYCLING INC. PO Box R Bellingham, WA 98227 (206) 384 - 6313 Brian Parberry	Bellingham	Bales must be at least 1/2 ton. Gaylords must be full.		yes (subtracted from door price)	$50 - $70 a ton (baled) $30 - $60 a ton (loose)

(1) The price range is reflective of the quantity and quality of materials, as well as daily market fluctuations.

(2) The term "outthrows" is defined as "all papers that are so manufactured or treated or are in such a form as to be unsuitable for consumption as the grade specified.

(3) The term "prohibitive materials" is defined as "any materials which by their presence in a packing of paper stock, in excess of the amount allowed, will make the packaging unusable as the grade specified." It is also used to define any any packaging that may damage equipment.

MATERIAL: WHITE GOODS

MARKET TRENDS:

Markets for white goods are currently marginal due to high processing costs created by the need to remove hazardous components (e.g. PCBs contained in the electrical components of older appliances). Prices for white goods have varied from $10 to $35 a ton over the past several years. White goods are recycled into new ferrous products.

MARKET SPECIFICATIONS:

The possible presence of PCB's presents a major problem for companies interested in recycling appliances. At issue are appliances which were manufactured before 1979 which contain small capacitors which may have PCB's inside of them. The majority of markets require that capacitors and compressor motors be removed.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
SEATTLE IRON & METAL 2955 11th Ave SW Seattle, WA 98134 (206) 682-0040 Alan Sidell	Seattle	Compressors and capacitors must be removed. Freezers are not accepted.		yes (subtracted from door price)	$15 - $30 a ton
THE PURDY COMPANY 2929 SW Florida St. Seattle, WA 98124 (206) 932-0992	Seattle	No Longer handling white goods			N/A
PUGET SOUNT IRON AND METALS 2955 11th SW Seattle, WA 98134 (206) 767-5179 Frank Journey	Seattle	Compressors must be removed.		yes (subtracted from door price)	$15 - $30 a ton
PACIFIC METALS 8360 ONTARIO ST Vancouver, B.C. Canada, V5X 3E5 (604) 327-1148 Joel Lotzker	Vancouver	Compressors and capacitors must be removed.		no	$20 - $35 a ton
ABC RECYCLING 8081 Meadow Ave Burnaby, B.C. Canada, V3N 2V9	Vancouver	Will accept white goods with capacitors and compressors.		yes (subtracted from door price)	$10 - $30 a ton
SKAGIT RIVER STEEL AND RECYCLING PO Box 376 Burlington, WA 98223 (800) 869-7097	Bellingham	No longer handling white goods.			N/A

(1) The price range is reflective of the quantity and quality of materials, as well as daily market fluctuations.

(2) However, the terms "free of dirt, nonferrous metals, or foreign material of any kind" are not intended to preclude the accidental inclusion of negligible where it can be shown that this amount is unavoidable in the customary preparation and handling of the particular grade involved.

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MATERIAL: SCRAP METAL

MARKET TRENDS:

Metals generally have a much higher weight to volume ratio than other recyclable materials. Markets for most types of scrap metal have been good over the past several years with prices fluctuating between $45 and $100 a ton. Prices fluctuate dramatically in reaction to general economic conditions and prices for virgin feedstock. Scrap metals are recycled into new ferrous products.

MARKET SPECIFICATIONS:

The extent that the scrap metal is reduced in size and separated by material type affects the price paid for scrap metal. Scrap metal can be marketed with little or no preparation, or it can be prepared to fit within a specific category. Unprepared scrap metal is categorized as No. 2 steel.

MARKETS:	PORT LOCATION	REQUIREMENTS FOR MARKET PREPARATION	REQUIREMENTS FOR STORAGE IN CONTAINER	PICK UP AT DOCK	REVENUE RANGE (1)
SEATTLE IRON & METAL 2955 11th Ave SW Seattle, WA 98134 (206) 682-0040 Alan Sidell	Seattle	All grades must be free of dirt, nonferrous metals, or foreign material of any kind, and excessive rust and corrosion. (2)		yes (subtracted from door price)	$40 - $70 a ton
THE PURDY COMPANY 2929 SW Florida St. Seattle, WA 98124 (206) 932-0992	Seattle	All grades must be free of dirt, nonferrous metals, or foreign material of any kind, and excessive rust and corrosion. (2)		yes (subtracted from door price)	$25 - $70 a ton
PUGET SOUND IRON AND METALS 2955 11th SW Seattle, WA 98134 (206) 767-5179 Frank Journey	Seattle	All grades must be free of dirt, nonferrous metals, or foreign material of any kind, and excessive rust and corrosion. (2)			$40 -$70 a ton
PACIFIC METALS 8360 ONTARIO ST Vancouver, B.C. Canada, V5X 3E5 (604) 327-1148 Joel Lotzker	Vancouver	All grades must be free of dirt, nonferrous metals, or foreign material of any kind, and excessive rust and corrosion. (2)		no	$40 - $70 a ton
ABC RECYCLING 8081 Meadow Ave Burnaby, B.C. Canada, V3N 2V9	Vancouver	All grades must be free of dirt, nonferrous metals, or foreign material of any kind, and excessive rust and corrosion. (2)		yes (subtracted from door price)	$30 - $60 a ton
SKAGIT RIVER STEEL AND RECYCLING PO Box 376 Burlington, WA 98223 (800) 869-7097	Bellingham	All grades must be free of dirt, nonferrous metals, or foreign material of any kind, and excessive rust and corrosion. (2)		yes (if on flatbed)	$10 - $40 a ton

(1) The price range is reflective of the quantity and quality of materials, as well as daily market fluctuations.

(2) However, the terms "free of dirt, nonferrous metals, or foreign material of any kind" are not intended to preclude the accidental inclusion of negligible where it can be shown that this amount is unavoidable in the customary preparation and handling of the particular grade involved.

Marksers.wk3

GLOSSARY OF TERMS FOR MARKET INFORMATION

Bale	=	A volume reduction technique where material is mechanically compacted into cubes or bricks and may be held together by wire or steel straps. A standard bale size for container load shipment is 42" x 30" x 92". Bale weight for container load shipment should be at least 1/2 ton.
Door Price	=	The price paid for a specific material delivered to the market location.
Gaylord	=	A reinforced open topped cardboard container used for the storage of loose materials. Standard dimensions are 40" x 48" x 36".
Lab-Packed	=	Hazardous items are placed in a drum in such a way that all items are separated by an absorbent material. The position of each item within a drum and its specific character must be recorded.
Outthrows	=	All papers that are manufactured or treated or are in such a form as to be unsuitable for consumption for the grade specified.
Pallet	=	A wooden or plastic portable platform for handling, storing, or moving materials. Standard dimensions are 40" x 48" x 6".
Prohibitives	=	Any materials which by their presence in a packing of paper stock, in excess of the amount allowed, will make the packaging unusable as the grade specified. It is also used to define any packaging that may damage equipment.
Turnkey	=	The complete handling of a system or material. Includes collection, transportation, and marketing arrangements.

APPENDIX B

WASTE TIRE MANAGEMENT REPORT

WASTE TIRE MANAGEMENT IN SOUTHEAST ALASKA

I. INTRODUCTION

The need to identify waste tire management options that are both environmentally safe and economically feasible is a growing concern for several reasons. First, waste tires are a significant contributor to diminishing landfill capacity. One cubic yard of space is required to landfill only thirteen tires. Second, waste tires interfere with proper landfill management since they tend to rise to the surface and disturb coverings which are intended to control water infiltration and prevent leachate runoff. Finally, there are adverse environmental and health impacts associated with the stockpiling or open burning of waste tires. Tire stockpiles provide habitats for rodents and breeding grounds for mosquitoes. Hazardous by-products may be released when tires are burned in an open setting.

The purpose of this report is to provide southeast communities with a preliminary feasibility assessment of several commonly used waste tire management strategies. This report is not intended to be a comprehensive review of all available management options. Rather, it focuses on uses that appear to be the most appropriate for the region given its high costs of transportation and small volume of scrap tires. The following sections of this report describe the current generation and management of waste tires in southeast Alaska, outline several alternative management strategies, and review regulatory trends.

CURRENT GENERATION AND MANAGEMENT OF WASTE TIRES

Preliminary estimates indicate that, together, southeast communities generate between 25,000 to 60,000 tires annually.[1] The lower bound estimate is based on data supplied by Sitka that places the annual rate of tire generation for the region at approximately .5 tires per person per year. The upper bound figure reflects the national tire generation rate which is one tire per person. A more precise estimate of waste tire generation in southeast Alaska is not possible because most communities do not compile data on waste stream characteristics. Currently, no communities recycle their tires, although some stockpile or segregate waste tires. For example, Skagway stockpiles its waste tires and intends to use them as matting when its landfill is closed. Petersburg segregated tires and planned to sell waste tires to a buyer in Juneau, but the deal collapsed.

Accurate information on tire volumes and characteristics is important in determining which management options are most realistic for the region. For example, in order to be economically feasible, plants to convert whole tires into tire chips are generally designed to process 500 to 1,000 tires per hour.[2] At these rates the region's estimated annual supply of tires would be entirely consumed in less than a week. And, while such facilities may

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[1] Estimates are based on a population of over 56,000 for Skagway, Haines, Juneau, Sitka, Wrangell, Petersburg, Ketchikan, and the Prince of Wales communities.

[2] Washington State Department of Trade and Economic Development Business Assistance Center and Washington State Department of Ecology, Feasibility Study to Site and Operate a Tire Recycling Facility in Washington State, prepared by SCS Engineers and Eco Northwest, January 1989.

operate at less than capacity, they are not likely to be profitable. For example, KACA Corporation in Pierce County produces tire chips and uses an average of 30,000 tires annually, however, this is only about half of what could be produced. The firm basically covers its operating costs but has not yet recovered its investment costs.[3]

Clearly, the region's tire generation rate is a limiting factor in developing in-region waste tire management options. In shipping tires to a tire processor outside of the region, individual communities face disposal costs that range from $91 to $324 per ton. The cost of disposing of tires outside of the region reflects the cost of transportation plus the tipping fee charged by the processor. These costs may be unacceptably high for most communities.

OVERVIEW OF WASTE TIRE MANAGEMENT METHODS

The traditional practice of landfilling whole tires is no longer optimal for the reasons noted above. Alternatives to landfilling which are consistent with the Alaska Department of Environmental Conservation's (ADEC) waste management hierarchy include:

- Reduce waste tire supplies. Tire supplies can be reduced through educational programs that teach motorists about proper tire care and through research and development which is aimed at increasing tire life.

- Recycle waste tires. Waste tires can be recycled to produce many different goods including rubberized asphalt, running tracks, floor mats, gaskets, surface sealers, dock and boat bumpers, railroad crossings, compost and light-weight construction fill.

- Reuse waste tires. Whole waste tires can be reused to build artificial reefs, breakwaters, erosion control barriers, highway barriers, playground equipment, and landscaping structures.

- Process waste tires for energy recovery. Whole tires and tire chips, also know as tire derived fuel (TDF), are a valuable source of energy. Recovery processes include pyrolysis, which involves heating tires to reclaim oil, gas and carbon black, and direct incineration of whole tires and TDF in cement kilns, pulp and paper mills, and utility boilers.

II. WASTE TIRE MANAGEMENT OPTIONS

Several of the most widely used waste tire disposal alternatives are described below to provide an indication of the factors communities should consider in managing tire supplies. A variety of technical, economic, and environmental factors make most options described here less than optimal for the region and are therefore only briefly reviewed. The use of TDF in one of the region's pulp and paper mills appears to be the promising option and is described in some detail. However, all alternative management strategies involve costs

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[3] Ibid.

to the region. Currently, landfilling or shipping tires out of the region for processing appear to be the least expensive options. However, land disposal is likely to become an increasingly costly option as the region's landfills reach capacity.

TIRE DERIVED FUEL USE IN PULP AND PAPER MILLS

TDF is a valuable supplemental fuel source for pulp and paper mills. TDF has a heating value of approximately 14,400 Btu per pound which is equivalent to .75 gallons of oil. TDF also has three times the heating value of wood waste by-products (hogged fuel). To be attractive to mills, the price of TDF must be competitive with other fuel sources. The economics must also be such that mills will invest in the boiler, feed system, and environmental permit modifications that are needed to burn TDF. Usually a metering system must be installed to control the high heat generated when TDF is burned. Also, some type of air pollution control equipment such as acid gas or wet scrubbers, electrostatic precipitation, or baghouse/fabric filters, is required. In most cases, existing boilers can be modified at a relatively low cost and TDF simply mixed with other fuels in a conveyor system that feeds the furnace. Pulp and paper mills require a high-quality TDF that is largely free of metal particles. Poor grade TDF causes jamming in fuel feed systems and produces contaminated ash.

There are two pulp and paper mills in the southeast region (1) the Alaska Pulp Corporation in Sitka and, (2) the Ketchikan Pulp Company in Ketchikan. Both mills were contacted to determine whether they would be interested in burning TDF. The Ketchikan facility currently is not equipped to use TDF in its boilers and mill representatives indicated that making the necessary modifications is not economically feasible at this time. However, the Sitka mill, with relatively minor alterations, can burn TDF and is willing to explore the possibility of using it as a supplemental fuel.

As noted earlier, pulp and paper mills cannot burn whole tires. Therefore, waste tires must first be processed into TDF (tire chips). Given the high capital costs of TDF manufacturing, it is more cost-effective for communities to send their waste tires out of the region for processing. Waste Recovery, Inc. (WRI) in Portland, Oregon produces TDF that is primarily designed for use in pulp and paper mills. The firm indicated it is willing to take tires at a reduced cost to the generator if it can also develop additional markets for its product. Thus, it appears likely that communities would be able to realize substantial savings on the cost of transporting tires to Seattle if the region can provide a market for the finished product.

Cost considerations: The Sitka mill faces moderate costs to upgrade its fuel storage and handling areas. It would also need to obtain the necessary environmental permits. The estimated cost of facility improvements is between $150,000 and $200,000;[4] environmental permit modifications, including trial burns, typically cost $20,000 and $30,000.[5]

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[4] Rollo Pool, Alaska Pulp Corporation, Sitka Alaska, September 4, 1991.

[5] Mark Hope, Waste Recovery, Inc., Portland, Oregon, August 31, 1991.

This option's cost to individual communities will vary somewhat and will depend on what type of shipping arrangement can be negotiated with WRI. One possible scenario is that each community would agree to ship its waste tires to a common location in Sitka and, on a periodic basis, a barge hauling TDF to the Sitka mill would agree to backhaul the region's accumulation of waste tires to Portland at substantially reduced cost. Such an arrangement would be beneficial to individual communities, the region, the mill, the barge operator, and WRI.

Communities would incur transportation costs to ship tires to Sitka, although these costs should be less than the standard cost of shipping tires to Seattle on an individual basis. There would likely still be a fee to transport the region's waste tires from Sitka to Seattle. WRI's willingness to subsidize the cost of transporting the region's tires to Portland for processing will depend on the market value of TDF, the quantity of product the mill can use, the volume of waste tire generated, and the level of regional support and cooperation.

Environmental Impacts: Burning TDF in hog fuel boilers can result in adverse environmental impacts and therefore may be opposed by industry and the public. Increased emission of particulates, zinc, and sulfur have been observed in some instances. Other emissions including polynuclear hydrocarbons (PAHs), SO2 and Nox are similar to, or less than, the emissions associated with burning oil, coal, or wood wastes. In most cases, emission problems can be controlled by limiting the percentage of TDF that is burned (less than 10 percent of the total fuel load), and by appropriate air pollution control equipment.

Poor quality TDF that contains steel tire wire or beads can produce contaminated ash. This problem can be avoided by burning high-quality dewired TDF in which case ash disposal would only need to comply with local landfill regulations. A solid waste management official in Sitka indicated that no changes in the mill's current ash handling and disposal practices would be needed if TDF were used as a fuel.

Implementation Issues: This proposal may need public review, because of concern about potential environmental impacts, and certainly will require ADEC's approval and cooperation. WRI is willing to meet with representatives from ADEC, the mill, and the region to discuss how this proposal might be implemented. The firm feels it can adequately address air toxics concerns and help the mill develop a TDF burning process that is acceptable to all parties.

OTHER TIRE DERIVED PRODUCTS

There are two general approaches for manufacturing products from waste tires. The first approach involves "stamping" rubber products directly out of whole tires or tire casings. The second approach requires that tires be reduced to crumb rubber which is then combined with binders and used in various applications.

Rubber Products: Many parts for boats and fishing gear including bumpers, fenders, and rollers, can be made by cutting items out of flattened tire casings. This process is labor-intensive and does not consume the entire tire; leftover tire pieces must still be disposed of. Also, such products can only be stamped from the fabric reinforced portion of older style bias-ply tires. Steel-belted tires cannot be used. While attractive as a cottage industry, high labor costs may discourage interest in the manufacture of rubber products for the region's fishing industry. This option is also not likely to provide a disposal solution for very many tires.

Reuse in Asphalt Paving: Rubberized asphalt is one of the largest potential uses for waste tires. In this application, waste tires must first be reduced to crumb rubber which is a complex, expensive process. Rubberized asphalt is produced by blending crumb rubber with heated asphalt. Rubber particles usually comprise 15 to 20 percent of the final product which must be used immediately. The use of rubberized asphalt is still in the experimental stage. Advocates claim it is more durable than conventional asphalt but at nearly double the cost. There is also some evidence that hazardous constituents leach from tire chips that come into contact with groundwater. The high costs of producing rubberized asphalt and the small number of paved roadways limit the potential for manufacturing and using this product in southeast Alaska.

Light-weight roadbase use: A "low-tech" alternative use of waste tires is as a light-weight fill material in roadbed construction. This use simply requires that whole tires be split in half or quartered. The resulting tire "shreds" may be used in place of sand or gravel as subgrade roadbed material. In this type of use leaching is a concern. Generally, such use must be limited to areas where tire shreds will not come into contact with surface or ground water. Equipment to split tires in half or into four or six pieces ranges in price from $10,000 to $135,000.[6] This option merits further consideration.

IMPROVING CURRENT LANDFILL TECHNIQUES

Landfilling is still the primary disposal option, particularly in rural areas. At this time it may also be the least expensive option. Tires, however, take up a great deal of space and may damage landfill caps. The options discussed below offer practical solutions for improving current landfill practices in the event recycling or reuse are not judged to be economically feasible.

Tire splitting or shredding: Splitting tires or shredding them prior to landfilling can help make them easier to handle, reduce their volume by as much as 75 percent, and prevent them from rising to the surface. It also reduces the possibility that tires will be dumped or placed in stockpiles which attract rodents and mosquitoes. For this reason, many landfills around the country are using this method, although the high costs of equipment purchase, operation and maintenance are a deterrent. The equipment required for this option is

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[6] Jim Kelly, Minnesota Pollution Control Agency, Waste Tire Management Unit, St. Paul, Minnesota, September 3, 1991. Dan Burda, Eidal International Sales Corporation, Eidal Tire Cutter, August 29,1991 and product literature.

similar to that needed to convert tires into light-weight roadbed material. Actual equipment costs depend on the volume of tires processed and the size of shred produced. Tire splitters that can handle both truck and passenger tires and process up to 80 tires per hour are the least expensive and cost approximately $17, 000.[7] Units that can cut tires into four or six pieces, or that can reduce tires to four-inch shreds range in price from $75,000 to $200,000.[8] More versatile equipment, which costs $200,000 or more, is also available and can be used to shred both municipal garbage and waste tire. Such processing results in volume reductions of 5:1.[9]

Tire stockpiling or monofilling: Waste tires can also be managed or stored in a manner that allows them to be recovered at some future time when recycling economics improve. Stockpiling is one low cost option. Careful management, including limiting stockpile height, providing fire breaks, covering tires so water cannot accumulate in them, or spraying for mosquitoes, can eliminate most of the problems associated with tire stockpiles. Whole tires or tire shreds can also be placed in a dedicated section of existing landfills. This is known as monofilling and facilitates future recovery of waste tires.

III. REGULATORY TRENDS

Concern over the sound management of waste tires has led to numerous legislative proposals at both the federal and state levels. To date, six bills have been introduced in Congress and are under serious consideration. Key provisions of the bills include a ban on the landfilling of whole tires, mandated cleanup of existing waste tire piles, and a requirement that states implement recycling, abatement and disposal programs. It is also possible that such legislation would authorize the U.S. Environmental Protection Agency (EPA) to develop a more comprehensive regulatory program. Such a program would contain many of the same elements as current hazardous waste management programs, for example, specifying standards for the storage, handling, transport, and disposal of waste tires and, requiring tire haulers, collectors, and processors to obtain permits and be registered and certified in order to handle waste tires. Ultimately, federal regulation of waste tires is likely to increase the current cost of management and restrict certain management options.

Alaska is one of only seven states that does not regulate waste tires in some manner. State waste tire programs differ somewhat in scope but commonly include funding provisions, landfill restrictions, market incentives, and storage, processor, and hauler regulations. State regulations play a key role in supporting local governments' efforts to manage waste tires. For example, many states that collect fees from tire disposal or that tax tire sales, use the funds to provide grants to local governments and private businesses. State grants can then

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[7] Tim Rheault, Brannick Manufacturing Industries, Inc., Fargo, North Dakota, August 29, 1991.

[8] Mike Carpenter, Eidal International Sales Corporation, West Linn, Oregon, September 10, 1991, and product literature.

[9] Ibid.

be used to help pay for the cost of waste tire collection and disposal or to fund equipment purchases. Alternatively, some states have authorized local governments to collect fees to cover these expenses. Finally, many states also sponsor public education programs that teach motorists about various aspects of waste tire management. In short, it appears that strong state support and in some cases direct state intervention, is needed to develop and maintain effective waste tire programs at the local level.

IV. CONCLUSION AND RECOMMENDATIONS

There are many ways to recycle or reuse tires but none that clearly meet the needs of southeast Alaska communities. The region's low tire volume, small population, limited road system and high transportation and labor costs advise against the development of in-region waste tire processing capability. At this time, there are no simple, inexpensive methods for disposing of waste tires. It is also possible that some type of federal legislation will be passed that strictly regulates waste tire disposal. This makes it even more important that southeast communities work together now to develop alternative management strategies and identify ways to pay for collection and disposal of the region's waste tires. Following are three alternatives for addressing the region's waste tire management concerns:

- Continue to landfill waste tires and, within each community, investigate ways to reduce tire volumes and save space. Common methods include tire splitting, shredding, stockpiling, and monofilling.

- Explore, on a regional basis, the option of developing a regional market for TDF at the Sitka pulp and paper mill. As a processor of TDF, Waste Recovery, Inc. in Portland, Oregon may be able to help communities realize some savings on the cost of transporting waste tires out of the region for processing in exchange of the opportunity to expand the market for its product.

- Evaluate alternatives for funding the collection and disposal of waste tires including the constitutionality of establishing local fee programs and opportunities for obtaining recycling grants or loans from the state. Potential sources of funding for either local or state waste tire programs include fees collected from tire disposal, the sale of new tires, or vehicle registration or title tranfers.

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USED OIL MANAGEMENT REPORT

Introduction

The proper management of used oil is an issue of concern to many communities in Southeast Alaska. Because of its potential to harm the environment, used oil should not be managed with the general municipal solid waste stream.

Southeast Alaska communities face a variety of problems associated with the special management needs of used oil. In some communities used oil is being stored, rather than disposed of, because no affordable management option is available. In other communities the cost of their existing form of management has increased, causing them to seek less expensive management alternatives. In still other communities, the current form of management used may not be available over the long-term. Finally, a concern generally shared by communities, even those which are able to manage the used oil they currently collect, is that a significant amount of used oil generated is not collected because there is not a comprehensive used oil management program in place.

The purpose of this report to the Southeast Conference Solid Waste Management Committee is to begin assessing the feasibility of a comprehensive regional management system for used oil. A regional management system would entail identifying one or more end users (e.g., businesses) which can burn large quantities of used oil for energy recovery or otherwise manage the oil; and then organizing a system of collection and transportation of the communities' used oil to the end users. Such a regional system may be more economical and reliable than having each community attempt to manage its used oil by itself. To begin to explore the need for and feasibility of a regional system, this report provides information on three aspects of used oil management: current used oil generation and management in Southeast Alaska, the regulations pertaining to used oil management, and identification of potential regional management options for used oil. The report concludes with the finding that a more systematic regional approach to used oil management is feasible and desirable, and outlines an additional disposal alternative which could be accessed by the Region.

Current Generation and Management of Used Oil in Southeast Alaska

Information has been collected on the generation and management of used oil in each of the eight largest population centers in Southeast Alaska and by the Alaska Marine Highway System.[1] This information will help to determine the following:

- the quantity of used oil which may feed into a regional management system, and for which any identified end user(s) must then have sufficient management capacity;
- the quantities and sources of used oil for which collection and transportation logistics and costs would have to be analyzed;
- the existing need for used oil management alternatives; and

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[1] The eight communities are Craig, Haines, Juneau, Ketchikan, Petersburg, Sitka, Skagway, and Wrangell.

- the degree to which the need for management alternatives is expected to change in the future.

The information on used oil generation and management was gathered by contacting the likely generators and managers of used oil in each of the eight communities. These included the following types of sources:

- City and Borough Public Works Departments;
- Harbor masters;
- airports;
- power companies;
- local oil companies;
- service stations;
- pulp mills;
- other major industries in each community;
- State Department of Transportation offices; and
- Federal agencies (Coast Guard, Forest Service, Park Service).

On the following page is a table which summarizes the quantity of used oil generated annually in each community and the form of management it currently receives. The full results of the interviews conducted in each community are included as an attachment to this paper. The information gathered to date provides a good estimate of the amount of used oil generated in the eight communities and by the Alaska Marine Highway System.

As shown on the table, it is estimated that approximately 500,000 gallons of used oil are generated each year by the eight communities and the Alaska Marine Highway System. The generation figures range from 4,000 gallons per year generated in Haines to 200,000 gallons per year generated in Ketchikan. It is interesting to note that used oil generation does not correspond directly to community population. For example Ketchikan, with approximately half the population of Juneau, is estimated to generate twice as much used oil. This is primarily due to the relative lack of industry in Juneau compared with Ketchikan, which has several businesses that generate large quantities of used oil (e.g., the Ketchikan Pulp Company).

To estimate the amount of used oil which <u>may</u> feed into a regional management system, the generators and collectors contacted were asked how they currently manage their used oil. As shown on the table, the community generation figures have been categorized according to four different types of management: on-site management; storage; off-site management within the community; and off-site management outside of the community.

It is assumed that the used oil which is managed on site (i.e., by burning it for energy recovery in a waste oil furnace at the site where it is generated) would <u>not</u> feed into a regional management system. This is because these generators have little or no costs associated with their used oil management and therefore have no incentive to switch to another form of management which is likely to be more expensive.

Summary of Used Oil
Generation and Management Data
(gallons per year)

Southeast Conference Solid Waste Management Project

Community	Storage	On-Site Management	Off-Site, In-Community Management	Off-Site, Out-of-Community Management	TOTAL
Craig	0	7,790	0	1,100	8,890
Haines	3,150	0	500	0	3,650
Juneau	0	21,700	0	53,000	74,700
Ketchikan	0	20,200	80,600	120,500	221,300
Petersburg	0	0	15,000	4,000	19,000
Sitka	0	8,000	80,000	0	88,000
Skagway	200	3,600	0	0	3,800
Wrangell	1,010	0	0	13,400	14,410
Alaska Marine Highway System	0	0	0	30,000 *	30,000
TOTAL	4,360	61,290	176,100	150,900	463,750

* *Alaska Marine Highway System oil is managed in Juneau and in Bellingham, Washington*

Definitions:

Storage - generators currently are storing the used oil for lack of a management alternative.

On-Site Management - generators are using on-site management alternatives such as burning the used oil in furnaces.

Off-Site, In-Community Management - generators are using off-site management alternatives within the community, such as providing the used oil to local entities for use in industrial boilers.

Off-Site, Out-of-Community Management - generators are shipping the used oil out of the community for management.

The remaining amount of used oil has the potential to be managed as part of a regional system because the generators are either storing it for lack of an affordable management alternative or because the used oil is being managed off site at a cost to the generator (e.g., a private company is charging the generator to collect and dispose of the oil). These generators' participation in a regional management alternative would depend, of course, on the cost of the alternative. Approximately 330,000 gallons or 70% of the used oil generated is currently stored or managed off site.

It is important to note that the 330,000 gallon figure should only be used for planning purposes. This figure represents an estimate of the total quantity of used oil that could be managed as part of a regional system; it is not known whether the generators of this used oil would actually participate in a regional management system. However, this 270,000 gallon figure is important in assessing the feasibility of a regional management system, because end users must be identified who have the capacity to manage this quantity of used oil.

It is also important to note that the need for alternative management options is not static. For example, a generator who today indicates a need for or an interest in an alternative management option may in the future purchase a waste oil heater which would meet his management needs.

Regulation of Used Oil in Alaska

The purpose of this section is to provide information on the regulations governing used oil which are most relevant to issues associated with in-region transportation and management. This initial screening of regulations was conducted to determine whether, from a regulatory perspective, there are any "fatal flaws," or major barriers, to the development of a regional management system for used oil. This section is not intended as an exhaustive or comprehensive review of applicable regulations. The regulations reviewed in this section are those governing burning of used oil for energy recovery; the transportation of used oil; and the potential impacts of Marpol on used oil management.

Regulations Governing the Burning of Used Oil for Energy Recovery[2]

Most used oil in the United States is managed through land disposal, or recycled either by burning for energy recovery or by rerefining. Burning used oil for energy recovery is likely to be the most cost-effective method of management for Southeast's used oil, because there are currently businesses located in Southeast which accept used oil for burning. In addition, burning used oil for energy recovery means that a non-renewable resource is being reclaimed and reused.

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[2] The regulations governing the burning of used oil for energy recovery are contained in CFR Part 266.40, Subpart E.

The ability of Southeast Alaska's used oil to be burned for energy recovery depends on the level of contamination within the oil. There are three categories of used oil: on-specification used oil, off-specification used oil, and hazardous waste fuel. The specifications, or limits to contamination of a used oil sample, determine what type of combustion chamber may be used to burn the oil, and the amount of records and documentation required.

Oil with contaminant levels falling within the following specification levels is termed on-spec. Used oil fuel that exceeds any of these specification levels is termed off-spec.

Constituent/Property	Allowable Level
Arsenic	5 ppm max
Cadmium	2 ppm max
Chromium	10 ppm max
Lead	100 ppm max
Flash Point	100 deg. F min
Total Halogens	1,000 ppm max

Used oil is considered a hazardous waste if it is mixed with any amount of hazardous waste or if its organic halogen content exceeds 1,000 ppm.[3]

Southeast Alaska generates large quantities of both on-spec and off-spec used oil. While on-spec used oil can be burned in any furnace (e.g., non-industrial boilers), off-spec used oil can primarily be burned only in industrial furnaces or utility boilers. Any regional management system developed, therefore, must have as its end user an industrial furnace or utility boiler which has been approved to burn off-spec used oil.

It appears that little used oil is generated in Southeast Alaska that would be considered a hazardous waste fuel. However, because of the more stringent management requirements and potential liability involved, businesses with industrial boilers that can burn used oil generally cannot or will not accept hazardous waste fuel. Therefore, any used regional management system which is established probably would have to include testing of the used oil to ensure that it is not hazardous waste fuel.

Regulations Governing Transport of Used Oil

From a regulatory perspective, the transport of used oil by marine vessels does not appear to be a major barrier to the establishment of a regional management system. Used oil can be transported in drums or in bulk, is classified according to its flashpoint, and can generally be carried by vessels certificated to lade combustible liquids. Shipping companies do require testing and manifesting of used oil shipments. A discussion of the regulations, including some important up-coming revisions, follows.

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[3] The specification limit for total halogens is actually 4,000 ppm, but if oil is contaminated with 1,000 ppm or more halogens it is presumed to be mixed with a hazardous waste until testing proves otherwise.

The transport of hazardous materials such as waste oil is regulated under the Hazardous Materials Regulations (HMR), administered by the Department of Transportation (DOT).[4] The HMR govern the safety aspects of transportation. They include requirements for classification of materials, packaging requirements, hazard communication (i.e., package marking, labeling, placarding, and shipping documentation), transportation and handling, and incident reporting. It should be noted that the transport of hazardous waste triggers the application of additional regulations administered by the Environmental Protection Agency (EPA) under the Resource Conservation and Recovery Act (RCRA), in addition to those issued under the HMR. Since the used oil to be transported by the communities of Southeast Alaska as part of the regional management system is not likely to be hazardous waste, those regulations will not be discussed here.

Each vessel in a shipping company's fleet is issued a certificate specifying the classes of cargo it is permitted to lade. In general, it is the responsibility of the shipper to assure the cargo is packaged in approved containers, and that it is properly segregated and stowed aboard the vessel. The party offering the cargo for shipment is responsible for accurately classifying the cargo according to the DOT regulations, including testing. Used oil is classified according to its flash point. Flash point is defined as the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. Any liquid with a flash point below 100 degrees F. is classified as a flammable liquid. A combustible liquid is defined as a liquid that has a flash point at or above 100 degrees F. and below 200 degrees F. According to these criteria, Southeast Alaska's waste oil would be shipped as a combustible liquid.

These regulations, however, have recently been comprehensively revised by the DOT.[5] The major affect of the HMR amendments on the transport of waste oil concerns changes in the cargo classification criteria. Under the amendments, the flash point range for a flammable liquid will be increased from at or below 100 degrees F. to at or below 140 degrees F. The affect of this change is to reclassify liquids with flash points in the range from 100 degrees F. to 140 degrees F. from combustible liquid to flammable liquid. If waste oil is reclassified in this manner, it may complicate the shipping process by triggering more stringent regulations, and possibly reducing the number of shipping options available.

DOT, however, has decided to depart from the international accords which the amendments are intended to implement, and retain an optional domestic exception allowing shippers to reclassify a flammable liquid which falls within the 100 to 140 degrees F. range as a combustible liquid, thereby avoiding the more stringent shipping requirements. If the waste

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[4] These regulations, issued pursuant to the Hazardous Materials Transportation Act (HMTA), are found in the Code of Federal Regulations (CFR), Title 49, Subtitle B, Chapter 1, Subchapter C, Parts 171 through 180.

[5] Performance-Oriented Packaging Standards; Changes to Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative, 49 CFR Part 107, et. al. Presently, cargo may be transported in accordance with the old regulations or in accordance with the amendments. Effective October 1, 1991, however, compliance with the amendments is mandatory.

oil is reclassified in this manner, there should be no significant change in the way the oil is shipped when the changes go into effect on October 1.

It should be noted that this interpretation is based on our preliminary reading of the new regulations, and has not been confirmed by the Coast Guard. The Coast Guard is verifying this interpretation, and it may be that the optional domestic exemption cannot be applied in the case of maritime transport of used oil.

Impact of Marpol[6] on Used Oil Management in Southeast Alaska

Marpol consists of five Annexes or chapters. Each Annex addresses a different source of marine pollution from ships, with the first Annex consisting of regulations to control pollution from oil. This Annex entered into force in 1983 and regulates the discharge of oil into ocean waters by ships, requires them to have on board equipment to monitor and control oil discharges, and, of most importance to communities, requires ports to have waste oil collection facilities.

The Coast Guard issues Certificates of Adequacy (COA) to ports certifying that they are in compliance with the Marpol regulations. The Coast Guard can issue waivers exempting ports from compliance if it finds there is no need for the service because, for example, ships never request port facilities to manage their oil. Some ports have been granted waivers.

The Coast Guard is reevaluating port compliance with Marpol, and plans in the very near future to reissue COAs. In order to obtain a waiver, communities will have to state why they are unable to provide used oil disposal capacity (e.g., due to economic hardship). Communities will also have to propose an alternative for how used oil from vessels, which may otherwise offload used oil in the community, can be managed. One alternative which may be possible for communities, based on discussions with the Coast Guard, is to develop a cooperative agreement with other communities to share the burden of accepting used oil. For example, one community which has adequate capacity can agree to accept used oil from vessels which would normally offload in another community.

There are still a number of unresolved issues relating to Marpol, used oil, and impacts on the communities. While in the future it is possible that communities may be required to accept additional wastes from marine vessels, it also appears that alternatives exist to decrease the impact of Marpol for communities for which accepting additional waste from vessels would be a hardship.

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[6] The International Convention for the Prevention of Pollution from Ships developed an international treaty called "Marpol". The title "Marpol" comes from a conjunction of the words marine pollution. The United States has ratified Annexes I, II, and V of Marpol.

Regional Management Options

One of the first steps in exploring the feasibility of a regional management system is to determine whether any management alternatives exist which may be more economical or reliable than those presently being used in the communities and by the Alaska Marine Highway System. The used oil generated in Southeast Alaska can be managed either within the region or outside of the region. Described below are the potential in-region and out-of-region management options which have been explored.

In-region Management Options

A regional management system for used oil could utilize a single end user (i.e., a centralized system) or it could utilize multiple end users (i.e., a decentralized or "hub" system). The best system for Southeast will depend on factors such as the comparative cost of transportation to either location from the communities, the cost charged by each of the end users to accept used oil, and the capacity which each has to burn used oil (e.g., one end user may not be able to handle all of the communities' used oil).

Two alternatives have been explored: a Sitka-based alternative (involving the Alaska Pulp Corporation); and a Ketchikan-based alternative (involving the Ketchikan Pulp Company and other parties). The Ketchikan-based alternative has been more fully developed at this time, primarily because of the potential availability in Ketchikan of an oily-water separator to convert oily water into fuel. Both of these alternatives would be in addition to those disposal methods already in place in Southeast Alaska communities.

Ketchikan-based Alternative

This alternative generally entails collection of used oil and oily water from Southeast Alaska communities and the Alaska Marine Highway System, processing oily water at the Ketchikan Shipyard, Inc., and ultimate disposal of the used oil via burning for energy recovery at the Ketchikan Pulp Company.

The project has initiated the development of this alternative via an Agreement In Principle among the City of Ketchikan, the Alaska Marine Highway System, the Ketchikan Shipyard, Inc., the Southeast Conference, and the Ketchikan Pulp Company. While not legally binding, the Agreement affirms the willingness of the signatories to work in cooperation to help put the alternative into practice. A copy of the draft Agreement In Principle is attached as an Appendix to this report.

Communities and the signatories to the Agreement In Principle need to continue discussions on the precise ways in which the Agreement would operate. This would include: 1) exploring the responsibilities of the communities and the Alaska Marine Highway System for accessing this alternative, including collection, testing, shipping, and storage; 2) determining how used oil will be transported; and 3) identifying the cost of the alternative (the signatories have agreed to charge "fair and reasonable costs" given that safe oil management is in the public interest).

Sitka-based Alternative

The Alaska Pulp Corporation (APC) in Sitka burns eleven million gallons of fuel a year. Of this amount, approximately 5,000 gallons is used oil generated by the corporation. They do not currently accept used oil from any outside sources.

Contact has been made with APC. APC's initial response was positive and the pulp corporation is interested in discussing further the possibility of accepting used oil from southeast communities. APC is concerned about inadvertently receiving hazardous waste fuel from communities. They would want assurance (e.g., through testing) that the used oil they receive is not hazardous waste fuel.

Over the remainder of the project, the viability of the Ketchikan Pulp Company and the Alaska Pulp Corporation as potential management alternatives will continue to be assessed. In addition, research will be conducted to identify other potential alternatives.

Out-of-Region Management Options

Four companies have been identified which accept used oil in the Seattle-Bellingham-Vancouver area. The highest cost charged to accept the used oil is 50 cents per gallon and one company offers a payment to the customer of five cents per gallon (although some of Southeast's used oil would not meet the requirements for flash point required by the company). It is important to remember that the costs of transportation will add significantly to the overall cost of managing used oil out-of-region.

These companies and the associated costs charged/revenues paid for managing the used oil are listed below. (Please see the market information contained in your recycling materials packet for a more complete description of these companies and their used oil specifications.) The full cost of the out-of-region alternatives (i.e., including transportation) will continue to be researched over the remainder of the project.

Markets	Price Range (cents per gallon)
Petroleum Reclaiming and Refining Tacoma, WA	-25
Spencer Environmental Services Seattle, WA	-50 to +5
Vintage Oil Anacortes, WA	-12
Mohawk Lubricants Ltd. Vancouver, B.C.	-25 to $0

Conclusion

From the research conducted it appears that a more systematic, regional approach to used oil management is feasible. Within each community, at least some need has been indicated for affordable and reliable management alternatives. In addition, the project has identified and initiated the development of an additional used oil alternative based in Ketchikan, which could be accessed by communities in the Region.

Communities should systematically consider their immediate and longer-term needs for used oil management. By developing a clearer sense of their current and future used oil generation rates and management capacity, communities will be better able to evaluate their needs vis-a-vis the Agreement In Principle as well as any current management system they might have.

Overall, it appears that the development of an additional used oil management alternative available to all communities in the region would be beneficial and, for some communities and the Alaska Marine Highway System, may be crucial. If a management alternative is put into place that can be accessed by communities as their needs change or grow, communities are more likely to be able to ensure the safe, legal, and environmentally sound management of used oil.

USED OIL MANAGEMENT REPORT APPENDICES

APPENDIX A: USED OIL GENERATION AND MANAGEMENT INFORMATION ON INDIVIDUAL COMMUNITIES

APPENDIX B: DRAFT AGREEMENT IN PRINCIPLE FOR USED OIL MANAGEMENT

APPENDIX A: USED OIL GENERATION AND MANAGEMENT INFORMATION ON INDIVIDUAL COMMUNITIES

Craig

Total Annual Generation: 8,890 gallons

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
City of Craig Public Works Mike McKimens 826-3275 *Harbor Master* Mike Kampnich 826-3275	2,000 gal/yr	Harbors - 90% City maintenance shop - 10% Uplanders may use the harbor tanks.	Four 275-300 gal tanks at harbors. City will purchase four additional tanks next year. City collects oil from tanks and burns in city maintenance shop burner.	Have not yet done cost assessment of collection, transportation. No direct fee on harbor users - considered a service included in moorage rate.		The City can manage current generation. May need management alternative if there is significant growth from the planned harbor expansion.
DOT Joe Pape 789-6221	500-750 gal/yr	DOT/Public Facilities station.	Approx 4-6,000 gal stored. Installing waste oil burner furnace by this winter that will manage all of it.			
Alaska Power Jim Billingsley 826-3202	3,000 gal/yr	Oil from generators at 3 plants: Craig Haidaburg Hallas	Collects when changes oil on generators. Transports to Craig, re-filters, pumps into diesel tanks, and burns in engines.	Have not done a cost analysis.		
C & W Repair Steve Warren 826 3450	1,000 gal/yr	Oil changes from pickups and autos.	400 gal capacity in 55 gal drum Was sending to White Pass, will install and use a waste oil burner in the future.	No cost	No testing	Cost, convenience are factors in reviewing alternatives. White Pass has a collection truck.

Craig *Continued*

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
JS Construction Jim Sealy 826-3633	450-500 gal/yr	Oil from Dump Trucks, Caterpillar tractors, heavy machinery.	Collect when change oil from heavy machinery. Have a stove rigged for heat. Seldom take oil from other sources. Store used oil in 55 gal drums.			
White Pass Tony Leichty 826-3450	1,000 gal/yr ** counted in White Pass-Ketchikan volume*	Mostly boats	Collect using delivery trucks. Send by fuel barge to Main Terminal in Ketchikan.	Charge 39 cents/gal Unless 5 gal or less, then no charge.	Testing done at Main Terminal in Ketchikan.	Power Co. can use some used oil for electrical generation with an injection system.
Mitsi Enterprises Mechanic on duty 826-3984	330 gal/yr ** counted in White Pass Volume*	Trucks, tractor trailers	The Chevron distributor collects used oil.			
Arrowhead Transfe Larry Coleman 826-3419	100-110 gal/yr	Tractor trailers, personal autos.	Send to Alaska Marine Lines	No charge	No test required yet, Alaska Marine does the testing.	Might install a burner for heating.
Alaska Timberland 826-3998 755-2394 shop	840 gal/yr	Trucks, heavy machinery.	Use to start fires from waste wood. Store in 55 gal barrels, give the rest to others for slash burning.			

Haines

Total Annual Generation: 3,650 gallons

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
City of Haines Public Works Walt Wilcox 766-2231	1,500 gal/yr	Small harbors: 1,000 gal/yr City: 500 gal/yr	300-gal tank at harbor. When full, City transfers to 5,000-gal city tank. Currently have no way to dispose of oil stored in their 5,000-gal tanks.			
DOT Joe Pape 789-6221	500-750 gal/yr	DOT/Public Facilities station.	Vendor in town burns in his garage.			
Totem Oil 766-3190	Does not generate or collect used oil.					
White Pass David Black 766-2338	Does not generate or collect used oil.					
Chilkoot Lumber Mill Larry Beck 766-2511	Not in Operation. Produces 2,500 gal/yr when in operation.	Fork Lifts, plant machinery	Stored in a large tank and drums. Used to oil chains, and supplement fuel used in the company steam plant.	No cost	Would have someone test for use in the steam plant.	
Second Ave Auto Dianne 766-3100	1,650 gal/yr	Oil changes from pickups, autos Could increase over next year.	Stored in 55 gal drums. Currently have no way to dispose of oil. May install a burner.		Used to use $15 test, then state tested oil, became too expensive.	Used to give to another vendor in town, but started to require more extensive testing.
Harbor Master Bob Stokely 766 2448	1,000 gal/yr * *counted in City volume*	Boats	Stored in a 500 gal tank on wheels and Public Works picks the oil up.		Public Works tests the oil.	

Juneau

Total Annual Generation: 74,700 gallons

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
Public Works Ernie Muller 586-5254	5,100 gal/yr	Generated by 2 Public Works vehicle maintenance shops: Transit shop - 1,500 gal/yr Downtown shop - 3,600 gal/yr No collection from citizens.	Downtown shop furnace burns some of it. Rest has been stockpiled - approx. 10,000 gal in storage awaiting new oil burner furnace in transit shop building. Anticipate that this will meet Public Works demand. Additionally, sludge incinerator, on-line in late 1992, may use waste oil as auxiliary fuel - could use 300 gal to 50,000 gal/yr, according to project manager.			
Harbor Master Joe Graham 586-5255	15-20,000 gal/yr * *counted in CMS, Inc. volume*	Harbor tanks - boaters and upland users.	Had been collected by contractor, who ships to Seattle. Harbor installing oil burners for heat; operational in Aug; should manage all harbor oil.	Fee incorporated in base rate of harbor users (upland use is thus subsidized). Contractor paid by Harbor - $1.53/gal	Contractor tests. If contaminated, City pays for special tests, handling.	Volume collected doubled in 1989 due to MarPol and increase in traffic.
CMS, Inc. Ernest Polly 780-6545 *Douglas Oil & Heat* John Berthal 789-1917	60-80,000 gal/yr	Collect and manage used oil from: City - 8-10,000 gal/yr State DOT - 5,000 gal/yr 2 mining cos - 16,000 gal/yr AK Marine Highway System Service stations AK Light and Power US Coast Guard US Navy	Douglas Oil & Heat collects used oil and delivers to CMS, Inc for management. Oil sent to Seattle for final disposition by Northwest Enviroservices.	Customers are charged $1.53/gal for collection, testing, and final management.	Chlor-D-Tect test performed upon collection. Extensive testing when accumulation reaches 4,800 gallons in segregated storage at CMS. Test for flashpoint, BSW, halogens, and PCBs. Primarily off-spec oil.	

Juneau *Continued*

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
Taku Oil Jeff Hanson 586-1276	8,000 gal/yr	Major customers only: 3 gas stations tugboats major contractors	Union Oil Co (parent company) collects, ships to Ketchikan	No fee on customers Very expensive, so Union may impose a fee	Union Oil does lab tests	
DOT Joe Pape 789-6221	750 gal/yr ** counted in CMS volume*	DOT/Public Facilities station	Douglas Oil & Heat collects. May think about furnace in next year's budget.	$0.75/gal for pick-up and disposal.		
Airport Ralph Sanford 789-4001	4,000 gal/yr May increase due to growth . ** counted in CMS volume*	Intended for use by small private planes, but now some small commercial users too.	Douglas Oil & Heat collects. Will construct new shop in next 3-5 yrs; anticipate will install an oil burning furnace - will meet demand easily.	$0.33/gal, in maintenance budget. Because oil collection greater than expected and disposal cost may rise and so may have to develop fee.		
Honda Hut Parts Depart 789-0946	1,600 gal/yr	Oil changes - 1,100 gal/yr Foreign Auto Repair - 500 gal/yr	Stored in 55 gal drums. Have a waste oil furnace for heat.		no testing	Could use an alternative, get backed up in the summer.

Ketchikan

Total Annual Generation: 221,300 gallons

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
City of Ketchikan Public Works Fred Monrean 225-3111 *Harbor Master* Doug Ensley 228-5637	8-9,000 gal/yr Increasing due to growth in traffic. * *included in Pulp Co. volume*	Sources are harbor users, plus some uplanders, and the City.	3,000-gal tanks at harbor. Transport to 2 3,000-gal tanks at landfill; then transport to Ketchikan Pulp Co. Public Works shop burns 6-800 gal/yr.	Pay Ketchikan pulp $0.10/gal for on-spec oil. Have budgeted $1,200/yr to collect and manage the used oil; derives from harbor use fees.	Run a lab test on each tank at landfill when 80% full. So far, all oil has been on-spec and has met Ketchikan Pulp's requirements.	
Ketchikan Public Utilities Nick Fabrello 225-4814	915 gal/yr * *included in bulk plant volumes (White Pass and/or Anderes)*	Bailey Plant - 825 gal/yr Totem Bite Plant - 15 gal/yr Beaver Falls Plant - 30 gal/yr Ketchikan Plant - 30 gal/yr Silvus Plant - 15 gal/yr	Returns to distributor of oil: Anderes or White Pass	Approximately $10/barrel	Distributors test. If it doesn't pass flashpoint test, will return it.	
Anderes Oil Co Dave 225-2163	20-40,000 gal/yr * *included in Pulp Co. volume*	Marine customers - 35,000 gal/yr Bailey Power Plant - 2,500 gal/yr Contractors, canneries, autos - 2,500 gal/yr	Ketchikan Pulp Co burns it	No fee yet. Pays Ketchikan Pulp Co to take it.	All on-spec oil. Spectra Labs in Seattle tests.	
Unocal Bob Bauer 225-4176	20,000 gal/year * *included in community-specific volume estimates, thus not counted in Ketchikan volume.*	Commercial customers of lube oil - distributors in communities: Sitka Wrangell Petersburg Juneau Hoonah, Hobart, Klowak, Metlacatlah	Accumulates in 63,000 gal tank. Every 2 years, ships on Unocal Barge to Seattle. Company mgmt has not yet approved his idea to set out a barrel for local community use because of potential for contamination.	No fee yet Estimates it costs him $1/gal to handle, test oil.	Does flash test on 55-gal drums. If passes, does Chlor-D-Tect. About 99% is on-spec. Returns to generator if off-spec.	Has never had any HW.

Ketchikan *Continued*

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
DOT Joe Pape 789-6221	500-750 gal/yr	DOT/Public Facilities station	Private entity in town collects and ships to Seattle for recycling.	DOT is charged $0.75/gal.		
Petro Alaska Ed Stefan 225-1985	50,000 gal/yr Increasing due to growth in business.	Sources throughout Southeast: mining construction logging marine	Ships to Seattle.	Fee on larger accounts depending on logistics required to collect, transport, etc. Fee varies accordingly - up to $1.50/gal.	Accepts only on-spec oil: motor oil, hydraulic oil, and gear oil. Customer does testing before Petro Alaska will accept.	
Ketchikan Shipyard Craig Trettevik 225-0400	3,000 gal/yr of oil (separated from approx 6,000 gal bilge slop). Scaled-down operation: had been collecting approx 75,000 gal of oil. ** included in Pulp Co volume*	Current sources: primarily tugboats. Previously had accepted from cruise ships, tugs, and AK Marine Highway System.	Collect in 10,000 gal and 12,0000 gal tanks. Process on-site to separate water from oil. Truck to Ketchikan Pulp Co.	Pay Ketchikan pulp $0.10/gal. Charge customers: $50/hr labor to collect oil $75/hr for truck rental $1/gal to separate, transport	All on-spec oil.	
Ketchikan Pulp Co Cy Young 225-2151	100,000 gal/yr	Ketchikan Shipyard - approx 50,000 Anderes Oil - approx 20,000 Pulp Co - approx 20,000 Harbor Master - approx 10,000	Burned for energy recovery	Charges $0.10/gal to take on-spec oil; $0.25/gal to take off-spec used oil.		

Ketchikan *Continued*

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
USFS Engineering Depart 225-3101	200-250 gal/yr	USFS offical vehicles	Have a waste burner in the maintenance shop, city has collector barrels at the municipal land fill.		City tests when brought to municipal land fill.	
Airport Bill Hill 225-6800/2375	600-900 gal/yr	Snowblowers, dump trucks, Caterpillar tractors	Stored in 55 gal drums, furnace heaters at Ketchikan Air Service.	Charged $.25/gal by Ketchikan Air Service	Every time change oil send to Caterpillar for testing.	
South Coast Inc 225-6125	2,000 gal/yr ** 1,500 gal included in Petro Alaska volume*	Earth movers, pickup trucks	Returned to oil companies, Petro Alaska - 70%, Waste oil burner for heating - 30%		Petro Alaska tests	
White Pass George Tipton 225-2106	70,000-80,000 gal/yr ** includes 1,000 gal/yr received from White Pass - Craig*	80% from boats 15% electrical generation 5% from service stations	Storage tanks have 45,000 gal capacity. Barges and tankers take to Mohawk Oil, Vancouver and NW Processors in Seattle.		Samples taken from top, middle, and bottom of filled tanks. Min flash temp of 100 degrees.	Cost effective to have alternatives- incinerators in Sitka, Juneau, and Ketchikan.

Petersburg

Total Annual Generation: 19,000 gallons

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
City of Petersburg Public Works Eli Lucas 772-4430 *Harbor Master* Jim Stromdahl 772-4688	8,000 gal/yr * *included in Icicle Seafoods volume*	Harbor users - 7,000 gal/yr Public Works - 1,000 gal/yr	Six 350-gal dumpsters at harbors. City collects and transfers to Icicle Seafoods (Petersburg Fisheries). City may install burner at equipment garage, so might burn some.	No fee.	Random sampling, approximately twice/yr. Mostly off-spec oil.	Has not had any hazardous waste oil.
DOT Joe Pape 789-6221	500-750 gal/yr * *included in Icicle Seafoods volume*	DOT/Public Facilities station.	Petersburg Fisheries burns in furnace .	No fee.		
Icicle Seafoods/ Petersburg Fisheries Ron Lindsey 772-4294	15-20,000 gal/yr	City and Harbor - 8,000 gal/yr USCG 2 oil companies Mitkof Lumber Co DOT - 500-750 gal/yr	Burned in furnace for heat and fish processing .	No fee. A community service, as it is expensive to collect, transport, maintain the special boiler, and run the risk of getting comtaminated oil.	Generators test and promise that the oil is on-spec.	
Alaska Fuel Service Rory Smith 772-4219	4,000 gal/yr	Collect from customers - marine commercial fishing boats.	Barge weekly to Union Oil in Ketchikan for management. Used to send to Icicle, but Icicle asked people who had other options to try to use them.	No fee.	Don't test - Union Oil tests. If oil test fails, it is sent back.	

Petersburg *Continued*

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
Petersburg Motors Norm Fredrickson 772-3223	600 gal/yr * included in Icicle Seafoods volume	Oil changes from autos and pickups.	Stored in 55 gal drums, take to Icicle Seafoods which burns oil in a boiler.	Do their own testing		
The Mill, Inc. Pete Lithiem 772-3275	No estimate available	Change oil in machines every 200 - 500 hrs of use.	Give most to Icicle Seafoods, starting a disposal program with oil company. Also considering a boiler.			
DOT Ken Hagerman 772-4672	500 gal/yr * included in Icicle Seafoods volume	Road and airport maintenance equipment.	Use a 500 gal underground storage tank, take to Icicle Seafoods.	No cost to dispose at Icicle Seafoods.	Test once a year- send to a Anchorage lab- costs $100 All used oil On-spec.	

Sitka

Total Annual Generation: 88,000 gallons

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
Sitka Sound Oil Tony DelMoral 747-3224	80-90,000 gal/yr	Majority of oil from harbor tanks & bulk plants. Other sources include: US Coast Guard - 17,000 gal/yr Union Oil Gas Station - 10,000 gal/yr Heating oil distributors - 8,000 gal/yr	Sheldon Jackson College boiler.	Sheldon Jackson College charges/pays nothing for the used oil. City contracts with Sitka Sound Oil for the service.	Preacreens sources Chlor-D-Tect on small batches Lab test on 10,000 gal - $400. If off-spec, blends to on-spec.	
Harbor Master Brian Bergman 747-3439	22,500 gal/yr * *included in Sitka Sound Oil volume.*	20,000 gal from harbor tanks - boat moorers and upland users. 2,500 gal from small cruise chips. If deepwater dock is constructed, may accept oil from large ships as well.	Six 500-gal storage tanks at Harbor. Sitka Sound Oil collects and transports.	City contracts with Sitka Sound Oil for testing, collection, and transportation to College, for $2/gal.	City supplies 13,000-gal holding tank at landfill. City conducts the testing. City is responsible for alternate management if oil is unburnable.	
White Pass Alaska Warren Pellet 747-3414	1,000 gal/yr * *included in Sitka Sound Oil volume.*	Customers only	55-gal drums picked up by Sitka Sound Oil .	No fee charged to customers.		
DOT Joe Pape 789-6221	300-400 gal/yr	DOT/Public Facilities station	Delivers to Sheldon Jackson College boiler.			
Texaco Jerome Brown 747-8460	3,000 gal/yr Has increased due to expanded services	Tugboats Large vessels Automotive	Waste oil burner in garage.	Charges $25/55-gal barrel. Doesn't charge for small quantities.	All on-spec. Doesn't test because knows sources. Generators of barrels sign a release attesting to source of oil.	
Alaska Pulp Corp. Rollo Pool 747-2283	5,000 gal/yr	Generated in-house.	Burned for energy recovery.			

Skagway

Total Annual Generation: 3,800 gallons

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
City of Skagway Skagway Recycling Report *Harbor Master* Ken Russo 983-2628	1,300 gal/ yr	Harbor users, some upland dumpers.	Public collection container at marina. Public Works collects and stores at wastewater treatment plant with City's used oil. City hopes to burn either by converting boiler or by purchasing a new waste oil furnace.	No fee charged - comes out of Public Works budget.		City may only be able to burn what it generates unless harbor oil is tested for contaminants.
DOT Joe Pape 789-6221	500-750 gal/yr	DOT/Public Facilities station	Approx 14-15,000 gal stored. Installing waste oil burner furnace by this winter that will manage all of it.			
White Pass Skagway Recycling Report	200 gal/yr	Collected from bulk plant customers.	Burned in shop boiler.			
Alaska Power Jim Billingsley 826-3202	1,000 gal/yr	From generator at plant.	Collects when changes oil in generator. Filters, pumps into diesel tanks, and re-burns.	No cost analysis done.		
Hoover's Chevron Skagway Recycling Report	600-800 gal/yr	Service station Automobile owners National Park Service	Burned in oil furnace.			
Skagway Airport Skagway Recycling Report	200 gal/yr	Airport users.	Stored. Currently no management outlet.			

Wrangell

Total Annual Generation: 14,410 gallons

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
City of Wrangell Bob Caldwell 874-3904 *Harbor Master* David Mork 874-3736	250 gal/yr	Public Works	Storing used oil in drums. Will purchase used oil burner next year. Considering setting up a landfill collection point for homeowners. Harbor has no tanks, wants to purchase 500-gal storage tanks. Estimates would collect 5,000 gal/yr if had tanks. Currently encourages boat owners to take oil to bulk plants.		Oil generated is on-spec.	The City burner would not be able to manage all of the used oil collected from the harbors. Estimates 50% could be burned in the City burner.
Wrangell Oil Sam Privett 874-3276	13,200 gal/yr	Used lube from major customers only: tugboats lumber mill fishing boats	Barged to Union Oil in Ketchikan. Union Oil barges to Seattle.	No fee yet, but Union Oil may impose one to cover expenses.	May do test on barrels for halogens; Union Oil does lab tests.	
Chevron Delta Western Bryant Olson 874-2388	110-165 gal/yr	Regular customers (fishing boats).	Had been burning at airport. Now storing until another option is available.	No fee.		
White Pass AK Jerry Davis 874-3977	Does not generate or collect.					
Wilcox Automotive 874-3297	Unknown	In-house generation only.	Burns in waste oil heater.			

Wrangell *Continued*

Business/ Agency	Volume Generated or Collected	Generators	Management	Cost	Testing	Other Comments
Fenimore Service Station 874-3687	200-250 gal/yr	In-house generation only.	Barged to Union Oil Co in Ketchikan. Union Oil barges to Seattle.	No fee yet, but Union Oil may impose one to cover expenses.		
DOT Joe Pape 789-6221	500-750 gal/yr	DOT/Public Facilities station.	Approx 2,000 gal stored. Have no management outlet.			
C & E Bradley Diane 874-2361	Does not generate or collect used oil.					
Airport John Keso 874-3107	150 gal/yr	Road and airport machinery	Have no disposal method at present. Until last year city used oil for fuel, also used for fire training at airport.		No testing, but water, sludge, and solvents present.	

APPENDIX B: DRAFT AGREEMENT IN PRINCIPLE FOR USED OIL MANAGEMENT

AGREEMENT IN PRINCIPLE
Pertaining To
USED OIL MANAGEMENT IN SOUTHEAST ALASKA

Purpose

The purpose of this Agreement In Principle is to help ensure that used oil generated in Southeast Alaska is safely disposed of both now and in the future. To ensure that used oil is disposed of safely, used oil generators must have access to legal, economical, and reliable disposal alternatives.

This Agreement outlines a potential alternative for disposing of used oil. The disposal alternative generally entails collection of used oil from Southeast Alaska communities and the Alaska Marine Highway System, processing of the used oil at the Ketchikan Shipyard, Inc., and ultimate disposal of the used oil via burning for energy recovery at the Ketchikan Pulp Company. This alternative would be in addition to those disposal methods already in place in Southeast Alaska communities. This Agreement In Principle is not legally binding; however, the signatories herein affirm their willingness to work in cooperation to help put this alternative into practice.

Findings

Due to its potential to harm human health and the environment, the proper disposal of used oil is an issue of great concern to Southeast Alaska communities and to the Alaska Marine Highway System.

The development of an additional disposal alternative for used oil would be beneficial to Southeast Alaska: some communities and the Alaska Marine Highway System currently need a more reliable or economical way to dispose of used oil; other communities may need additional disposal capacity in the future.

Any disposal alternative which is developed should ideally have the following three characteristics: 1) it should be located within the Region to minimize the costs associated with transporting used oil; 2) it should include an oil-water separator and management process, so that oily water can be converted into oil suitable for burning as fuel; and 3) it should have sufficient capacity to manage a significant quantity of used oil generated in Southeast Alaska. In addition, any disposal alternative developed must comply with all state and federal regulations.

Principles

The used oil disposal alternative described herein would be based in Ketchikan and would involve the following entities: Alaska Marine Highway System, City of Ketchikan, Ketchikan Shipyard, Inc., Ketchikan Pulp Company, Alaska Department of Environmental

Conservation, and Southeast Alaska communities. The potential role of each of these entities is outlined below.

The Alaska Marine Highway System agrees to work with Southeast Alaska communities to develop a plan for transporting their used oil to Ketchikan, either on the ferry system or on another carrier.

The City of Ketchikan agrees to allow used oil to enter the community, provided that it is not hazardous waste and provided that the movement of used oil through the community is consistent with all federal and state regulations.

The Ketchikan Shipyard, Inc. (KSI) agrees to make available to Southeast Alaska communities and the Alaska Marine Highway System its oil-water separator and management facility, if the facility's capacity is expanded in the near future as currently planned. Oily water generated in the communities and by the Alaska Marine Highway System can be processed by the facility, with the final product being used oil suitable for burning for energy recovery. The facility will be managed in accordance with all federal and state regulations.

The Ketchikan Pulp Company (KPC) agrees to work with Southeast Alaska communities, the Alaska Marine Highway System, and the Ketchikan Shipyard, Inc. to accept on-specification used oil to be burned in KPC's woodwaste power boilers. KPC also agrees to work with these entities to accept off-specification used oil, as long as it is generated by conditionally exempt small quantity generators, as long as it is allowable under state and federal law, and as long as it does not adversely impact KPC's Air Quality Permit To Operate. The delivery of used oil shipments must be prearranged with KPC. KPC agrees to accept used oil only as long as burning used oil for energy recovery continues to be consistent with state and federal regulations.

The Alaska Marine Highway System, KSI, and KPC agree to make their services available at a fair and reasonable cost, given that the safe management of used oil is in the public interest.

The Southeast Conference agrees to work with Southeast Alaska communities and the Alaska Marine Highway System to determine their immediate and longer-term needs for this disposal alternative, in order to facilitate the planning and implementation of this alternative.

The Alaska Department of Environmental Conservation agrees to supply technical assistance and to continue to advise the other signatories on regulatory issues associated with this disposal alternative.

Future Actions Which Will Be Taken to Implement This Agreement

The signatories to this Agreement will continue to work together to explore the feasibility of and costs associated with putting this disposal alternative into practice.

This will include establishing the following: 1) the price which will be charged for each aspect of the alternative (i.e., transportation, oil-water separation, and burning used oil as fuel); 2) how used oil will be moved from dockside to the Ketchikan Pulp Company; and 3) the responsibilities of the communities and the Alaska Marine Highway System for retaining access to this alternative over the long term, including testing, shipping, and storage.

Once these items have been established and the alternative becomes operational, the signatories to this Agreement will notify Southeast Alaska communities and the Alaska Marine Highway System of the availability of this used oil disposal alternative.

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Ted Ferry
Mayor, City of Ketchikan

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Jim Ayers
Director, Alaska Marine Highway System

_____

Steve Seley, Jr.
President, Ketchikan Shipyard, Inc.

_____

Ralph Lewis
Controller, Ketchikan Pulp Company

_____

Dick Griffin
President, Southeast Conference

_____

Dick Stokes
Southeast Regional Administrator,
Alaska Department of Environmental
Conservation

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Personal Communication. Jeff Ingalls. Compliance Coordinator. Hazardous Waste Program. Alaska Department of Environmental Conservation.

Personal Communication. Lieutenant Kasparek. United States Coast Guard. Marine Safety Office. Juneau, AK.

Personal Communications with Used Oil Generators and Managers:

Craig

Jim Billingsley. Alaska Power.
Larry Coleman. Arrowhead Transfer.
Mike Kampnich. Harbor Master, City of Craig Public Works.
Tony Liechty. White Pass.
Mike McKimens. City of Craig Public Works.

Joe Pape. Department of Transportation.
Jim Sealy. JS Construction.
Steve Warren. C & W Repair.

Haines

Larry Beck. Chilkoot Lumber Mill.
David Black. White Pass.
Joe Pape. Department of Transportation.
Bob Stokely. Harbor Master, City of Haines.
Walt Wilcox. City of Haines Public Works.

Juneau

John Berthal. Douglas Oil & Heat.
Joe Graham. Harbor Master.
Jeff Hanson. Taku Oil.
Ernie Muller. Public Works.
Joe Pape. Department of Transportation.
Ernest Polly. CMS, Inc.
Ralph Sanford. Airport.

Ketchikan

Bob Bauer. Unocal.
Doug Ensley. Harbor Master, City of Ketchikan.
Nick Fabrello. Ketchikan Public Utilities.
Bill Hill. Airport.
Fred Monrean. City of Ketchikan Public Works.
Joe Pape. Department of Transportation.
Ed Stefan. Petro Alaska.
George Tipton. White Pass.
Craig Trettevik. Ketchikan Shipyard.
Cy Young. Ketchikan Pulp Co.

Petersburg

Norm Fredrickson. Petersburg Motors.
Ken Hagerman. Department of Transportation.
Ron Lindsey. Icicle Seafoods/Petersburg Fisheries.
Pete Lithiem. The Mill, Inc.
Eli Lucas. City of Petersburg Public Works.
Joe Pape. Department of Transportation.
Rory Smith. Alaska Fuel Service.
Jim Stromdahl. Harbor Master, City of Petersburg.

Sitka

Brian Bergman. Harbor Master, City of Sitka.
Jerome Brown. Texaco.

Tony DelMoral. Sitka Sound Oil.
Joe Pape. Department of Transportation.
Warren Pellet. White Pass Alaska.
Rollo Pool. Alaska Pulp Corp.

Skagway

Jim Billingsley. Alaska Power.
Joe Pape. Department of Transportation.
Ken Russo. Harbor Master, City of Skagway.

Wrangell

Bob Caldwell. City of Wrangell.
Jerry Davis. White Pass Alaska.
John Keso. Airport.
David Mork. Harbor Master, City of Wrangell.
Bryant Olson. Chevron Delta.
Joe Pape. Department of Transportation.
Sam Privett. Wrangell Oil.

OPTIONS FOR MANAGING HOUSEHOLD HAZARDOUS WASTES

IN

SOUTHEAST ALASKA

I. Introduction and Background

When household hazardous wastes are improperly disposed of in the general solid waste stream, they can result in a number of environmental and public health problems. If improperly landfilled, they can contaminate landfill leachate, which in turn can pollute surface, ground, and drinking water. If improperly incinerated, they can adversely affect air quality by releasing toxic chemicals. In addition, they can create safety hazards for sanitation workers who collect and transfer refuse. Finally, storage of these chemicals in homes is also hazardous, especially in the event of fire, and pouring them down drains can damage private on-lot and municipal sewage systems. A growing awareness of these problems by local governments has led many to implement specific management schemes for properly collecting and disposing of these wastes.

The purpose of this report has been to assist the Southeast Conference Solid Waste Management Committee in its efforts to formulate a management plan for collecting and disposing of household hazardous waste (HHW) in Southeast Alaska. The report addresses several topics related to developing such a management plan:

* The present regulatory environment affecting HHW management;
* The amount and types of HHW that would most likely be collected;
* Specific collection alternatives that might be viable for the Southeast;
* The advantages and disadvantages of these alternatives;
* The approximate costs of the alternatives; and
* Possible funding mechanisms for a collection system.

The report concludes that, despite the unique characteristics of the Southeast region, there are several potentially feasible HHW management alternatives which, if implemented, would result in more comprehensive and thorough collection and disposal of the region's HHW.

II. Regulatory Framework

There is no formal statutory definition of HHW in the Federal hazardous waste regulations. A definition can be implied, however, by combining the definitions of household waste and hazardous waste as they are defined in the Resource Conservation and Recovery Act (RCRA). Using this method, a HHW is a solid, liquid, or gaseous substance generated by a household that exhibits the characteristics of ignitability, corrosivity, reactivity, or EP toxicity, or is specifically listed under RCRA as a hazardous waste. Products which are examples of HHW are drain openers; oven cleaners; oil and fuel additives; grease and rust solvents; paint thinners; adhesives; herbicides; pesticides; fungicides; and wood preservatives.

Under RCRA, HHW is exempt from regulation and can be legally disposed of in any solid waste disposal facility. This exemption applies even when the waste is accumulated in large quantities, as would be the case with a collection program. EPA strongly endorses HHW collection and management programs; and, although technically exempt from RCRA regulation, recommends collected wastes be managed as though they were not exempt.[1]

In contrast with RCRA, the other major Federal statute regulating hazardous wastes, the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), does not contain a liability exclusion for household wastes, or for the amount of waste generated. Any waste that qualifies as a hazardous substance under CERCLA is subject to its liability provisions.[2] Communities are, therefore, subject to financial liability for any environmental damage caused by the release of HHW. This liability exists regardless of whether the waste is collected as part of a community's routine waste collection service and disposed of in a municipal solid waste landfill, or collected as part of a special waste management system and taken to a hazardous waste landfill. HHW management systems can reduce a municipality's risk of liability under CERCLA by reducing the likelihood that these wastes would cause environmental problems, since HHW that is collected and disposed of under RCRA hazardous waste standards is much less likely to cause environmental problems than HHW that is not.

III. Department of Environmental Conservation Collection Program

To date, Southeast Alaska has relied on the Department of Environmental Conservation (DEC) Household Hazardous Waste Spring Clean-up Program to manage its HHW. DEC began the program in 1983, and since the program's inception has collected 462 tons of waste at an approximate cost of $1.3 million dollars. Except for 1983 and 1988, Juneau has hosted events ever since the program began, with 317 drums of waste being collected. Events were held in Ketchikan in 1986, 1988, and 1990, with 49 drums of waste collected. As of last year, the only other community in the Southeast to conduct a clean-up event is Sitka, which collected 41 drums of waste in 1989.

The program has been extremely successful, as measured by both the amount of waste collected and the public's heightened awareness of the issue and demand for the service. When the program began, the state covered the full program costs. The state's financial contribution has steadily declined over time, however, and now makes up only 36 percent of the total, with the rest of the cost being paid by local governments. The ultimate goal of the program is to have communities develop their own autonomous HHW programs as a facet of their overall waste management plans.

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[1] In other words, in full compliance with Federal RCRA Subtitle C hazardous waste regulations.

[2] As defined under Section 107. Hazardous substances are defined under Section 101(14) and designated under Section 102(a). HHW may qualify as a hazardous substance if it contains any substance listed in Table 302.4 of 40 CFR Part 302.

IV. Collection and Composition Estimates

One of the first steps that must be taken in developing a more comprehensive HHW management plan for Southeast is determining how much waste there is to manage. According to the methodology used in this report, it is estimated that approximately 400 drums of waste would be collected annually. It is likely that three quarters of this waste would be classified as ignitable waste, and of this over a quarter would be waste oil.[3]

In the appendix are monthly loading and composition tables which breakdown this estimate down by month, community, and waste class (Also included is a discussion of the assumptions and limitations of the analysis).

V. Management Options

This project analyzed three distinct management alternatives:

* Expanded clean-up days, which would involve expanding the present system of periodic clean-up events to provide more regular service and include more communities;

* Depots plus collection days, which would create permanent, year-round collection centers at the larger communities, and service the smaller communities with periodic clean-up events; and

* A mobile collection system, which would involve investing in a mobile collection facility which would routinely travel throughout the Southeast collecting wastes from communities.

This is not an exhaustive assessment of the management alternatives available to Southeast Alaska; these three alternatives were selected for review because they provide a representative range of options appropriate for the geography and waste generation levels of the region.[4] Each of these options will be described below, along with a description of their specific advantages and disadvantages.

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[3] The composition of the waste stream was estimated based on an analysis of manifests from past clean-up events on the Kenai Peninsula. These proportions were then applied to the amounts of waste estimated likely to be collected in S.E. Alaska.

[4] For example, one option not reviewed was creation of a permitted hazardous waste disposal facility. Such a facility also would accept wastes from large scale industrial generators, and would likely cost millions of dollars and require years of lead time to build. It would also not resolve Southeast Alaska's problem, since some kind of collection system like those described would still be required. An in region facility would just change the end destination of the collected wastes.

A. Expanded Clean-up Days

Description

Expansion of the clean-up day program is the most straight forward of the management options. It would involve contracting with a private firm to conduct clean-up events at prearranged sites throughout Southeast Alaska. Each event typically would involve two to three days of actual collection, with an additional day or two of processing the wastes for shipment. Events would be held at public places such as firehouses, school yards, sewage treatment plants, or other locations that are both accessible and have adequate space. This is essentially an expansion of the existing DEC program.

Given the relatively high fixed costs for these events, if the event is extremely successful in terms of the amount of waste collected, the total cost will be higher than for a less successful event, but the average cost per drum will be lower. Conversely, even if the event is a total failure and no waste is collected, there will still be an obligation to pay the base price. Cost overruns are a common problem with clean-up events, since it is difficult to judge accurately how much waste will be collected, and the trend is for more waste to show up rather than less than was planned for. For these events to be successful, effective advance publicity is, therefore, especially critical, and having sufficient funds to pay for waste greater than anticipated is often a necessity.

Advantages

Expansion of the clean-up day program would require no capital investment (i.e., purchasing of equipment or facilities), and the clean-up days could be purchased incrementally, buying as few or as many as funding allowed. This option would burden local government staff resources the least, and would require the least amount of planning and coordination among the communities. The contractor could assume responsibility for the entire event, including securing a location, providing adequate publicity, and actually collecting and processing the wastes. Under this option, local governments would also probably incur the least risk of liability for any accidents or other problems.

Disadvantages

Of the options presented, expansion of a clean-up program least resembles a genuine management system. It requires no long-term commitment; there are no economies of scale to its expansion; and there is a danger that it could atrophy back into a few sporadic, isolated events as funding permits. In addition, this option probably would provide the fewest days of collection, would likely collect the least amount of waste, and would cost the most per collection day.

Other Considerations

In the past, DEC has acted as a contract vehicle for events and provided some funding. In the future, it could be anticipated that DEC would still provide some funding, particularly to communities that have not yet hosted clean-up events, although it may do

so in the form of grants. This is at least partly due to legal problems arising from the structure of clean-up event contracts.

B. Collection Depots plus Clean-up Days

Description

There are two parts to this alternative: routine collection of HHW at specially constructed, prefabricated storage depots, most likely located at existing solid waste landfills; and periodic clean-up days at smaller communities which do not generate enough waste to make a depot a practical option. According to the collection estimates developed for this report, the only communities which produce enough waste to justify collection depots are Juneau, Ketchikan, and Sitka; it does not appear that the other communities produce enough waste to make a depot a workable option at this time.[5]

A number of local governments in Alaska are operating, or are planning to operate, collection depots. There is a depot in operation in the city of Anchorage which acts as a transfer station for the Eagle River Hazardous Waste Facility. Depots sites are under construction in Soldotna, Kenai, and Homer as part of the Kenai Peninsula Borough's plan for managing HHW. Juneau and Ketchikan are also considering depots.

A depot consists of a specially constructed building, fully equipped with all the required ventilation, compartmentalization, heating, fire suppression, and safety equipment. Installing a depot involves constructing a concrete slab for the building and reception area; providing water and electrical connections; and providing adequate fencing and security. For the present analysis, it was assumed the each of the three depots would operate eight months of the year, and be closed during the winter months (due to low waste volumes and weather). The facilities would be staffed three days per week, with two days allocated to collection and one for processing.

Prefabricated depots can be purchased in different sizes, with capacities ranging from approximately twenty to sixty drums. In the present analysis, it was assumed that an approximately forty drum unit would be used, as this is the capacity of the shipping containers that would be used to transport the wastes to Seattle for treatment and disposal. It is most cost effective to ship full container loads of waste, since shipping costs are a significant portion of disposal costs, and the barge lines charge full tariff whether or not the shipping container is completely full. If costs are to be minimized, the transfer frequency from depot to the treatment and disposal facility will be determined by how long it takes to aggregate forty drums of waste to fill a shipping container. Communities may, however, place a greater value on minimizing waste storage time, in

[5] This judgement is based on the fact that, over the course of an entire year, the next largest community (Petersburg) would produce only enough waste to fill half a mid-sized depot. While a smaller depot could be purchased, this would not significantly affect costs, since the capital cost savings of a small depot relative to a large one are insignificant and the operating costs (except for the costs of waste disposal) would be the same.

which case they might elect to transfer the wastes prior to aggregating a full shipping container (e.g., monthly, bimonthly).

For smaller communities which fail to generate enough wastes to make a depot viable, clean-up day service would be contracted for four times per year, with each event lasting two days.

Advantages

Overall, this option provides the most days of actual collection, although they are concentrated in the communities with the depots. Residents would probably find the depot service the most accessible and convenient. The service would also be the most stable and predictable, meaning awareness and recognition of the service would build over time, reducing the need for a continuing publicity campaign. It also means the amount of waste collected would likely increase over time, making this option the most productive of the three.

Disadvantages

The depot concept may involve some additional liability and security issues that need to be addressed. Anchorage has a depot operation analogous to the ones described here which acts as a transfer station for the larger Eagle River facility located outside of town. Anchorage's primary liability concern is that people might drop off wastes at the depot outside of regular operating hours when the station is unattended. A problem could develop with people dropping off acutely hazardous wastes or explosives, or with people leaving wastes in flimsy, leaking, or unmarked containers. This depot is located within the Anchorage solid waste transfer station, which means staff are generally available to spot hazards as they may develop, and the contractor is nearby and can be called anytime to handle problems as they may arise.

Should Southeast Alaska decide to operate depots, provisions will need to be made for this type of dumping, especially if the depot is not located within an attended, secured solid waste landfill or transfer station, and it is left unattended several days a week. In considering this problem, however, one should keep in mind the alternatives -- disposing of the material in the general solid waste stream, home storage, or "midnight" dumping -- which may not be preferable to residents dropping off wastes at a depot outside of regular operating hours. Communities operating depots may wish to purchase insurance coverage protecting them from any potential liability problems, and for communities which presently do not have any insurance covering their landfills or transfer stations, this may involve considerable expense.

There is also the ever present problem of vandalism (e.g., shooting) particularly in remote rural areas. However, the potential for vandalism could be minimized if the depot is adequately marked so that it is clear what its purpose is and that nothing valuable is inside.

Other Considerations

A related option to having depots to manage HHW only at the larger communities involves routinely collecting wastes from smaller communities, transporting it to the depots in the larger communities for storage, and sending it off for disposal with the monthly depot collection. This option was deemed infeasible for Southeast due to the high transaction costs involved with the double handling of the wastes and the high costs of interport shipping (discussed below under the mobile system). If these assumptions are proven false, it may be possible for the depots to act as transfer stations for the smaller communities, with wastes being shipped into them at a cost savings over shipping them to Seattle. Also, as waste volumes build, it may be possible to justify adding additional depots in smaller communities.

Since employees that handle hazardous wastes at a depot site must be adequately trained, equipped, and supervised, it may be preferable that a skilled contractor assume responsibility for this function. This would minimize the liability faced by the municipality.

C. Mobile Collection System

Description

This option is adapted from the extremely successful Wastemobile mobile hazardous waste collection system existing in King County, Washington. The Wastemobile is actually a series of trailers that each contain an electric generator, a water system, a first aid station, protective clothing, portable fencing, and other equipment to allow for HHW collection. Wastemobiles are generally operated by a contractor. Collection sites are typically fire stations, churches, or shopping mall lots, and are staffed by five to seven employees. Users drive up, the waste is removed from the car, and they drive off, with the whole process taking only a few minutes.

Site visits last about two weeks, with the wastes being trucked away nightly and the site secured. The site is open to the public for actual collection three days a week, with the rest of the time spent processing or moving to a new site within the County. During its first six months of operation, the King County system collected over 275 tons of waste.

A system in Alaska could be identical in many respects to King County's Wastemobile, except geared to handle a much lower volume of waste. It would likely consist of a large pickup truck and a fifth wheel trailer that would be self-contained, with all the necessary safety, security, and processing equipment. Site visits would last approximately two weeks; and at the end of each day all wastes would be packed in an approved shipping container, removed from the site, and the site secured.

At the end of a site visit, the wastes (which have been specially packed in drums and then loaded into a shipping container) would be sent to Seattle via barge for recycling, treatment, or disposal. The truck and trailer would then be transported via the regular barge or ferry system to the next site. There should be no problem transporting the system

via ferry or barge, since the system would be completely purged of any hazardous materials at the end of each site visit. At the end of a cycle, the system could be sent to home port in Juneau, where it could be mothballed until ready to begin another cycle.

Advantages

The mobile system combines some of the best features of clean-up events and depots. The unit would contain all the necessary equipment to provide as safe and efficient an environment for waste reception and processing as a depot, and with far less capital investment. Although not providing as many collection days as depots, the mobile system would provide more than the clean-up days option, and they would be evenly distributed throughout Southeast. The system could operate on a regular schedule, building resident awareness and recognition over time. Since the system would move frequently, liability risks from, for example, the dumping of wastes outside regular operating hours would be lower, as would the risks of vandalism.

Disadvantages

Since Southeast Alaska is not interconnected by an extensive road system as is the case with King County, the mobile system would have to be transported by barge or ferry, which complicates matters. This fact implies substantial additional operating costs when compared to the King County operation.

Other Considerations

As with the depot option, although participating local governments would jointly own the equipment, it may be preferable that the unit be professionally operated by a contractor to reduce the liability risks to local governments.

The costs of the mobile system in Southeast Alaska are increased by the low waste volumes which the system may encounter during any particular site visit. Based on the loading analysis prepared for this report (see Appendix), during any given cycle of the mobile system many of the communities would produce only enough waste to fill a small fraction of the barge company's shipping container, which holds approximately forty fifty-five gallon drums. For example, Haines or Craig may have only one or two drums for collection per visit. Since the shipping company will not combine other cargos with hazardous wastes, it does not offer a less than container load price for shipping hazardous wastes. This means the communities would have to pay full price for sending a shipping container to Seattle with only a few drums of waste in it.

One solution to this problem would be to transport the shipping container between ports until enough waste has been collected to fill it, and then shipping the full container to Seattle. This makes sense only if the costs of interport transfer are relatively low, and it does not appear that they are, although the shipping company has not provided a firm rate quote at this time. According to the shipping company, most of the risk in this type of operation is incurred in port, when the containers are being loaded and unloaded, not when sailing on the open seas. This makes the kind of multiple interport transfers of

hazardous cargo that would be necessary to aggregate wastes prior to shipping them to Seattle extremely unattractive to the shipping company.

There are some positive aspects to this potentially unused capacity in the shipping containers. For the communities which have never had this service before, there may be an initial backlog of wastes which exceeds the amounts estimated here. Also, the history of collection programs shows that they tend to become more productive over time, capturing more wastes as the public's awareness of the service, and of the importance of using it, grows. Therefore, particularly over time, there may not be as much unused capacity as was estimated in the present analysis.

VI. Cost Analysis of Management Options

In developing the costs analyses for this paper, data from two general sources was used. Whenever possible, empirical data from existing clean-up programs in Alaska and the state of Washington were used. Where actual data from existing programs was not available, the best professional judgement of people experienced with clean-up programs in Alaska was used. By combining information from these two sources, the cost estimates for each of the options was produced. Detailed breakdowns of the cost estimates, including an explanation of the assumptions used, are included in Appendix B.

The table on the following page presents summary cost data which is useful in comparing each of the management options. It must be stressed that these analyses are preliminary; a more sophisticated analysis might alter the relative economic merits of each of the options, and thus the reader is cautioned against favoring one option over another solely on the basis of cost. The analyses are useful in highlighting the major cost components of each option; how much capital investment each option generally requires; how many collection days it provides and at what cost; and approximate per drum costs based on estimates of wastes collected by each system.

Expanded Clean-up Days

Based on the eight year history of the program, DEC estimates that clean-up events cost approximately $10,000 per collection day.[6] Using this figure, the annual operating expenses of this option are $640,000, and the per drum costs are $1,600. This option requires no capital investment.

Depots Plus Clean-up Days

It is estimated this option will incur total operating expenses of $814,100. This is equivalent to $3,300 per collection day and $2,000 per drum. The total capital cost for all three depots is estimated at $150,000.

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[6]There are typically two costs to a clean-up event contract: A base cost which is fixed, and ranges from $7,000 to $14,000 depending on the location of the event, and unit costs which depend on the amount of waste collected and its type. Unit costs tend to average around $250 per drum, with a low of $50 per drum for waste oil, to over $500 per drum for liquids containing polychlorinated biphenyls.

HOUSEHOLD HAZARDOUS WASTE COST ANALYSIS

COMPARISON OF MANAGEMENT ALTERNATIVES

(dollars)

	Clean-up Days	Depots Plus Clean-up Days	Mobile System
Capital Costs	0	150,000	100,000
Operating Costs	640,000	814,100	515,400

	Clean-up Days	Depots Plus Clean-up Days	Mobile System
Collection Days Per Year	64	250	128
Cost Per Collection Day	10,000	3,300	4,000
Costs Per Drum	1,600	2,000	1,300

Mobile System

Total operating expenses of the mobile system are estimated at $515,400, with a capital investment of $100,000. This is equivalent to $4,000 per collection day and $1,300 per drum.

While drawing conclusions based on the preliminary cost information in this paper is discouraged, some interesting comparisons are possible. The depots plus clean-up days option offers the most days of collection at the lowest cost per collection day. Conversely, the expanded clean-up days option provides by far the fewest days of collection, with the greatest cost per day, and the mobile system falls in between the two. If an adequate contingency margin is allowed for, the per drum costs of the options appear roughly comparable, with mobile system appearing to offer the lowest per drum cost.

VII. Funding Options

There are a variety of mechanisms for funding a management system, including assistance from the State, user fees, and increased fees from garbage collection. DEC is presently rethinking the direction of its Spring Clean-up Program, and may exclude from future events communities that have already hosted clean-up days on the grounds that they need to develop their own autonomous programs. When faced with the loss the clean-up day program, local governments will need to decide how to generate sufficient funding to initiate an appropriate system.

User fees are another funding option. However, since it is generally considered advisable to keep user fees low so as not to discourage use of the system, any user fees would likely only cover a small fraction of the total cost of the system. The Eagle River Hazardous Waste Collection Facility outside Anchorage charges five dollars for a five gallon or forty pound lot of HHW, well below what it costs to manage the wastes.

A method of collecting revenues which would not discourage use of the system is adding a surcharge to each resident's garbage bill. Depending on how a community's garbage service is structured, a fee could be built into the bill which either fully or partially offsets the cost of the system. The three collection depots operated in Homer, Seward, and Soldotna by the Kenai Peninsula Borough are funded in this manner.

VIII. Next Steps for Developing a Management System

This paper has described three management alternatives for properly collecting and disposing of HHW in Southeast Alaska: Expanded clean-up days, collection depots plus clean-up days, and a mobile system. Practical implementation of each of these alternatives appears possible given adequate funding. If providing the greatest number of collection days and maximizing the amount of waste collected is the primary objective, then depots plus collection days would appear to be the best option. If a cooperative collection system

is desired that provides regular service evenly dispersed throughout Southeast Alaska, then the mobile system would be a good choice. If spending the least amount of money is important, or if making long-term funding commitments is difficult, then expanded clean-up days might be the best alternative.

Whatever option appears most promising, additional work still needs to be completed. The cost estimates developed for this report were based on a screening-level analysis. More refined cost estimates need to be developed, particularly if the relative costs of each option are to play an important role in decisionmaking. For example, better information is needed from shipping companies (e.g., Alaska Marine Lines) regarding the costs, logistics, regulations, and practicality of interport transfers of hazardous waste. This information can significantly affect the costs of both the mobile system and depot options, because it would determine whether it is feasible to aggregate wastes between communities or ship wastes from outlying communities into the depots.

Any of the options described here will require funding, and it is therefore important that Southeast Alaska as a region begin serious discussions with the State Legislature and DEC about raising the additional money needed to shift from the present regime of ad-hoc clean-up days to a reliable long-term management system. At the same time, the region should consider what criteria are most important to them in selecting a system. How many days of collection do they want to provide? How much waste do they want to collect? Is it most important to minimize the amount of capital required to get started, or are the annual operating expenses more of a concern? Is minimizing exposure to liability risks most important? Is avoiding long-term funding commitments important, or is it important to avoid the need for close coordination between communities? While funding will play a key role in making a selection, so should answers to question such as these.

APPENDIX A

Collection and Composition Analysis

APPENDIX A

Collection and Composition Analysis

The total quantity of waste likely to be collected by a Southeast regional HHW collection system will greatly influence the choice of optional system design. The original approach taken in preparing this report involved trying to determine the amount of waste generated in Southeast, and then making assumptions about the fraction of that waste that would actually be collected. This approach suffered from a lack of hard data drawn specifically from Alaska; the only data available were broad national averages or studies of communities completely dissimilar to those in Southeast Alaska. An alternative premise (and the one on which the monthly loading analysis table and waste composition table in this paper are based) involves directly estimating the amount of waste likely to be collected, as opposed to the amount generated annually by each household or individual. This information does exist for Alaska, and can be obtained from past DEC clean-up events and the Eagle River Hazardous Waste Collection Facility located near Anchorage. The two tables which follow make use of this empirical data to estimate the volumes of waste likely to be collected in Southeast.

Given the level of analysis, it is not feasible to distinguish between each system in terms of how much waste it would collect, although logically each system would experience different collection efficiencies. The history of HHW collection programs demonstrates that the greater the degree of public accessibility -- in terms of days open for collection and location of the collection site -- and the more routine the program, the more waste will be collected. Applying these criteria to the three systems evaluated, the expanded clean-up days option can be expected to collect the least amount of waste. It provides the fewest days of public access, and is the least routine and predictable. The most productive system would be the depot option, with the mobile system showing a level of collection between the other two options.

It can be expected that the amount of waste a system collects trends upward over time as public recognition and acceptance of the system, and of the importance of properly disposing of these wastes, builds. In addition, population growth may occur over time. These facts suggest that whatever system is deployed, it should be designed with adequate surplus capacity to accommodate additional wastes, or to expand if needed.

The waste composition table provides an analysis of the probable waste stream composition. It is based on an empirical analysis of hazardous waste manifests conducted by DEC from past clean-up events. This information is important, because different disposal costs are associated with different classes of wastes, and because whatever management system is implemented, it must be prepared to cope with the types of wastes it collects. For example, adequate capacity must be provided to allow different waste classes to be properly segregated during storage and shipment.

The waste composition table is broken down into four classes of waste, with ignitable wastes representing the largest class by volume. Within this class, a significant fraction

(over 25 percent) of these wastes is waste oil. Most of the communities of Southeast already have in place separate management alternatives for handling waste oil. To the extent these communities continue to treat waste oil separately and waste oil from households is managed by an existing system other than those described here, the collection estimates overstate the amount of waste likely to be collected by the fraction which is waste oil (25 percent or more).

HOUSEHOLD HAZARDOUS WASTE COLLECTION (1)
Monthly Loading Estimates (2)
(Pounds and Drums) (3)

	Craig		Haines		Juneau		Ketchikan		Sitka		Skagway		Petersburg		Wrangell		Total	
	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums
January	130	0	210	1	2,500	7	1,160	3	710	2	60	0	300	1	230	1	5,300	15
February	80	0	130	0	1,490	4	690	2	430	1	40	0	180	1	140	0	3,180	8
March	190	1	310	1	3,650	11	1,700	5	1,040	3	90	0	430	1	340	1	7,750	23
April	90	0	150	0	1,760	5	820	2	510	2	40	0	210	1	160	1	3,740	11
May	870	3	1,410	4	16,530	49	7,700	23	4,730	14	390	1	1,940	6	1,520	5	35,090	105
June	270	1	430	1	5,040	15	2,350	7	1,440	4	120	0	590	2	470	1	10,710	31
July	300	1	490	1	5,710	17	2,660	8	1,640	5	130	0	670	2	530	2	12,130	36
August	410	1	670	2	7,840	23	3,650	11	2,250	7	190	1	920	3	720	2	16,650	50
September	290	1	470	1	5,470	16	2,550	8	1,570	5	130	4	640	2	500	2	11,620	39
October	210	1	340	1	3,950	12	1,840	5	1,130	3	90	0	460	0	360	1	8,380	23
November	180	1	290	1	3,400	10	1,590	5	970	3	80	0	400	0	310	1	7,220	21
December	180	1	290	1	3,430	10	1,600	5	980	3	80	0	400	0	320	1	7,280	21
Total	3,200	11	5,190	14	60,770	179	28,310	84	17,400	52	1,440	6	7,140	19	5,600	18	129,050	383

(1) The methodology for the collection and compostion estimates was developed by America North, Inc. for the Kenai Peninsula Borough Household Hazardous Waste Collection Facility Program, April 1991.

(2) Assumes 2 lbs of waste per person per year. This rate was derived from empirical data from the Anchorage Collection Facility.

(3) Pounds rounded to nearest tenth; drums to nearest whole drum.

HOUSEHOLD HAZARDOUS WASTE COLLECTION
Annual Composition Estimates (1)
(Pounds and Drums) (2)

	Craig		Haines		Juneau		Ketchikan		Sitka		Skagway		Petersburg		Wrangell		Total	
	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums	lbs	drums
Poisons/ORM (3)	290	1	470	2	5,470	22	2,550	10	1,570	6	130	1	690	3	500	2	11,670	47
Corrosives (4)	130	0	210	1	2,430	7	1,130	3	700	2	60	0	310	1	220	1	5,190	15
Ignitables	2,710	8	4,400	13	51,640	148	24,070	69	14,790	42	1,200	3	6,490	19	4,740	14	110,040	316
Oxidizers/ Peroxides	30	0	50	0	610	2	280	1	170	1	10	0	80	0	60	0	1,290	4
Total	3,160	9	5,130	16	60,150	179	28,030	83	17,230	51	1,400	4	7,570	23	5,520	17	128,190	382

(1) Based on analysis of spring clean-up manifests from Kenai Peninsula.

(2) Pounds rounded to nearest tenth; drums to nearest whole drum.

(3) Poisons/ORM converted at 250 lbs per drum plus 100 lbs of absorbent.

(4) Corrosives/Ignitables converted at 50 gallons of liquid at 7 lbs per gallon.

APPENDIX B

Cost Analysis of Management Options

Capital Costs

TOTAL CAPITAL COSTS	$0

Operating Costs

Contract Cost	
Base cost	
Unit cost	
($10,000/day x 4 events/year x 2 days/event x 8 communities)	
TOTAL OPERATING COSTS	$640,000

Comparison Data

Total Cost per Unit[7]	$1,600/drum
(total operating costs/total drums collected)	
Total Cost per Collection Day	$10,000/day
(total operating costs/total collection days)	

[7]Per unit costs are not expected to be this favorable, since this figure assumes each system would be equally productive and collect 400 drums, which for reasons discussed in the text would not likely be the case. The clean-up days option would probably collect the least amount of waste.

Capital Costs		
Prefabricated Storage Sheds	(3 @ $30,000)	
Shipping Costs	(3 @ $5,000)	
Site Preparation	(3 @ $10,000)	
Equipment	(3 @ $5,000)	
TOTAL CAPITAL COSTS		$150,000
Operating Costs		
Labor Costs	(8 hrs/day x 3 days/week x 8 months/year)	
site supervisor	(3 @ $65/hr)	
technician	(3 @ $45/hr)	
Total Labor Costs		$274,600
Transportation/Disposal Costs		
drums	(315 drums x $300/drum)	
Total Transportation/Disposal Costs		$94,500
Other Costs		
publicity	(3 @ $5,000)	
consumables	(3 @ $10,000)	
Total Other Costs		$45,000
Clean-up Events		
(4 events/year/community x 2 days/event x 5 communities x $10,000/day)		
Total Clean-up Events Cost		$400,000
TOTAL OPERATING COSTS[8]		$814,100

[8] This figure does not include liability insurance coverage as inadequate data precludes a reasonable estimate. Much of the liability risk would presumably be borne by the contractor operating the depot. Sitka indicated its insurance company would require it to buy a comprehensive policy to get this type of coverage, costing between $50,000 and $100,000 annually. It's logical to assume costs would vary greatly depending on the insurance company and community.

Comparison Data

Total Cost per Unit	$2,000/drum
(total operating costs/total drums collected)	
Total Cost per Collection Day	$3,300/day

$$\frac{\text{total operating costs}}{(20 \text{ events} \times 2 \text{ days/event}) + (2 \text{ days/week} \times 35 \text{ weeks/year} \times 3 \text{ depots})}$$

Capital Costs		
Collection Vehicle and Equipment[9]		$100,000
TOTAL CAPITAL COSTS		$100,000
Operating Costs		
Labor Costs	(10 hrs/day x 4 days/week x 8 months/year)	
site supervisor	($65/hr)	
2 technicians	($45/hr)	
per diem	($120/day x 4 days/weeks x 8 months/year x 3 people)	
Total Labor Costs		$267,400
Shipping Costs		
Seattle	(32 shipments x $3,000/shipment)	
Total Shipping Costs		$96,000
Disposal Costs		
drums	(400 drums x $300/drum)	
Total Disposal Costs		120,000
Other Costs		
publicity	($5,000/year)	
air travel	($15,000/year)	
consumables	($12,000/year)	
Total Other Costs		$32,000
TOTAL OPERATING COSTS		$515,400
Comparison Data		
Total Cost per Unit		$1,300/drum
(total operating costs/total drums collected)		
Total Cost per Collection Day		$4,000/day
(total operating costs / 4 days/cycle x 4 cycles/year x 8 communities)		

[9]This figure is based off the capital costs of King County's mobile system. This is a conservative estimate, in that the King County system is designed to handle significantly greater volumes of waste, and is more elaborate than would probably be needed in the Southeast

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