

## Technology Brief

# Urban Recycled Wood Characterization Study

### Introduction

The amount of urban wood waste recycled in Washington State has increased over the last several years. A large fraction of the urban wood being recycled is “clean” wood waste and consists primarily of mill residuals, land clearing debris, and pallets and crates. A smaller quantity of construction and demolition wood waste is recycled. Considerable success has been achieved in developing end uses and markets for this material in the pulp and paper and composite wood manufacturing industries. However, market development has been curtailed by a poor understanding of product quality, end user requirements, perception about demolition wood, and regulatory constraints.

The Clean Washington Center (CWC) contracted with E&A Environmental Consultants, Inc. of Bothell, Washington, and Heartwood Consulting to study the constraints for developing markets for urban recycled wood (URW).

### Project Description

The project surveyed potential end users of urban recycled wood (URW) in the industries of composite wood, pulp and paper, and biomass energy. The intent of the survey was to: (1) determine end use specifications for use of URW as a biomass fuel and feedstock for pulp and paper composite manufacturing; (2) characterize URW produced by four processors in Washington State; and (3) convene end user discussion groups with end user industry representatives.



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### Key Words

**Materials:** Urban Recycled Wood (URW)

**Applications:** Pulp and Paper, Composite Wood Manufacturing industries, Biomass Fuel

**Market Goals:** Development of URW as a biomass fuel, manufacturing feedstock, or other end use

**Abstract:** Opportunities to develop end uses and markets for urban recycled wood

The URW characterization component of the project involved collecting and characterizing URW samples from four processing facilities. The samples were analyzed for inert contaminants (plastic, metal, painted wood, etc.), sieve analysis, moisture, ash, heat energy, and trace metal content. The results were analyzed to determine feedstock variability, potential methods for improving the quality of the product, and how well the various URW products met end use specifications

### Project Results

Project results indicated that many facilities had some experience using URW as a biomass fuel or manufacturing feedstock. Specifications and technical requirements for using URW as a biomass fuel are less stringent than for manufacturing end uses. Consequently, this market has been the easiest to access. A majority of the recovered URW is placed in this market and the end users seem satisfied with the

quality and performance of the product. Based on the survey, the market for biomass fuel is expanding and should provide a stable market for URW in the future.

Few of the facilities use URW as a manufacturing feedstock because of the low cost of virgin fiber that is available, but indicated that URW would be an important source of fiber in the future. Respondents who had used URW as a manufacturing feedstock experienced problems with excess contamination.

Specifications and technical requirements for URW as a manufacturing feedstock are more stringent than as a biomass fuel. This has made it more difficult for URW processors to place materials in this market.

## Conclusions

Since URW was first used as a manufacturing feedstock, processors still in the business have made modifications to their manufacturing process and have learned how to better use this material. Consequently, they are producing a clean, consistent product.

However, the presence of contaminants is a significant issue for all the facilities surveyed. Contaminants in URW can cause additional costs through equipment wear and breakage, inferior product quality, and product recall.

The results of this project will increase the competitiveness of wood waste products by:

- Helping processors understand the characteristics of their product relative to the specifications and constraints of the marketplace;

- Providing processors with technical and market information needed to initiate processing or increase processing capacity;
- Providing end users with feedstock quality data; and
- Providing regulatory officials with technical information that will encourage the development of sensible regulations.

In order for this market to remain viable, URW processors need to work closely with the end user to provide a product that meets their requirements. In addition, the price differential between URW and virgin feedstocks must be large enough to account for the additional equipment wear, product down time, and general difficulties associated with processing this material.

This technology brief was prepared by the **Clean Washington Center**. The Clean Washington Center is the Managing Partner of the **Recycling Technology Assistance Partnership (ReTAP)**. ReTAP's mission is to advance industry's use of recycled materials through technology extension services. ReTAP is an affiliate of the national Manufacturing Extension Partnership (MEP), a program of the U.S. Commerce Department's National Institute of Standards and Technology. ReTAP is also funded by the U.S. Environmental Protection Agency and the American Plastics Council.

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