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Studies in Management and Accounting for the **FOREST PRODUCTS INDUSTRY**

**UNIQUE FINANCIAL REPORTING CONSIDERATIONS FOR
READERS OF FINANCIAL STATEMENTS OF
FOREST PRODUCTS COMPANIES**

An Update of Monograph Number 25

**Patricia M. Bedient
Russell S. Pattee**

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Patricia M. Bedient is a partner in the Pacific Northwest practice of Arthur Andersen. For almost 20 years Patty has served clients in the forest products industry including large publicly traded companies as well as small privately held businesses. In addition to advising clients on matters of financial reporting, she has also served as an expert witness. She is a member of the OSU Forest Research Laboratory Advisory Committee and the Wood Products Advisory board for the World Forestry Center.

Russell S. Pattee is an audit and business advisory manager in the Pacific Northwest practice of Arthur Andersen. He has approximately eight years of public accounting experience, much of that working with clients in the forest products industry. In addition, he is a member of the Oregon Society of Certified Public Accountants and the American Institute of Certified Public Accountants.

UNIQUE FINANCIAL REPORTING CONSIDERATIONS FOR READERS OF FINANCIAL STATEMENTS OF FOREST PRODUCTS COMPANIES

Introduction

This monograph provides an introduction to the accounting and tax concepts of the forest products industry. It is intended for those unfamiliar with the industry who seek only a general orientation or who desire an overview before delving into the detail of specific areas. Primary users would include bankers, investors, accountants and attorneys. The monograph covers common accounting methods and policies, unique financial statement accounts and footnote disclosure.

DISCUSSION OF MAJOR FINANCIAL STATEMENT CAPTIONS

Before beginning a discussion of the financial statements themselves, a word of caution is advised. As with many other industries, any analysis of forest products companies' financial statements is incomplete without a careful reading of the footnotes to the statements. Understanding the accounting methods and policies used to prepare the financial statements is vital. Also, knowing whether consistent methods are used between years is essential to any trend analysis, comparison between years or comparison between companies. This type of information may only be obtained from the footnotes.

Accounts Receivable

Although accounts receivable comprises a large percentage of current assets, reporting

considerations are not significantly different from other industries. Usually sales are made to a variety of customers and, as such, dependence upon one customer as a dominant sales outlet is unusual. Aging for receivables from wood products sales should be relatively current since the selling terms are short. Terms for pulp and paper are generally longer and overseas shipments may extend them further.

Inventory

Inventory includes a variety of raw material components and finished products with major inventory classes consisting of logs, lumber, panels, pulp products, paper and chips. Work in process is usually not material to the balance sheet due to the relatively short production cycle for most products. In the pulp and paper segment, other raw materials, such as chemicals and supplies, may also be significant.

Determination of Physical Quantities

Logs - Logs are defined as trees, or portions thereof, which have been cut down and sawn into usable lengths. Standing trees or timber are carried in a separate balance sheet caption and will be discussed later.

Log quantities are usually measured in terms of "thousand board feet" (MBF), where one board foot is defined as the amount of wood equal to 12" x 12" x 1", or 144 cubic inches. The initial quantity for each log is determined by a scaler based on the length, diameter, defect, taper, etc., of the individual log using recognized scaling rules. Most logs are not counted in inventory until they are scaled. Because most of the scaling is done at the mill or log yard,

logs which are cut but still in the woods are typically not included in inventory. Other common quantity measures are cords and weight. A cord is defined as the amount of wood equal to 4' x 4' x 8'.

Logs scaled in board feet are scaled using a variety of scaling rules used in various regions of the country, and footage will vary depending on the scale used. For example, the Scribner scale is widely used in the West and will normally result in different volumes than the Doyle scale, which is commonly used in the South and Northeast (Doyle generally underscales the Scribner rule below the 24-inch diameter class and overscales above the 24-inch class). In addition, there are other variations of each of these scales. However, the differences in the various scaling rules are reconciled when valuing the inventory. For example, the Doyle scale would result in a lower value per MBF than Scribner when applied to large diameter logs.

Decked logs are the most common form of log inventory, with logs typically decked by species and size. Many companies use a "locked in" deck system for determining quantities. In this system, logs are brought into the yard and scaled into a given deck until the deck has been completed, while quantity for the deck is accumulated from the individual scale tickets. The deck will be left untouched (locked in) until the logs are needed for production. When the deck is fully cut-out, it is compared to the quantity on the perpetual records and the perpetual is adjusted accordingly. This method enables the perpetual inventory to be adjusted as each deck is used without

having to take a physical inventory of the entire yard.

In recent years, many companies have begun to use a tag system to track log inventory. During the scaling process the volume of each log is determined and a tag is affixed to it which indicates the log's volume. When the log is processed, the volume corresponding to the log's tag is relieved from the data base.

A physical inventory of the entire yard of decked logs is usually taken at least once a year. Decks often are inventoried by measuring the dimensions of the deck and applying a conversion factor which converts the cubic volume into the appropriate unit of measure. The conversion factor used depends on the type of log, the average diameter and the amount of defective wood present.

Logs may also be stored in the water using either a raft system or loose within a pond. However, because of environmental concerns, the significance of inventories stored in the water has declined. If a raft system is used, volume is accumulated from the scale tickets as the raft is built. This method is similar to the locked-in deck system in that the volume does not have to be adjusted until the raft is cut-out.

Loose logs in ponds are somewhat harder to measure due to sinkers (logs below the water line) and because there tends to be more airspace between the logs. Usually an overall estimate is made by counting the number of logs and multiplying the total by an average volume per log. Another method is to estimate the percentage of the pond surface

covered by logs. By comparing this to the volume of logs the pond holds when full, an approximate volume can be derived. These estimates are compared to the perpetual records as a check on their reasonableness.

Lumber - Lumber is generally easier to inventory than logs because it is stacked by similar grades, sizes and species. The value of lumber can vary greatly, depending on species and grade. Many companies maintain a perpetual inventory record by using a tag system. A relatively new innovation in keeping perpetual lumber inventories is the use of bar coding on the tags. Bar code readers or "wands" are used to keep track of the movement and disposition of the units of lumber.

Plywood, Reconstituted Panels and Veneer - Softwood veneer and plywood is typically measured in thousand square feet (MSF). However, a square foot for softwood is defined as 12" x 12" x 3/8" or its equivalent cubic volume, while hardwood veneer and plywood are typically based on 1/4" thickness. Other panels such as particleboard (3/4"), medium density fibreboard (3/4") and oriented strand board (3/8") are also measured in MSF based on a given thickness.

Chips - Chips may be by-products produced from portions of the log not used in plywood or lumber production or may be primary products produced by chipping the whole log, as in the case of pulpwood. Chips are generally measured in bone-dry units (BDU's), where one BDU is equivalent to the quantity of wood chips that will weigh 2,400 pounds in an oven-dry condition. Chips are stored in piles,

with quantities maintained in perpetual records based on quantity of chips received, produced and quantity used. These perpetual records are periodically tested by use of aerial survey or ground techniques to estimate the height of the pile and thus determine its approximate cubic volume. However, an important factor in determining chip quantity is the compaction factor, since a higher pile results in more compacted chips. Therefore, once the cubic volume of the pile is known it must be divided by the appropriate compaction factor to determine the approximate number of units.

Pulp and Paper - In addition to logs and chips discussed previously, inventories at pulp and paper mills may include roll stock, baled pulp and paper, wastepaper and a variety of chemicals such as lime and chlorine. Weight (most commonly metric tons) is the most common basis for measurement of pulp, paper and rollstock. A pulp and paper operation also often carries a material inventory of spare parts. When significant, these parts are capitalized.

Inventory Costing and Valuation

Last-in, first-out (LIFO) is the most common method of inventory costing. The reasons for its popularity in this industry are much the same as those found in other manufacturing industries, primarily because the LIFO method of inventory valuation matches current costs with current revenues. Just as important, use of the LIFO method for federal income tax purposes allows companies to deduct these higher costs currently rather than inventorying them in the balance sheet. Internal Revenue

Service regulations prevent companies from using the LIFO method for income tax purposes unless it is also used for financial reporting purposes.

When evaluating a company's financial position or results of operations, one should also consider other impacts which result from use of the LIFO method. Because LIFO charges current costs to the income statement, the costs inventoried in the balance sheet may not be representative of the inventory's current value. This is especially true for a company which has used the LIFO method for a number of years. As a result, working capital or current ratios may not compare favorably to a company using a different inventory valuation method.

The LIFO method will usually result in decreased earnings in times of inflation, again because current costs are charged to the income statement. However, if a company significantly reduces inventory from one year-end to the next, income may be artificially high as a result of charging previous years' lower cost inventory to the income statement. Due to the fluctuation in raw material and labor costs, the average cost of a previous year's LIFO layer may be greater than the current year's costs. In this instance a LIFO liquidation will result in higher costs being charged to the income statement.

Because of the above differences in inventory valuation, it is important to review the footnotes to financial statements. These notes will disclose information regarding the valuation method used, the financial statement impact of any significant LIFO liquidations, and the difference

between LIFO inventory recorded in the balance sheet and what the value would have been using an average cost or first-in, first-out (FIFO) method. (A reader wanting a more detailed discussion of the LIFO method may wish to refer to a separate monograph published by the Oregon State University Colleges of Business and Forestry entitled, "LIFO Inventories in the Forest Products Industry.")

The average cost method of inventory valuation is often used for internal reporting purposes. It is also sometimes used for external reporting but is not as prevalent as LIFO. Average cost is derived by applying a per-unit production cost computed over a given period of time (a month or year) to all units in ending inventory. This calculation is usually very simple and straight forward because most manufacturers have mill operating statements which will provide the per unit costs. Multiplying the unit cost times the number of units in inventory yields the inventory dollar value. However, the simplicity of the calculation can also lead to distortions. For example, the per unit average cost is usually applied to all units in inventory regardless of end-product value. If the mix of the production period is not comparable to the mix of ending inventory, the cost may not be representative. In addition, costs incurred throughout the year can be very seasonal and subject to fluctuation. Logging costs, for example, can vary greatly depending upon the terrain or weather. For this reason, many companies use an annual average cost rather than a monthly cost in order to minimize these swings. Alternatively, for

purposes of calculation, certain costs may be annualized to prevent these distortions. A more detailed discussion of variations between overall average costs and specific values can be found in a separate monograph titled "A Survey and Analysis of Cost-to-Value Allocation Practices of Solid Wood Product Manufacturing" published in 1993.

The FIFO method of inventory is often used to value supplies or chemical inventories. However, it is not generally used for the more significant components such as logs, chips or finished goods.

Because inventories must be stated at the lower of cost or market under generally accepted accounting principles, comparison of inventory carrying values to net realizable value ("NRV") is necessary. An NRV test is especially important in the wood products industry and in wood related pools of paper companies because of volatile selling prices.

Although the LIFO method is used primarily for tax-saving purposes, LIFO inventories also must be reduced to the lower of cost or market for financial reporting purposes. Most forest products companies compute market value by pricing their inventories at the current market prices by grade and species; the sum of these is reduced by sales discounts, shipping and selling costs, and any costs to complete. This NRV is then compared with the carrying value of the inventory to determine if a market write-down is required.

Joint-Products and By-Products

Joint-products and by-products occur in many stages of wood products operations. Joint-products are defined as those products which are produced simultaneously from the same raw material and which have significant economic value. In contrast, by-products are usually of minor or incidental value.

The problem of assigning costs to joint-products begins with the harvest of timber. Logs produced from a given tract may vary considerably in value depending on whether they are pulp logs, sawmill logs or peeler logs. The problem arises as to how the cost of timber should be assigned to the logs produced. The costs of logging and hauling the logs to the point of manufacture are also joint costs, but the joint cost problem does not end with the delivery of logs to the mill.

A sawmill operator derives products of varying grades from each log. Also, the plywood manufacturer is confronted with a similar problem since varying quantities of "face stock" and "core stock" will be obtained from the logs. Although joint-products are frequently produced, the method of allocating costs to these products is not very scientific. The most common practice is to assign an overall average cost of raw material to the end products regardless of the varying sales realization for each product. (See previous reference to the cost-to-value allocations monograph.)

Typical by-products found in the industry include bark, chips, sawdust and shavings and these may be used internally by the operation. For

example, bark is often burned to generate power for running the mill. Revenue from by-product sales are often credited directly to cost of sales, to sales or reflected as a reduction in inventoriable cost. If by-product revenue is credited directly to sales or cost of sales, the effect on net income will be the same. However, if it is reflected as an offset to inventoriable cost, net income will differ depending on changes in inventory volume.

A product, by definition, may change from a by-product to a joint-product depending on market conditions. A prime example of this is the production of wood chips, which, historically, were treated as a by-product with little cost assigned to them. However, the relative value of chips has occasionally increased such that logs normally sawn into lumber, as well as low grade lumber, are instead converted to chips. Chip income has become a significant factor for many mill operations.

Property Plant and Equipment

Due to the capital intensive nature of the forest products industry, fixed assets and related depreciation are significant financial statement accounts.

Depreciation is typically calculated on a service-life basis using either a set time period or unit-of-production method. Because of the cyclical nature of the industry, the unit-of-production method has gained popularity. Depreciation rates are usually calculated on broad asset classifications as opposed to separate rates for each individual piece of equipment.

It is common practice for mills to perform major maintenance or repairs during a one or two week shutdown period each year. Repairs which significantly extend the life or productivity of the asset are usually capitalized. In addition, maintenance costs incurred as part of the annual shutdown period are often annualized (i.e., the income effect is spread out to all months during the year) for interim reporting purposes.

When a company brings a new plant on stream or has major expansion of an existing facility, start-up costs are often incurred. Many companies defer these costs and amortize them over a period not to exceed the life of the asset. Such deferral is proper under the theory of matching costs with the related revenue to be generated. Costs may include testing or debugging the system, training a new labor force, etc. The point at which start-up costs should no longer be deferred is somewhat subjective. However, no costs should be deferred if production or operating results are less than normal due to factors which are not production related (i.e., poor markets).

During significant construction projects, interest is computed on the outstanding construction balance and capitalized as a cost of the project.

Timber and Timberland

Timber is defined as growing trees. There are two basic methods of securing a timber supply: outright ownership and cutting contracts.

Fee Timber

Timber that is owned outright is often referred to as fee timber. A fee timber holder has a deed to the land as well as the timber. A major advantage of fee timber is control of a timber supply and increased self-sufficiency. Historical cost reported in financial statements varies widely, depending on the year of acquisition. Therefore, in evaluating the fee timber dollar amount it is important to know the volume and species it represents. In addition, because timber is a renewable resource, timber volume acquired years ago will have increased through growth unless there has been significant cutting.

Timber and the related timberland is reported on the balance sheet (generally as a noncurrent asset) at original purchase cost less depletion (referred to as Cost of Timber Harvested or COTH), usually immediately before or after Property, Plant and Equipment. Generally, no portion of the asset is considered to be a current asset, even though it may be fairly certain that some portion of the timber will be harvested in the coming year. However, in recent years, there has been a trend to classify timber to be harvested within the coming year as current in cases where the timber was recently acquired with debt that has a corresponding current portion. Carrying costs such as property taxes, insurance, interest and insect control usually are expensed as incurred. Reforestation costs (which may include cost of seeds, seedlings, nurseries, site preparation and fertilization) may be capitalized as part of the timber account or expensed, depending on whether the cost

incurred has a long-term benefit (in which case it is capitalized) or a short-term benefit (in which case it is expensed).

Cutting Contracts

A cutting contract is a contractual agreement giving the company the right to cut timber in a specified location, at a specified price, within a designated period of time. There are two major categories of cutting contracts. One category is referred to as "pay-as-cut." This contract specifies a rate paid per MBF cut and per timber species. The second category is referred to as "lump-sum." Under a lump-sum contract, the buyer pays a designated fixed amount for the right to cut all timber on a given tract of land. There is usually no guarantee of volume and as a result it is extremely important to have an accurate estimate of the amount of timber on the tract prior to settling on a price.

Many contracts require advance deposits. As timber is removed its value is applied against the deposit. Also, as the deposit is used the buyer is required to make additional deposits.

From the buyer's perspective, acquisition of timber cutting rights can sometimes be a means of increasing timber supply without increasing liabilities on the balance sheet, since many of these contracts are not recorded as assets or liabilities. Additionally, although advance deposits or bonds may be required, cutting contracts are, to some degree, self-financing since complete payment is not required until harvest. A major advantage from the

seller's perspective is that agreements can be structured so that the seller retains an economic interest in the timber, thereby deferring payment of capital gains tax until the timber is actually cut.

The primary source of timber sold under cutting contracts in the West is the Federal government, which has vast timber holdings. The U.S. Forest Service manages and sells timber in National Forests, while the Bureau of Land Management controls and sells timber on public domain lands. In addition, timber is sold by a variety of state governments under cutting contracts. Most government agencies sell timber at public auction. The timber is sold to the highest bidder, which is determined by multiplying the rates bid per species by the volume estimated by the agency. As discussed before, the agency does not guarantee the volume actually cut. These contracts may also include clauses for changes in prices to be paid based on fluctuation of end-product prices, referred to as escalation and de-escalation. The timber must be cut within the time period specified in the contract, although extensions have been granted in certain cases. Discounts are also sometimes given for early harvesting.

There are many other variations of timber acquisition methods, including timber deeds, timber leases and exchanges. These transactions usually take place between private parties and are more common in the South where most of the timber is owned by private land holders rather than the government.

Although cutting contracts vary, they are generally recorded using one of two basic methods. If the risk of ownership is with the buyer, then the transaction is recorded as a purchase with the quantifiable amount of the commitment recorded as an asset and a liability. However, if the risk of ownership is with the seller and title does not pass to the buyer until the timber is cut, the cutting contract is recorded as a purchase of inventory and liability as the timber is cut.

Advance deposits on cutting contracts usually are recorded as an asset and credited to reflect payment for timber as it is cut. These deposits are classified in the balance sheet in many different ways. Some companies believe that a deposit may have a current and noncurrent portion. The portion that will be used to offset timber removals within one year is classified as current; the portion that will not be utilized within one year is noncurrent. Some companies classify the entire amount of the deposit as part of the timber account and disclose that policy. When advance deposits are made to ensure that the buyer performs in accordance with the contract and the deposits remain outstanding for the full term of the contract, they are usually classified as a noncurrent asset.

On individual contracts it is common for the value of timber removed to exceed the advance deposit at some point in time. When this occurs a liability is set up, normally as a current liability within accounts payable.

Cost of Timber Harvested

The charge for cost of timber harvested is based on a unit of production concept. The total cost of the timber is divided by the total estimated recoverable volume of timber, resulting in a per unit charge (usually expressed in terms of thousand board feet). There is no single generally accepted method of computing the cost of timber harvested within the industry. Some of the more common methods include:

A single composite rate for all timber owned, representing a cumulative average of all acquisitions. This is a common method among small and medium sized companies whose timber holdings are located in one general area.

Separate composite rates for each major block of timber constituting an operating or management unit. Here again, the rates are cumulative averages of all acquisitions making up the block. This method is frequently found in large companies having major timber holdings spread over a wide area with each block supplying separate mills. The blocks may also be distinguished by differences in the primary species.

Separate rates for each individual tract based upon the acquisition cost of the particular tract. This method may result in substantial variation in the cost of logs of similar species and quality, depending on the particular tract from which they are cut.

Sustained yield concept. Some companies are able to manage their timberlands on a sustained yield basis whereby the timber resource is continually renewed through reforestation and residual growth, such that the growth equals the amount of timber harvested for a given period. Under such conditions, cost of timber harvested may be computed by dividing the original purchase price of the timber, plus reforestation costs incurred and expected to be incurred during the growth cycle, by the projected footage which will be available during the growth cycle.

Roads and Road Amortization

Logging roads are constructed to provide access to the timber which is to be harvested. Such costs can be significant depending on the terrain and length of road. Roads which serve large areas and will be in use until all the timber in a given tract is logged are referred to as mainline roads. The costs of building mainline roads are usually capitalized and amortized as the timber is harvested. The costs of branch or spur roads that serve relatively small areas and will only be used for one logging season are often charged to expenses as incurred. Capitalized road costs are reported either in the property caption or timber caption on the balance sheet.

Income Taxes

Prior to 1986, many forest products companies had effective tax rates which were lower than the statutory ordinary tax rate. The primary reasons were the investment tax

credit on asset purchases and a special provision (Section 631) which allows, under certain circumstances, the harvesting or disposal of timber with a retained economic interest to result in the realization of income taxable at the capital gains tax rate (which was lower than the ordinary tax rate). However, the Tax Reform Act of 1986 eliminated the investment tax credit and made the capital gains and ordinary tax rates generally equal. The distinction between capital gains and ordinary income was retained, allowing for possible restoration of capital gains benefits at some future date. Many companies have elected out of Section 631 to simplify recordkeeping since there is currently no rate benefit. In the meantime, the distinction is important because the limitations on capital loss utilization remain in the law, notwithstanding the changes in the structure of individual and corporate tax rates. A short discussion of Section 631 follows since many companies may elect back into Section 631 if the capital gains tax rate is lowered in the future.

Section 631(a) allows taxpayers who harvest timber to elect to recognize capital gain on the difference between the timber's tax basis and fair market value as of the beginning of the year in which it is cut. Under 631(a), taxpayers recognize capital gain whether they sell the timber or first process the timber through conversion facilities. Thus, a Section 631(a) election results in the recharacterization of ordinary income to capital gain.

Section 631(b) provides that certain timber owners who dispose of timber

while retaining an "economic interest" in it, as in a long-term cutting contract, can receive capital gain treatment. Prior to the enactment of this provision, the Internal Revenue Service took the position that timber was inventory when sold under such long-term agreements, the result of which is ordinary income rather than capital gain. Section 631(b) is not elective.

Timber that is treated as sold under Section 631(a) is depleted. Timber that is disposed of under Section 631(b) is not depleted. In lieu of the depletion deduction, the taxpayer uses the depletion basis of the timber to calculate the gain from its disposition.

Other features of the tax law such as Foreign Sales Corporations and accelerated depreciation (due to the capital intensive nature of the industry) are also of great importance to the forest products industry. However, because these provisions are not unique to this industry, they are not discussed here in detail.

DISCLOSURE ITEMS

In addition to disclosures specific to certain financial statement captions, the footnotes to financial statements contain useful information regarding other aspects of a company's financial position or operations.

Commitments and Contingencies

If a company has made significant commitments for capital expenditures or raw materials in the coming year it should be disclosed in the footnotes.

This type of information is valuable in assessing cash flow requirements.

As discussed previously, many companies secure a portion of their raw material supply by entering into timber cutting contracts. These contracts will provide valuable insight into the resources available to the company in terms of a fiber supply to operate its mills. In addition, due to the cyclical nature of end-product prices in the industry, these contracts may contain inherent losses if converted and sold at current market prices. Often these losses will not be recorded in the financial statements due to the uncertainty of what end-product prices will be when the timber is eventually harvested. However, the footnotes should give information regarding the amount (volume and/or dollars) of timber under contract, the period covered by the contracts, the company's policy for recording losses on these commitments, and whether any significant inherent losses may exist.

If the company is engaged in any litigation which could have a material impact on the company it will be disclosed in the footnotes. Often the company cannot estimate its liability, if any, and therefore nothing will be recorded in the financial statements. However, the footnotes will discuss the range of possible liability and whether or not management has formed an opinion as to its outcome.

Environmental Issues

Currently there are numerous environmental issues affecting the industry. These range from attempts by environmental groups to restrict raw material supply to protect the

environment, to enforcement actions and fines by governmental agencies for violations of environmental regulations such as air or water emission levels. Some of the major issues are discussed below.

The wood products segment of the industry in the Northwest has been negatively impacted by a controversy over habitat for the northern spotted owl and other species. The owl has been designated a "threatened species" and, therefore, the government is considering the preservation of millions of acres of privately and publicly owned old-growth timber for owl habitat. The effect of the controversy has been and will continue to be a severe restriction on available timber supply, causing significant increases in raw material costs. Many mills and companies have been forced to shut down in the late 1980's and early 1990's as these higher raw material costs, coupled with poor lumber and plywood markets, squeezed profits severely. The resolution of this matter and its ultimate effect on timber supply is not known.

The pulp and paper segment of the industry has been negatively impacted by increasingly restrictive air and water emission standards. The most notable of these concerns is dioxin emissions in wastewater. Dioxin is a by-product of the chlorine bleaching process used in many pulp and paper manufacturing facilities. Disputes over the amount of dioxin which may cause cancer in humans and animals have prompted the federal and state governments to reduce allowable emissions levels. Many mills are having to make significant capital expenditures to remain in compliance,

while noncompliance with dioxin and other emissions standards has resulted in fines at some mills.

Segment Reporting

The industry is usually divided into two segments: a wood products segment and a pulp and paper segment. The most significant issue for forest products companies subject to segment reporting requirements (generally, publicly held companies are subject to segment reporting requirements) is the allocation of timber and timberland operations. These operations involve a high degree of integration with the other segments of the company. As a result, timber assets are usually not allocated to any particular segment because identification of specific timber assets with a given segment is not possible. Because any allocation would be arbitrary, the identified asset and capital expenditure disclosures usually do not contain an allocation for timber and timberlands.

SUMMARY

There are many unique financial reporting considerations in the forest products industry. This monograph has hopefully provided the reader with an appreciation for the importance of understanding these unique items and served as a general orientation to financial reporting in this industry. As a source of additional information, a listing of books and periodicals on the forest products industry has been included in the Appendix.

APPENDIX

BOOKS

- Baldwin, Richard F., Operations Management in Forest Products Industry (San Francisco: Miller Freeman Publications, Inc., 1984.).
- Baldwin, Richard F., Plywood Manufacturing Practices (San Francisco: Miller Freeman Publications, Inc., 1975.).
- Britt, Kenneth W., ed., Handbook of Pulp and Paper Technology (New York: Van Nostrand Reinhold Co., 1970.).
- Bromley, William S., Pulpwood Production (Danville, Ill.: The Interstate Printers and Publishers, Inc., 1969.).
- Conway, Steve, Logging Practices (San Francisco: Miller Freeman Publications, Inc., 1976.).
- Conway, Steve, Timber Cutting Practices (San Francisco: Miller Freeman Publications, Inc., 1974.).
- Clark, James d'A., Pulp Technology and Treatment for Paper (San Francisco: Miller Freeman Publications, Inc., 1978.).
- Drushka, Ken, Stumped (Vancouver/Toronto: Douglas & McIntyre, 1985.).
- Hampton, Charles M., Dryland Log Handling and Sorting (San Francisco: Miller Freeman Publications, Inc., 1981.).
- Maloney, Thomas M., Modern Particleboard & Dry-Process Fiberboard Manufacturing (San Francisco: Miller Freeman Publications, Inc., 1977.).
- Rich, Stuart U., Marketing of Forest Products (New York: McGraw-Hill Book Co., 1970.).
- Smith, David Clayton, History of Papermaking in the United States (New York: Lockwood Publishing Co., 1970.).
- United Nations Food and Agriculture Organization, Guide to Planning Pulp and Paper Enterprises (Rome: 1973.).
- Van Derveer, Paul and Kenneth E. Lowe, Fiber Conservation and Utilization (San Francisco: Miller Freeman Publications, Inc., 1975.).
- Wenger, Karl F. (editor), Forestry Handbook (John Wiley & Sons, Inc., 1984.).

Williston, Ed M., Small Log Sawmills (San Francisco: Miller Freeman Publications, Inc., 1976.).

ECONOMIC SURVEYS AND SOURCES OF CURRENT STATISTICS

Agricultural Statistics, U.S. Department of Agriculture, annually.

Contains extensive data on forestlands, timber production, and trade and prices, and some data on pulpwood consumption and pulp and paper production and consumption.

Commodity Yearbook, Commodity Research Bureau, annually.

A compilation of figures for many commodities, including pulp and paper. Included are newsprint production, imports, consumption stocks, wood pulp production stocks and price data.

Crow's Weekly Letter, C.C. Crow Publications, Inc., P.O. Box 25749, Portland, OR 97225.

Forest Products Review, Bureau of Industrial Economics, U.S. Department of Commerce, quarterly.

A compilation of production and trade data for the forest products industry with accompanying analysis of industry conditions and economic outlook.

FORSIM Review -- Lumber and Panel Markets, annually, Resource Information Systems, Inc., 110 Great Road, Bedford MA 01730.

Production, Prices, Employment & Trade in Northwest Forest Industries, quarterly, Pacific Northwest Forest & Range Experiment Station, Forest Service, U.S. Dept. of Agriculture, 809 N.E. 6th Ave., Portland, OR 97232.

Productivity Indexes for Selected Industries, Bureau of Labor Statistics, U.S. Department of Labor, annually.

Contains indexes of output per employee hour and output per employee for sawmills and planing mills, veneer and plywood, pulp, paper and board, folding paperboard boxes, and corrugated and solid fiber boxes.

Pulp and Paper Capacities, United Nations Food and Agriculture Organization, annually.

Contains estimated capacity by country for a five-year period, with capacity estimates broken down by major categories of pulp, paper and board.

Pulp & Paper Review, annually, Resource Information Systems, Inc., 110 Great Road, Bedford, MA 01730.

Random Lengths, Lumber and Plywood Markets Reporting Service, weekly,
P.O. Box 867, Eugene, OR 97440.

Standard and Poor's Industry Surveys: "Paper" and "Building."

Survey divided into two parts: the basic analysis appears about once a year and a current analysis appears several times a year. Designed for the investor in forest products and paper industry stocks. Provides balance sheet and income account data about individual companies and an assessment of the economic position of the industry.

Statistics of Paper and Paperboard, annually, American Paper Institute, 260
Madison Ave., New York, NY 10016.

Timber and Wood Products Information, Clear Vision Associates, 700 Larkspur
Landing Circle, Suite 199, Larkspur, CA 94939.

Yearbook of Forest Products, United Nations Food and Agriculture
Organization, annually.

Contains production and trade data for lumber, wood panels, pulp
wastepaper, and paper and board, reported by country.

DIRECTORIES

Directory of Forest Products Industry, (Biannual), Forest Industries Publication.

Lists information on logging, lumber, plywood and panel operations in the
U.S. and Canada.

Forest Industries North American Fact Book, (Biannual), Miller Freeman
Publications, Inc., 500 Howard St., San Francisco, CA 94105.

International Glossary of Technical Terms for the Pulp and Paper Industry
(1976), Edited by Pulp & Paper International, Miller Freeman Publications,
Inc., 500 Howard St., San Francisco, CA 94105.

International Pulp and Paper Directory, Miller Freeman Publications, Inc.,
annually.

Lists major pulp, paper and paperboard mills worldwide, except in the United
States and Canada.

Kline Guide to the Packaging Industry, Charles H. Kline and Co., Inc., 1980.

Kline Guide to the Paper Industry, Charles H. Kline and Co., Inc., 1980.

Contains a comprehensive analysis of the industry, including economic trends and outlook for shipments, profitability, expenditures and pricing; analysis of major product groups; directory of major companies; and review of specialized information sources.

Lockwood's Directory of the Paper and Allied Trades, Vance Publishing Co., annually.

One of the most comprehensive directories of the industry, listing mills, managers, products and capacities of all pulp and paper mills and converters in the United States and Canada, as well as merchants, exporters and importers, equipment and technical service suppliers and water markets.

Modern Packaging Encyclopedia and Planning Guide, McGraw-Hill, Inc., annually.

A comprehensive guide to marketing, raw materials, equipment and sources of supply, and services in the packaging industry.

Paper and Pulp Mill Guide, Paper Industry Management Association, annually.

Lists sources of supply for machinery, equipment, chemicals and other raw materials, as well as industry statistics.

Paper Yearbook, Harcourt Brace Jovanovich, annually.

Both a paper encyclopedia and a directory of suppliers, providing information on current developments in the trade, paper product lines and sales opportunities. Included are reference charts, tables and data on specifications for military packaging, as well as lists of paper products used by specific types of customers such as accounting firms, advertising agencies and airlines.

Phillips' Paper Trade Directory of the World, S.C. Phillips & Co., London, annually.

Contains a comprehensive listing of paper mills worldwide by country, product, annual capacity and machines used.

Post's Pulp and Paper Directory, Miller Freeman Publications, Inc., annually.

Comprehensive directory of pulp and paper mills and converting plants in the United States and Canada, including product and capacity information. It includes a Buyer's guide section for various types of equipment, chemicals and services.

Pulp & Paper North American Fact Book (Biannual), Miller Freeman Publications, Inc., 500 Howard St., San Francisco, CA 94105.

Walden's ABC Guide and Paper Production Yearbook, Walden-Mott Corp., annually.

Lists names, addresses, personnel, equipment and branch offices of paper manufacturers and converters in the United States and Canada, as well as suppliers and distributors.

Glossary of Packaging Terms, The Packaging Institute, U.S.A., 1979.

In addition to the definitions, contains information on weights and measures, container dimensions and tests for packaging materials.

The Paper Dictionary, American Paper Institute, 3rd edition, 1965.

In addition to the excellent definitions, includes an introductory section on the manufacture, characteristics and end users of the different types of pulp.

Terms of the Trade, Random Lengths Publications, Inc., 1984.

Contains words and phrases used in forestry, logging, manufacturing and marketing.

TRADE PERIODICALS

Forest Industries, Miller Freeman Publications, Inc., monthly.

Key journal that deals with the manufacturing process and economics of the forest products industry.

Forest Products Journal, Forest Products Research Society, monthly.

Contains articles on technical trends in the forest products industry, including some information on marketing and trade patterns.

Official Board Markets, Magazines for Industry, Inc., weekly.

Contains price quotations on specific paper products, as well as industry news briefs.

Packaging Engineering, Cahners Publishing Co., monthly.

Previously called Modern Packaging, contains information on technical aspects of packaging, innovations, regulations and new product lines.

Paper Age, monthly, Business Press Inc., 101 West St., Hillsdale, NJ 07642.

Paper Trade Journal, Lockwood Trade Journal Co., Inc., weekly.

Key journal that deals with the economic aspects of the industry. Extensive price and production statistics published weekly, in addition to articles on manufacturing techniques and economic conditions. The annual review number appearing in February is especially valuable.

Paper Trade Journal, monthly, Vance Publishing Corp., 400 Knightsbridge Pkwy., Lincolnshire, IL 60069.

Pulp and Paper International, Miller Freeman Publications, Inc., monthly.

Contains information on international pulp and paper industry conditions, new manufacturing facilities and technological developments worldwide. The annual statistical issue, usually appearing in July or August, and the annual issue on the Top 100 international companies, appearing in September, are especially valuable sources of information.

Pulp and Paper Week, weekly, Miller Freeman Publications, Inc., 500 Howard St., San Francisco, CA 94105.

Studies in Management and Accounting for the Forest Products Industries, Oregon State University, periodically.

A monograph series published by the Colleges of Business and Forestry that deals with issues in the management of and accounting for enterprises in the forest products industries.

Timber Tax Journal, Forest Industries Committee on Timber Valuation and Taxation, periodically.

Key journal that deals with tax issues affecting the forest products industry.

STUDIES IN MANAGEMENT AND ACCOUNTING IN THE FOREST PRODUCTS INDUSTRY

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<u>No.</u>	<u>Monograph Title</u>
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3	"A Decision Framework for Trading Lumber Futures," (October 1975).
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