



# ONTARIO PAPERBOARD INDUSTRY

## Economic Obsolescence Analysis

As of January 1, 2015

*Prepared for*  
Municipal Property Assessment Corporation

American Appraisal Canada, Inc.  
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Leading / Thinking / Performing

May 19, 2015

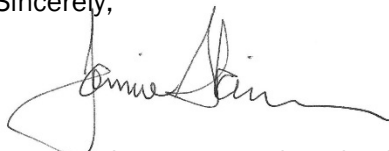
Mr. Paul Campbell  
Director Valuation and Customer Relations, Business Properties  
Municipal Property Assessment Corporation  
1340 Pickering Parkway, Suite 101  
Pickering, ON L1V 0C4

Dear Mr. Campbell:

At your request, American Appraisal Canada, Inc. prepared the attached report concerning the estimation of economic obsolescence in the Ontario paperboard industry as of January 1, 2015. While we understand that our report may be used by MPAC as an input to establish the current value of land as at January 1, 2016, the information required to calculate economic obsolescence at that future date has not yet been revealed. Our report and conclusions can be updated when such information becomes available. Economic events and/or changes in the relative competitiveness of the subject industry between January 1, 2015 and January 1, 2016, may lead to a concluded rate of economic obsolescence different to that cited in this report.

If you have any questions or if there is anything else we can do for you, please contact either of us at 416-593-3409 or 416-593-3408.

Sincerely,



James A. Skinner MBA, CPA, CA, CBV  
Vice President and Senior Managing Director



Michael A. Smith, MBA, CFA, CBV  
Director



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May 19, 2015

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1340 Pickering Parkway, Suite 101  
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**EXECUTIVE SUMMARY**

American Appraisal Canada, Inc. (“American Appraisal”) was retained by the Municipal Property Assessment Corporation (“MPAC”) to complete an economic obsolescence analysis pertaining to the Ontario paperboard industry (the “Industry”) as of January 1, 2015 (the “Effective Date”). We submit our findings in this narrative report.

The purpose of this study was to determine, at the Industry level, if economic obsolescence was applicable to the real property of firms operating in the Industry and to express our estimate of the quantum of any such obsolescence.

It is entirely inappropriate to use this report for any purpose other than the one stated. Only the signed client of record, MPAC, is the intended user of, and may rely on, American Appraisal’s report. No third party shall have the right of reliance on this report, and neither receipt nor possession of the report by any third party shall create any express or implied third-party beneficiary rights.

Based on the information and analysis summarized in this report, it is our view that economic obsolescence in the Ontario paperboard industry at January 1, 2015 was reasonably estimated as follows:

<b>Industry</b>	<b>Economic Obsolescence at Jan. 1, 2015</b>
Ontario Paperboard	7.5%

## INTRODUCTION

### *Purpose and Scope of Work*

MPAC is responsible for classifying and valuing all real property within the Province of Ontario in compliance with the Assessment Act and regulations established by the Government of Ontario. As required by the Province's legislation, assessed value is based on Current Value. The Assessment Act defines Current Value in the following manner:

*"in relation to land, the amount of money the fee simple, if unencumbered, would realize if sold at arm's length by a willing seller to a willing buyer; ("valeur actuelle")"*

This means the price a property might reasonably be expected to sell for, in its current condition, on the open market.

In order to achieve MPAC's desired goal of equitability, the process of Current Value assessment parallels the intent of market value; its objective is to quantify the way in which location, physical characteristics and demand impact the value of a given real property. This is readily achievable when transaction data is available to compare a subject property to similar properties in the same market area. The more unique a property is, however, the more difficult it becomes to achieve and to be seen to achieve the objective of equitability amongst the Province's taxpayers. Current Value assessment of special purpose manufacturing plants, including those operating in the Industry, is particularly challenging because of their inevitable uniqueness.

We understand that MPAC relies upon the cost approach to assess special purpose manufacturing facilities, applied in the following manner:

- i. land value is based on highest and best use as though vacant;
- ii. cost new of improvements is derived using MPAC's Automated Cost System;
- iii. physical depreciation is based upon specific MPAC guidelines; and
- iv. functional obsolescence is estimated using MPAC guidelines.

MPAC has advised American Appraisal that it is contemplating refinement of this determination of value through the inclusion of a deduction for economic obsolescence ("EO"). Accordingly, our analysis resulted in an estimate of the EO that may be broadly present within the Ontario paperboard industry. Our estimate of EO may not be applicable to specific facilities, but has been provided at the Industry level and may or may not apply to individual tax payers.

For purposes of clarity, the paperboard industry is herein defined to include establishments primarily engaged in manufacturing paperboard, establishments that manufacture paperboard in combination with pulp manufacture or paperboard converting facilities, and those primarily engaged in manufacturing paperboard containers such as corrugated and solid fibre boxes from purchased paperboard.

The primary sources of information used in our investigation included the following:

- Statistics Canada;
- Industry Canada;
- North American Wood Fiber Review;
- RISI, Inc.;
- American Forest & Paper Association;
- The Freedonia Group, Inc.
- Standard & Poor's Capital IQ database;
- Standard & Poor's Industry Surveys – Paper & Forest Products;
- Ontario Ministry of Natural Resources and Forestry;
- Board of Governors of the Federal Reserve System;
- United States Census Bureau;
- regulatory filings of publicly traded industry participants; and
- other information as described in the relevant sections of this report.

We understand that MPAC expected, and accordingly we confirm that this analysis was performed, using data and information that was publicly available and that our analysis has been performed without the benefit of inspecting any real property locations in the subject Industry.

### *Economic Obsolescence*

Economic obsolescence, also referred to as external obsolescence, is defined as:

*“a form of depreciation or loss in value of usefulness of a property caused by factors external to the property. These may include such things as the economics of the industry; availability of financing; loss of material and/or labor sources; passage of new legislation; changes in ordinances; increased cost of raw materials, labor or utilities (without an offsetting increase in product price); reduced demand for the product; increased competition; inflation or high interest rates; or similar factors.”<sup>1</sup>*

The economic principles of supply, demand, and competition drive the loss in value associated with EO. Typically, EO cannot be reduced by capital investments, but it can change and even decline to zero through changing economic conditions.

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<sup>1</sup> Valuing Machinery and Equipment: The Fundamentals of Appraising Machinery and Technical Assets, Second Edition, American Society of Appraisers, 2005.

## ECONOMIC CONDITIONS

A sound analysis of economic obsolescence must consider current and prospective economic conditions, in both the national economies in which the subject industry operates, and in the Industry itself. The major variables reviewed in order to evaluate the overall state of a national economy include, among others, the current level of and changes in the real gross domestic product (“GDP”), interest rates, unemployment rates and inflation. Given the impact of both the Canadian and U.S. economies on the Industry analyzed, an overview of those economies for the last several years, as well as a consideration of forecast data follows.

### Canada

#### Gross Domestic Product

GDP measures the value of all final goods and services produced in a given economy. Two measures of GDP are currently quoted, nominal and real GDP. Due to inflationary pressures, nominal GDP will tend to increase over time, thus preventing analysts from obtaining an accurate picture of the overall economy. As a result, a more accurate measure of economic growth is obtained using real GDP. Real GDP removes the effects of inflation from nominal GDP, thereby increasing comparability and consistency.

The following excerpts are from the Bank of Canada’s January 2015 *Monetary Policy Report*.

Oil prices have plummeted over the past six months. Lower oil prices are expected to boost global economic growth while widening the divergences among economies. These developments are taking place against the backdrop of a modest pickup in global growth.

Within this mixed global picture, the main area of strength is the United States, Canada’s largest trading partner. Economic growth in the United States is expected to become increasingly self-sustaining, further propelled by the large positive impact from oil-price declines, despite the drag from the appreciation of the U.S. dollar. In other advanced economies, particularly the euro area and Japan, growth is expected to remain weak despite additional policy stimulus, as the headwinds from deleveraging and uncertainty dissipate gradually. Those headwinds are also expected to temper the positive effects of lower oil prices on advanced economies. In the rest of the world, GDP growth is expected to be held back by the negative effects of lower oil prices on oil-exporting countries; however, growth should strengthen gradually through 2016 as foreign demand in advanced economies picks up and growth-enhancing structural reforms are implemented.

Taking these various countervailing factors into account, the Bank of Canada (the “Bank”) anticipates a pickup in global economic growth to about 3.5% over the next two years.

The oil price shock is occurring against a backdrop of solid and more broadly-based growth in Canada in recent quarters. Outside the energy sector, we are beginning to see the anticipated sequence of increased foreign demand, stronger exports, improved business confidence and



investment, and employment growth. However, there is considerable uncertainty about the speed with which this sequence will evolve and how it will be affected by the drop in oil prices.

Although there is considerable uncertainty around the outlook, the Bank is projecting real GDP growth will slow to about 1.5% and the output gap to widen in the first half of 2015. The negative impact of lower oil prices will gradually be mitigated by a stronger U.S. economy, a weaker Canadian dollar, and the Bank’s monetary policy response. The Bank expects Canada’s economy to gradually strengthen in the second half of this year, with real GDP growth averaging 2.1% in 2015 and 2.4% in 2016. The economy is expected to return to full capacity around the end of 2016, a little later than was expected in October.

Historical and forecast Canadian real GDP growth for 2006 to 2016 (projected) is shown below.

Year	Annual Change (%)
2006	2.8
2007	2.2
2008	0.7
2009	-2.8
2010	3.2
2011	2.5
2012	1.7
2013	2.0
2014*	2.4
2015*	2.1
2016*	2.4

\*Estimated  
Sources: Bank of Canada & Statistics Canada

### Consumer Prices and Inflation Rates

Compiled monthly by Statistics Canada, the Consumer Price Index (“CPI”) tracks retail price inflation (or deflation) for products sold to consumers. The rate of price inflation in the general economy directly influences pricing trends in the consumer goods market.

Both total CPI and core inflation have hovered near 2% in recent quarters, about 1 percentage point higher than a year earlier. The increase in core inflation over the past year is largely due to some sector-specific factors and the temporary effects of a lower Canadian dollar. Even without these factors, there has been a small upward drift in underlying inflation, consistent with the recent trend shown by alternative measures of core inflation.



Core inflation is expected to ease through the middle of 2015 as the temporary boost to inflation from sector-specific factors falls out of the inflation data. Thereafter, core inflation is expected to remain fairly steady, at close to 2 per cent, as the downward pressure arising from excess supply and retail competition gradually dissipates and the upward pressure from the pass through of the depreciation of the dollar fades.

Based on the assumption of oil prices at USD 60, total CPI inflation is projected to fall sharply and to be below the inflation-control range during 2015. Given the magnitude of the shock to oil prices, there is an exceptional amount of uncertainty about the profile for total CPI. For example, if the base-case scenario were to assume that oil prices were 10% higher (lower), total CPI inflation would be higher (lower) by 0.3 percentage points over the coming year.

As the economy reaches and remains at full capacity by around the end of 2016, both core and total CPI are projected to be about 2% on a sustained basis.

Historical and forecast Canadian CPI growth rates for 2006 to 2016 (projected) are shown below.

Year	CPI (%)
2006	2.0
2007	2.2
2008	2.3
2009	0.3
2010	1.8
2011	2.9
2012	1.5
2013	1.2
2014*	2.0
2015*	1.1
2016*	2.1

\*Estimated  
Sources: Statistics Canada and Consensus Economic Forecasts

**Credit Conditions and Interest Rates**

According to the Bank’s *Financial System Review – December 2014*:

The unexpectedly slow global recovery has meant that monetary conditions in advanced economies, including Canada, have been very stimulative for much longer than envisioned in the aftermath of the financial crisis. Interest rate expectations and yields on long-term government bonds in advanced economies have continued to fall since June, reaching near-

historical lows in Japan and the euro area, as the Bank of Japan and the European Central Bank continue to inject exceptional liquidity. Market rates suggest that the first rise in U.S. policy rates has been pushed back to the second half of 2015, in part reflecting concerns about spillovers to the United States from weakened growth prospects elsewhere in the world.

Yields on Canadian long-term government bonds have followed their foreign counterparts: 10-year yields have declined by about 35 basis points since the June FSR and are now only about 35 basis points off their all-time lows. In addition, yields on provincial government bonds have also declined to near-historical lows.

Corporate bond yields remain historically low, as fairly heavy issuance has been met by very strong investor demand. Overall business lending conditions have also continued to ease, owing to strong competition among financial institutions and capital markets.

Borrowing costs for Canadian households remain at very low levels. Interest rates on 5-year mortgages have declined further over the past year, owing to both lower funding costs—proxied by the Canadian-dollar 5-year swap rate—and a 30-basis-point reduction in implied spreads.

The Bank of Canada announced on December 3, 2014 that it was maintaining its target for the overnight rate at 1%. The target for the overnight rate is the average interest rate that the Bank wants to see in the marketplace for one-day (or "overnight") loans between financial institutions. Changes in this rate influence other interest rates, such as those for consumer loans and mortgages. The Bank Rate was correspondingly 1.25% and the deposit rate 0.75%.

## **Unemployment**

According to Statistics Canada, the nation's unemployment rate remained at 6.6% in December, as gains in full-time work were offset by losses in part-time. Employment gains in 2014 amounted to 186,000 jobs, with increases in the second half of the year accounting for most of the growth.

Provincially, unemployment declined in Prince Edward Island and was little changed in the other provinces.

There were fewer people working in accommodation and food services as well as 'other services' in December. At the same time, employment increased in agriculture, public administration and natural resources. The number of self-employed people, as well as private and public sector employees was virtually unchanged in December.

Historical and forecast Canadian unemployment rates were:



Year	Unemployment Rate (%)
2006	6.3
2007	6.1
2008	6.2
2009	8.3
2010	8.0
2011	7.4
2012	7.3
2013	7.1
2014	6.9
2015*	6.4
2016*	6.3

\*Estimated  
Source: Statistics Canada and RBC Economics Research forecasts

### United States

In this analysis, we examine the general economic climate that existed in the U.S. at the end of the fourth quarter of 2014. This summary provides an overview of some selected economic factors that prevailed at that time as well as a discussion of the factors that are crucial over an extended time period.

### Gross Domestic Product

The Bureau of Economic Analysis reported that the nation's economy—as indicated by GDP—grew at an annual rate of 2.6% in the fourth quarter of 2014. This was below forecasts, as a survey conducted by Bloomberg found that the median forecast of economists was a 3.0% rate. This was also a deceleration from the third quarter, when GDP grew at a 5.0% rate—the fastest quarterly pace in 11 years. GDP is the total market value of goods and services produced in the U.S. economy and is generally considered the most comprehensive measure of economic growth. For all of 2014, the economy grew 2.4% from the year before, the biggest advance since 2010, following a 2.2% expansion in 2013.

Consumer spending, private inventory investment, exports, business investment, state and local government spending, and residential fixed investment all made positive contributions to the fourth-quarter GDP rate. Federal government spending made a negative contribution to GDP, while imports, which are a subtraction in the calculation of GDP, increased.

### Consumer Prices and Inflation Rates

According to the Bureau of Economic Analysis, the price index for gross domestic purchases decreased 0.3% in the fourth quarter of 2014, compared with an increase of 1.4% in the

previous quarter. The price index for gross domestic purchases measures prices paid by U.S. residents. Excluding food and energy prices, the price index for gross domestic purchases rose 0.7% in the fourth quarter, compared with an increase of 1.6% in the previous quarter.

The U.S. Department of Labor reported that the Consumer Price Index fell 0.4% in December, on a seasonally adjusted basis, its largest decline since December 2008. Over the last 12 months, CPI has risen 0.8%. CPI is a measure of a basket of products and services—including housing, electricity, food, and transportation—and is used as a measure of inflation. CPI is comprised of three main indexes: the food index, the energy index, and the all items less food and energy index (also known as “Core CPI”).

Core CPI, a measure of inflation that excludes volatile food and energy costs, was unchanged in December but up 1.6% over the past 12 months. The indexes for shelter, medical care, tobacco, and personal care all rose. Offsetting these increases were declines in the indexes for apparel, airline fares, used cars and trucks, alcoholic beverages, and household furnishings and operations.

The U.S. Department of Labor reported that the Producer Price Index (“PPI”) fell 0.3% in December, on a seasonally adjusted basis. December was PPI’s steepest decline since October 2011. Over the last 12 months, PPI has risen 1.1%. PPI is a gauge of inflation in the manufacturing process that can be a precursor to inflation in consumer prices. PPI for final demand is comprised of two main indexes: final demand services and final demand goods.

In December, the 0.3% decline in PPI was the result of a decrease in the index for final demand goods, which fell 1.2%. In contrast, prices for final demand services moved up 0.2%.

## Interest Rates

The Federal Open Market Committee (“FOMC”) met twice during the fourth quarter of 2014, issuing a statement from each meeting. At both meetings, the FOMC reaffirmed its desire to keep its target for the federal funds rate near zero. The FOMC’s goal with these decisions is to support its continued progress toward maximum employment and price stability. The FOMC noted that it will remain patient in deciding on whether to raise interest rates but will assess all available information in making that determination going forward. The federal funds rate is the interest rate at which a commercial bank lends immediately available funds in balances at the Federal Reserve to another commercial bank. The FOMC establishes a target rate and expands or contracts the money supply with the aim that the federal funds rate, a market rate, will approximate the target rate.

The FOMC found that economic activity was expanding at a moderate pace. It found that labor market conditions had improved, as job gains remained solid and the unemployment rate declined. Additionally, a range of labor market indicators suggested that underutilization of labor resources continued to diminish. The FOMC stated that the housing market recovery remained slow, but household spending and business spending rose. Inflation remained below the FOMC’s longer-run objective, due in part to declining energy prices. The FOMC also determined that the time had come to end its asset purchase program since there had been a substantial improvement in the outlook for the labor market since the inception of the

program. Further, the FOMC continued to see sufficient underlying strength in the broader economy.

During the fourth quarter of 2014, the Board of Governors of the Federal Reserve left the discount rate unchanged, at 0.75%. The discount rate is the interest rate a commercial bank is charged to borrow funds, typically for a short period, directly from a Federal Reserve Bank. The board of directors of each Reserve Bank establishes the discount rate every 14 days, subject to the approval of the Board of Governors.

### Unemployment

The U.S. Department of Labor reported that job creation continued in December, with 252,000 new jobs being created. This came after 261,000 and 353,000 new jobs were created in October and November, respectively. Employment gains have now exceeded 200,000 jobs a month for 11 straight months, the longest stretch since the 19 months that ended in March 1995. Job growth averaged 246,000 per month in 2014, compared with an average monthly gain of 194,000 in 2013. Total employment rose by 2.95 million in 2014, the most in any calendar year since 1999.

The unemployment rate (also known as the U3 unemployment rate) fell 0.2 percentage point to a six-and-a-half-year low of 5.6% in December. The annual average unemployment rate fell 1.2 percentage points between 2013 and 2014, the largest decline since 1984. The number of unemployed persons declined by 383,000 in December to 8.7 million. In 2014, the number of unemployed persons declined by approximately 1.7 million. The U3 unemployment rate is the official unemployment rate per the International Labour Organization definition and occurs when people who have actively looked for work within the past four weeks are still without jobs.

The labor-force participation rate edged down 0.2 percentage point in December to 62.7%. The labor-force participation rate has remained within a narrow range of 62.7% to 62.9% since April. The employment-population ratio—the share of the working-age population with a job—was unchanged in December for the third consecutive month at 59.2%. However, the employment-population ratio rose by 0.6 percentage point in 2014.

The number of unemployed persons who have been out of work for 27 weeks or more was essentially unchanged in December at 2.8 million, or 31.7% of the total unemployed. Over the past 12 months, the number of long-term unemployed has declined by 1.1 million. The average unemployment duration decreased slightly in December to 32.8 weeks from 33.0 weeks in November.

### Economic Outlook

Consensus Economics Inc., publisher of Consensus Forecasts—USA, reports that the consensus of U.S. forecasters is that real GDP will increase at a seasonally adjusted annual rate of 2.8% in both the first and second quarters of 2015. Every month, Consensus Economics surveys a panel of 30 prominent U.S. economic and financial forecasters for their predictions on a range of variables, including future growth, inflation, current account and budget balances, and interest rates. The forecasters expect GDP to grow 3.0% in 2015, 3.0% in 2016, and 2.8% in 2017.

They forecast personal consumption will increase at a rate of 3.0% in both the first and second quarters of 2015. They expect personal consumption to increase 2.8% in both 2015 and 2016.

These forecasters believe unemployment will average 5.7% in the first quarter of 2015 and 5.6% in the second quarter. They believe unemployment will average 5.5% in 2015.

They also believe consumer prices will rise at a rate of 0.9% in the first quarter of 2015 and 1.6% in the second quarter. They expect consumer prices to increase 1.3% in 2015 and 2.1% in 2016. They expect producer prices to increase at a rate of 0.7% in the first quarter of 2015 and 1.1% in the second quarter. The forecasters anticipate producer prices will rise 0.9% in 2015.

The most recent release of The Livingston Survey (the Survey) predicts fairly steady output growth through the end of 2015. The Survey, conducted by the Federal Reserve Bank of Philadelphia, is the oldest continuous survey of economists' expectations. It summarizes the forecasts of economists from industry, government, banking, and academia. The participants project real GDP to grow at an annual rate of 2.9% in the first half of 2015 and 2.7% in the second half of 2015. They believe GDP will grow 2.5% annually over the next 10 years. The Survey forecasted the unemployment rate to be 5.6% in June 2015, before declining to 5.4% in December 2015.

The forecasters in the Survey expect CPI inflation to be 1.4% in 2015 and 2.1% in 2016. The Survey expects CPI to average 2.3% over the next 10 years. The Survey expects PPI inflation to be 1.1% in 2015 and 1.5% in 2016.

## THE ONTARIO PAPERBOARD INDUSTRY

### *Forest Products in Ontario*

According to data provided by the Ontario Forest Industries Association, Ontario's forests cover approximately 800,000 km<sup>2</sup>; comprising 17% of Canada's forests.

The province has four distinct forest regions; the boreal forest in the north and, at its uppermost reaches, the boreal-barrens, and further south the deciduous and Great Lakes/St. Lawrence forest regions. Of these, the boreal forest is by far the largest, covering 550,000 km<sup>2</sup> (close to 50% of the province) and accounting for 76% of Ontario woodlands. Characterized by needle bearing coniferous trees such as spruce and jack pine, and leaf bearing deciduous trees such as poplar and birch, the boreal forest is the primary source of raw material for the forest products industry.



89% of Ontario's forests are publicly owned (88% by the Province, 1% federally), with the 11% balance being privately held.

Ontario's forestry industry has long been a key component of the province's economy, and according to most recently available data from Natural Resources Canada, generates annual revenues of approximately \$10.58 billion, divided between forestry and logging (8.9% of total revenues), paperboard and paper manufacturing (62.1%), and wood products manufacturing (28.9%). Industry participants range from local sawmills and small scale logging operators with a few employees, to integrated multi-national companies with thousands of employees.

### *Paperboard Industry Overview*

Paperboard is a general term descriptive of a sheet of fibrous material made from either virgin wood pulp, recycled paper stock, or a combination of these fibre sources. Paperboard differs from paper in that it is heavier, thicker and more rigid. According to the International Organization for Standardization, paperboard is a paper with a basis weight above 224 g/m<sup>2</sup>, but there are some exceptions. Paperboard can be single or multi-ply, is easily cut and formed, lightweight, and relatively strong. The most extensive use of paperboard is to make shipping containers, cartons and packaging.

Recall that the paperboard industry is defined in this report to include establishments primarily engaged in manufacturing paperboard, establishments that manufacture paperboard in combination with pulp manufacture or paperboard converting facilities, and those primarily engaged in manufacturing paperboard containers such as corrugated and solid fibre boxes from purchased paperboard.

Paperboard comes in several different grades with unique characteristics that make each grade particularly suited to different packaging requirements.

Solid Bleached Sulfate ("SBS") is a premium paperboard grade produced from material containing at least 80% virgin bleached wood pulp. Most bleached paperboard is coated with a thin layer of kaolin clay to improve its printing surface and may also be coated with polyethylene resin for wet strength in food packaging. SBS is typically used in applications where the consumer is likely to see the box,



including medical packaging, milk and juice gable top cartons, aseptic drink boxes, cosmetic and perfume packaging, frozen food packaging and candy boxes.

Coated Unbleached Kraft (“CUK”), also known as solid unbleached sulfate (“SUS”) is a superior strength paperboard grade containing at least 80% virgin, unbleached wood pulp. Since it is unbleached, CUK has a brown appearance all the way through the sheet. As with SBS, most unbleached paperboard is coated with a layer of kaolin clay and may also be coated with polyethylene resin for wet strength. Major uses include packaging for dry and frozen foods, beverage carriers and electronics.

Uncoated Recycled Paperboard (“URP”) is a multi-ply material produced from 100% recovered paper collected from paper manufacturing and converting plants, and post-consumer sources. Some uncoated paperboard is produced with a top ply of white recovered fibre, or is vat dyed for colour. Major uses of URP include the manufacture of tube and core stock, box partitions, folding boxes and shoeboxes.

Coated Recycled Paperboard (“CRP”), just like URP, is a multi-ply material produced from 100% recovered material, but is typically coated with kaolin clay over a top ply of white recovered fibre to improve its printing surface. CRP’s major uses include packaging for soap and laundry detergent, cookies and crackers, facial tissues and napkins, cake mix, cereal boxes and other dried foods.

Paperboard can be further classified into two categories based on its application: containerboard, which includes all the materials used for making corrugated boxes, and boxboard which includes all the materials used for making non-corrugated packaging. Containerboard is further divided into two sub-categories: corrugating medium which is the inner fluted part of the box and gives the box its strength, and linerboard which comprises the inner and outer layers of the box. To illustrate the difference between containerboard and boxboard, a cereal box is made from boxboard, but the 30 cereal boxes delivered to the retailer were likely delivered in just one stronger corrugated box.

## Paperboard Demand

The demand for paperboard is driven by demand in its various end use markets. The primary end-use markets for corrugated products are shown below:

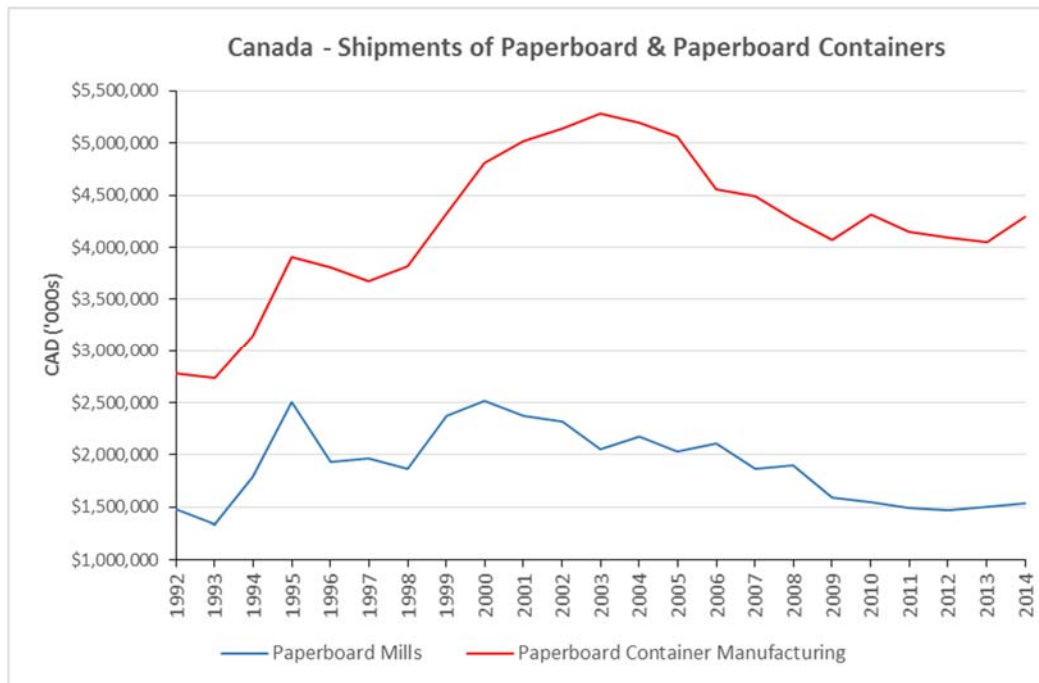
End-Use Market	% of Total
Food, beverages & agricultural products	40%
Paper products	20%
General retail & wholesale trade	18%
Miscellaneous manufacturing	14%
Petroleum, plastic, synthetic and rubber products	6%
Appliances, vehicles and metal products	2%

Source: Fibre Box Association

While the paperboard market is impacted by economic conditions, it tends to be somewhat more resilient than the overall economy given its significant exposure to the non-cyclical food and beverage sectors.

In the Canadian market, we note that shipments of paperboard and paperboard containers have stabilized in recent years after falling from their respective peaks.

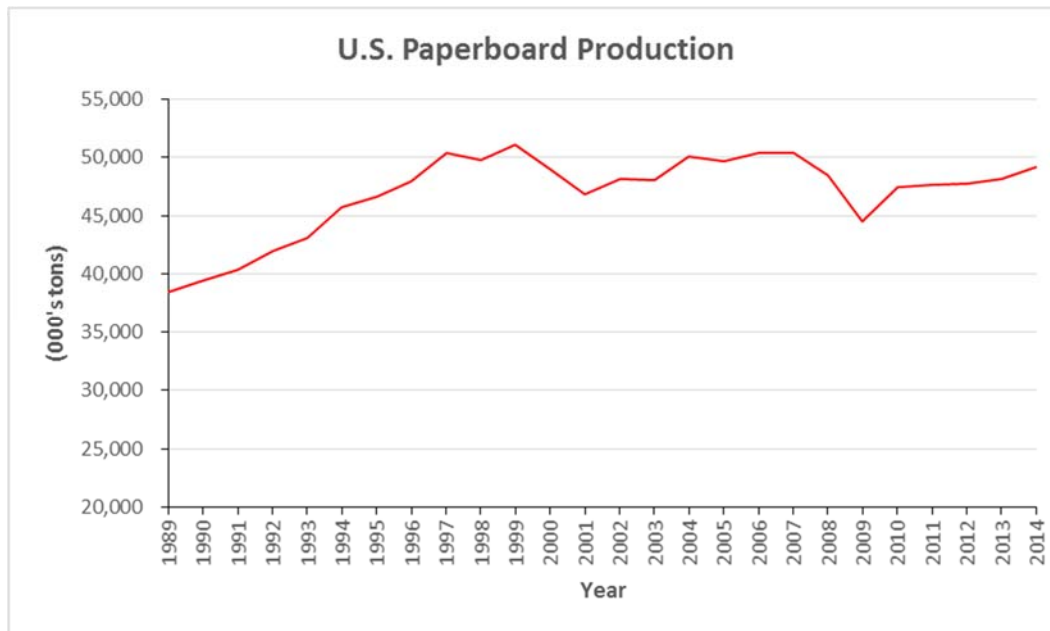
Chart 1



Source: Statistics Canada

A similar trend has been evident in the U.S. where annual paperboard production has recovered from its 2009 recession low, and then grown slowly but steadily since 2010.

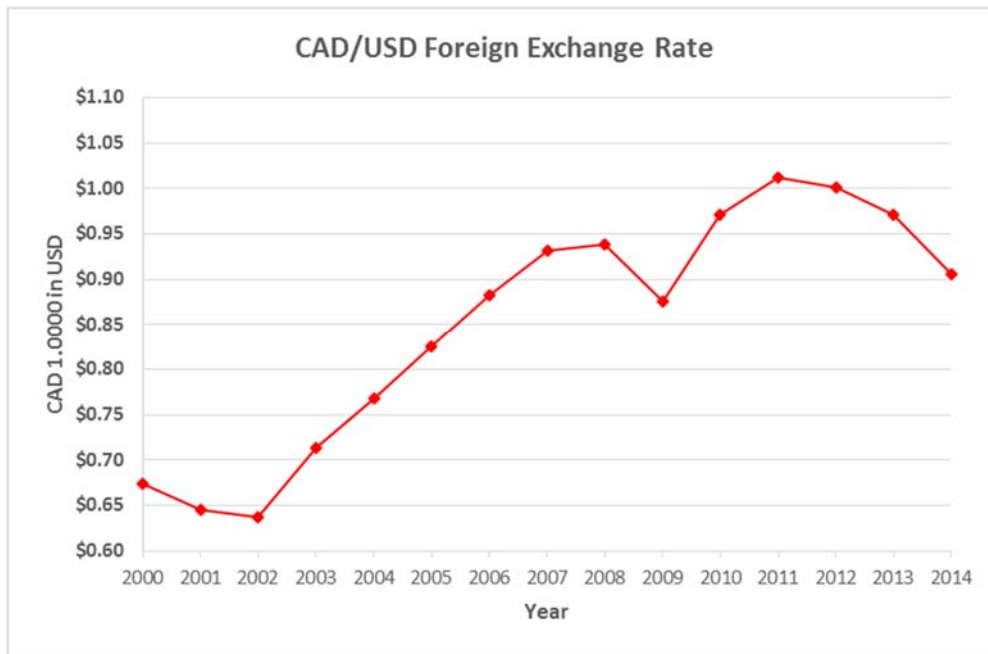
Chart 2



Source: American Forest & Paper Association

In addition to the end-use demand factors previously listed, Ontario paperboard production is also influenced by U.S. export demand and the Canadian dollar (“CAD”) to U.S. dollar (“USD”) foreign exchange rate. According to Statistics Canada, 97.9% to 99.7% of Ontario’s 2014 paperboard exports were destined for the United States, depending on whether we measure such exports by the output of paperboard mills or paperboard container manufacturers. With export revenues denominated in U.S. dollars, and labour and certain other input costs paid in Canadian dollars, the profitability of exporting Ontario paperboard mills and converters has been eroded over the years by an appreciating domestic currency. From the following chart, we can see that the Canadian dollar has appreciated in value from approximately USD 0.64 in 2002 to a 2014 year-to-date average of USD 0.9103. The exchange rate has eased somewhat in recent years, down from its 2011 high (average annual rate) of USD 1.0114. At the Effective Date, the Canadian dollar exchange rate stood at USD 0.8620.

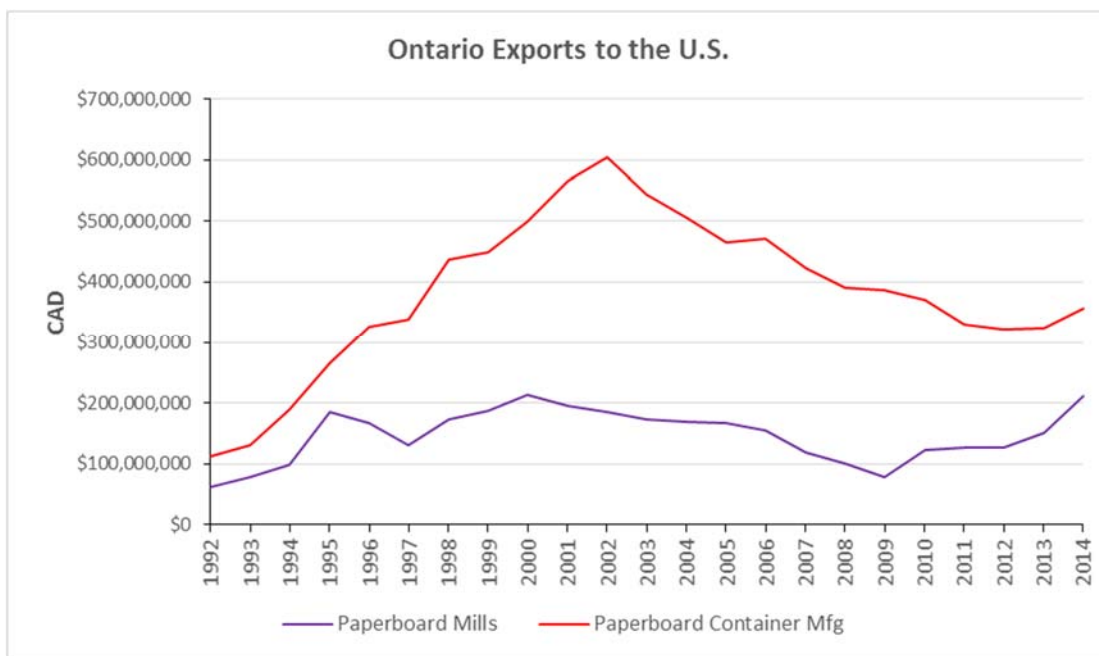
Chart 3



Source: Board of Governors of the Federal Reserve System

As illustrated below, the U.S. exports of Ontario’s paperboard container manufacturers have declined significantly from the 2002 peak, while those of Ontario’s paperboard mills have fared much better.

Chart 4



Source: Industry Canada

The paperboard industry is highly competitive, and market participants include integrated and non-integrated national and regional companies operating in North America that manufacture various grades of paperboard, and to a limited extent, manufacturers outside of North America. Competitors also include large and small packaging products companies that manufacture paperboard containers from purchased paperboard. The primary competitive factors in the paperboard industry are price, design, product innovation, quality and service, with varying emphasis on these factors depending on the product line and customer preferences. Paperboard products compete with plastic packaging and packaging made from other materials.

The paperboard industry has undergone, and continues to undergo significant consolidation. Larger corporate customers with an expanded geographic presence have tended to seek suppliers who can, because of their broad geographic presence, efficiently and economically supply all or a range of their customers' packaging needs. In addition, purchasers of paperboard and packaging products generally, continue to demand higher quality products meeting stricter quality control requirements. Trends toward the greater utilization of recovered materials and the manufacture of lighter grade products have also been evident.

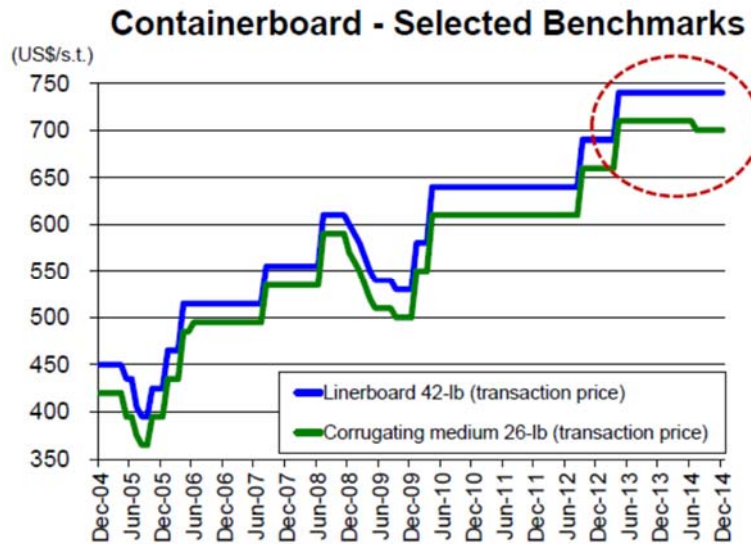
### *Existence of Economic Obsolescence*

The existence of EO in an industry may be indicated by one or more of the following factors:

- reduced demand for the industry's products;
- overcapacity in the industry;
- dislocation of raw material supplies;
- increasing cost of raw materials, labour, utilities, or transportation, while the selling price of the product remains fixed or increases at a much lower rate;
- government regulations that require capital expenditures to be made with little or no return on the new investment; and
- environmental considerations that require capital expenditures to be made with little or no return on the new investment.

A reduced demand for Ontario's paperboard and paperboard products from the U.S. was previously noted (see Chart 4). Prices, however, as represented by linerboard and corrugating medium prices, had reached 10 year highs at the Effective Date.

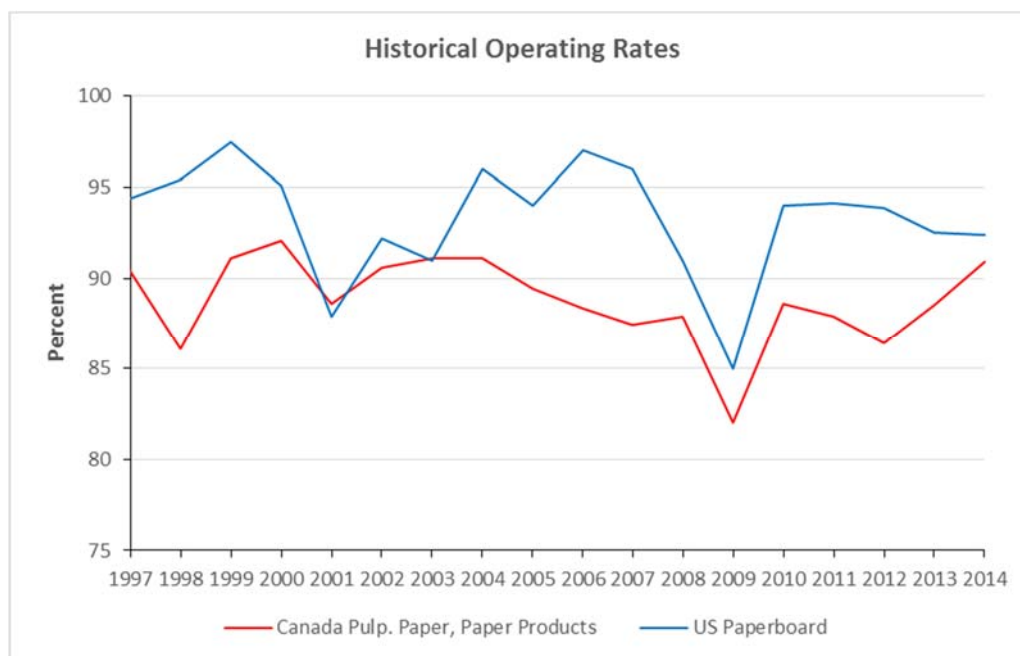
Chart 5



Source: Cascades, Inc.

Capacity utilization has also rebounded sharply since the Great Recession. Please note that Canadian utilization data is only available at the pulp, paper and paper products level (NAICS Code 322), whereas the U.S. data specifically relates to paperboard manufacturing.

Chart 6



Source: Statistics Canada and American Forest & Paper Association

At the Effective Date, The Freedonia Group, Inc. (“Freedonia”) was forecasting a continuation of the slow but steady growth of the U.S. paperboard market, at a compound annual growth rate of 0.4% to 2017, in volume terms. U.S. corrugated and boxboard container demand was forecast by Freedonia to rise 2.6% per year to USD 39.4 billion in 2018. The food and beverage market was expected to remain dominant, based in part on more value-added boxes such as display ready and moisture-resistant types.

In summary, available evidence supports the existence of a relatively low rate of EO in the Ontario paperboard industry, supported by:

- historically high prices for containerboard and linerboard;
- higher capacity utilization rates in the paperboard industry generally;
- higher paperboard and packaging industry profit margins in recent years (see Exhibits C and D); and
- forecast continued growth in the important U.S. market to 2018.

The existence of some level of EO is supported by the fact that Ontario’s exports of paperboard containers to the U.S. remain significantly below peak levels, and that Ontario’s wood fibre costs have historically been higher than the North American average (see Fibre Cost Analysis in a subsequent section of this report).

## **QUANTIFICATION OF ECONOMIC OBSOLESCENCE**

### *Utilization Analysis*

One method used to quantify EO is to review the subject asset’s utilization. If the asset is being utilized at less than 100% or whatever is the industry norm, then EO may exist because demand in the industry is substantially less than available supply. Mathematically, this is based on the relationship whereby EO equals actual utilized capacity (demand) divided by maximum capacity (supply) with the result taken to an exponent (scale factor), subtracted from 1. The scale factor is a relationship of cost to capacity, which reflects the concept that as capacity increases, the cost of construction increases at a different, typically slower, rate. Typically, when a specific scale factor is not known, a value of 0.68 is used for manufacturing facilities based on data published in engineering and construction texts.

$$EO = 1 - (\text{Demand/Capacity})^{0.68}$$

We researched industry sources and were able to obtain annual Canadian pulp, paper and paper products manufacturing (aggregated) utilization rates to the Effective Date. Historical U.S. paperboard industry utilization rates were also available. Additionally, we investigated other data sources including

operating rates for North American paperboard facilities contained in the most recent annual reports of publicly traded fibre-based packaging companies.

We selected a range of Demand/Capacity ratios for use in our valuation, based on the reported 2014 U.S. paperboard industry ratio, and the average ratio observed for Canadian companies operating in NAICS code 322. The U.S. ratio was incorporated to reflect the integrated nature of the North American market and considering its pure focus on the paperboard industry, with the Canadian data also incorporated to reflect the potential impact on utilization of CAD/USD foreign currency exposure.

Based on Utilization Analysis, as of the Effective Date, the EO present in the Industry was estimated to be in a range of 5.2% to 6.3%. See Exhibit B for additional detail.

High utilization rates by themselves, however, are not necessarily indicative of low EO when it comes to an analysis of pulp and paper mills. The pulp and paper industry generally, is highly capital intensive and characterized by significant fixed costs. A large paper machine, for example, can cost between USD 300 million and USD 500 million to construct, and building a large integrated pulp and paper facility can require an investment of more than USD 1 billion. This significant fixed cost base encourages producers to run their facilities at high operating rates to reduce their capital cost per ton and generate cash. Because building a mill is an extremely capital intensive proposition, operators make every effort to keep their mills running continuously, with sufficient downtime to perform scheduled maintenance, make repairs, and address any pricing and inventory situations. Consequently, utilization analysis should be used in conjunction with profitability-based and other methodologies to reliably estimate Industry EO.

### *Gross Margin Analysis*

The study of company or industry returns by comparing gross profit margins over time can also provide a useful measure of EO. Simply put, gross margin is a company's revenues less its cost of goods sold, where cost of goods sold is defined to include the direct costs attributable to the production of the goods sold by a company. This amount includes the cost of the materials used in creating a product, along with the direct labour costs used in its production, but excludes indirect expenses such as distribution and sales force costs. If gross margins have been declining or are currently lower than in the past, EO may be present even if capacity utilization is high. EO can be measured using the formula:

$$EO = \frac{\text{Benchmark GM \%} - \text{Current GM \%}}{\text{Benchmark GM \%}}$$

Our gross margin analysis is presented in Exhibit C.

In the gross margin analysis, a review was made of the relationship of the gross margin percentages realized by a universe of selected guideline companies in the 12 months to December 31, 2014, versus their returns during a period of time when profitability in the paperboard industry was



considered to be normal. 2010 to 2014 represents the most recent period over which industry gross profit margins were considered to be normal.

In selecting the guideline companies, we used the following sources:

- OneSource database
- Standard and Poor's Capital IQ database

We searched the Onesource database for companies operating in the following Standard Industrial Classification ("SIC") codes:

- 322211 – corrugated and solid fibre box manufacturing
- 322212 – folding paperboard box manufacturing
- 322219 – other paperboard container manufacturing
- 32213 – paperboard mills

We also searched using the keyword "paperboard". We then reviewed the identified companies for a focus on, or significant exposure to the paperboard industry. Of the companies reviewed, 8 were selected as being most suitable for use in our analysis including:

- Cascades, Inc. (CAS - TSX)
- Graphic Packaging Holding Company (GPK - NYSE)
- International Paper Company (IP - NYSE)
- Kapstone Paper and Packaging Corporation (KS – NYSE)
- MeadWestvaco Corporation (MWV – NYSE)
- Packaging Corporation of America (PKG – NYSE)
- Rock-Tenn Company (RKT – NYSE)
- Sononco Products Company (SON - NYSE)

EO for each of the guideline companies was calculated using the following formula:

$$EO = \frac{2010 \text{ to } 2014 \text{ Avg. GM } \% - \text{Current GM } \%}{2010 \text{ to } 2014 \text{ Avg. GM } \%}$$

Industry EO, calculated using the mean EO of the selected guideline companies, was estimated to be 0.6%.

### *Return-on-Capital Analysis*

An additional approach to quantifying EO is a return-on-capital analysis (“ROCA”). In such an analysis, the relationship of earnings is compared to the magnitude of investment used to generate those earnings.

In the ROCA, a review was made of the relationship of the percent earned on total capital by each of our 8 selected guideline companies in the 12 months to December 31, 2014, versus their returns during a period of time when profitability in the paperboard industry was considered to be normal. Again, we selected 2010 to 2014 for use in our analysis.

*Percent earned on total capital* is defined as “a company’s return on its stockholders’ equity and long-term debt obligations.” The summation of long-term debt and stockholders’ equity represents the total invested capital of a business enterprise. When the economics of the industry are good, the return on capital will be high; when poor, low. Hence, a return on capital analysis can be a meaningful indicator of economic obsolescence.

Recall that EO can be determined for each of the guideline companies using the following formula:

$$EO = \frac{2010 \text{ to } 2014 \text{ Avg. ROC \%} - \text{Current ROC \%}}{2010 \text{ to } 2014 \text{ Avg. ROC \%}}$$

Using the mean and median of the guideline companies, EO based on a ROCA was estimated to be nil. Please see Exhibit D for calculations.

### *Price-to-Book Ratio Analysis*

Another method for estimating the EO present in a given asset or industry, is to analyze investors’ perception of the investment in that industry using common stock prices. The ratio of price paid for common stock relative to its book value may be indicative of the investors’ perception of the obsolescence present in the investment. Book value of the stock relates to original capital contributed to the firm in exchange for the stock, plus retained earnings that have accumulated since the initial investment.

From a legal perspective, stockholders own the firm in which they have invested. From an investor’s viewpoint, stock ownership is considered to represent a net ownership position in the firm’s assets. At any point in time, if the total value of all assets is considered and a deduction is made for all liabilities, the net amount is representative of the value of the aggregate value of the common stock (as per the balance sheet identity Assets - Liabilities = Shareholder’s Equity). Thus, an investor purchasing shares of common stock is making a decision on the value of the total assets.

Book value of common stocks of publically held companies is calculated with reasonable consistency for most publicly traded companies due to accounting regulations. The regulations involve not only

the general methodology used in the calculations, but also regulate the type of data available to investors. Due to the consistency of reporting, the book values can be useful as a benchmark for certain types of measurements.

The selection of our guideline companies has been previously described. For each of the guideline companies we obtained Effective Date; i) stock price data, ii) number of shares issued and outstanding, and iii) book value of equity from the Capital IQ database. From this information we were able to calculate Effective Date price-to-book (“PTB”) ratios for each of the guideline companies. For baseline comparison purposes, a PTB ratio was available from Bloomberg for the S&P 500 Equal Weight Industrials Index. A comparison of equity PTB value ratios for general industrial stocks versus the Industry was possible, using this data.

The results of our PTB analysis are shown in Exhibit E, with EO estimated using the formula:

$$EO = \frac{\text{S\&P 500 Equal Weight Industrials} - \text{Paperboard Industry}}{\text{S\&P 500 Equal Weight Industrials}}$$

$$EO = (3.62 - 2.95) / 2.95 = 18.5\%$$

Economic obsolescence was calculated using the median PTB ratio of the guideline companies, in light of the significant variation in individual guideline company ratios.

This relationship is indicative of investors’ relative valuation of paperboard industry assets when compared with general industrial stocks. Owners of general industrial stocks appear willing to pay about 18.5% more for such stocks than they would pay for stock in the paperboard industry, based on the PTB value ratio.

PTB ratio analysis is useful primarily as a broad indication of the existence of EO in a given industry, rather than as a specific estimate of its quantum. We note that PTB ratios can be impacted by much more than investors’ perceptions of EO, including a company’s capital structure, the extent of analyst coverage, stock trading liquidity, dividend policy, the existence of stock repurchasing programs etc. Additionally, unavoidable differences exist in the size, growth, profitability and risk of the guideline companies versus Ontario paperboard facilities.

### *Wood Fibre Cost Analysis*

Wood cost is a significant determinant of the competitiveness of pulp and paper mills. According to Wood Resources International, this cost typically varies between 40% and 65% of total cash costs depending on product grade. Consequently, an analysis of the average fibre cost for Ontario mills versus the average fibre cost for competing North American regions can be used to estimate Industry EO. This same approach to estimating EO has been employed by the Ontario Assessment Review Board (“ARB”), an independent adjudicative tribunal whose main function is to hear appeals from taxpayers who believe that their properties have been incorrectly assessed or classified.



American Appraisal obtained quarterly wood fibre prices for the period from Q3 2007 through Q4 2014 from the North American Wood Fibre Review (“NAWFR”). Price data was obtained for both softwood and hardwood wood chips and roundwood, with data available for each of the following North American regions:

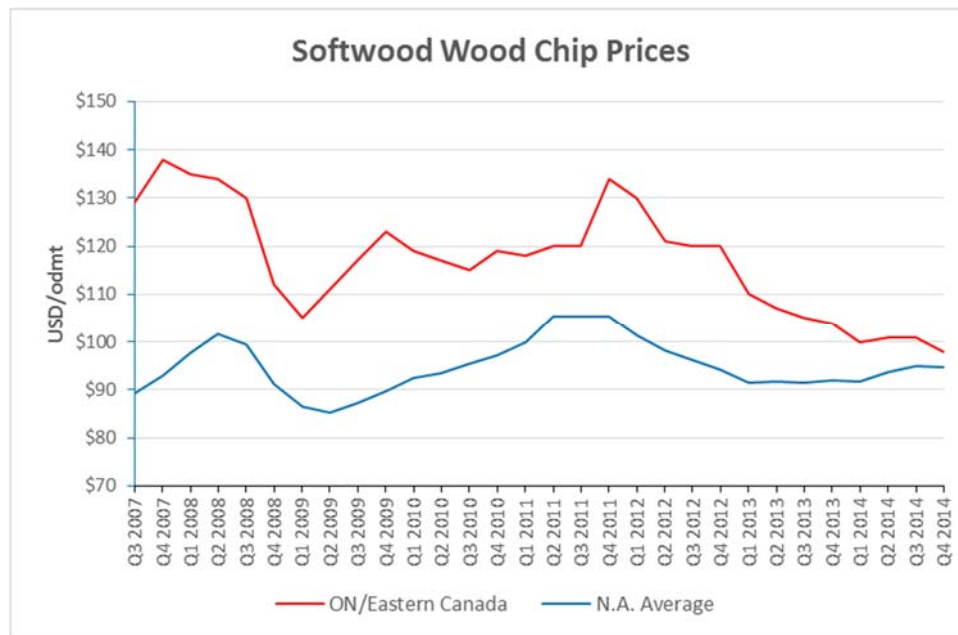
United States	Canada
Northwest	British Columbia
Lake States	Alberta
Northeast	Ontario
Southeast	Quebec
South Central	Maritimes

Please note that beginning in Q4 2011, the data provider aggregates Ontario and Quebec as ‘Eastern Canada’, whereas in prior periods both provinces are separately identified. Consequently, ‘Eastern Canada’ data (used as the best proxy for Ontario fibre costs after Q4 2011), will tend to somewhat overstate actual Ontario costs due to the aggregation with Quebec which has historically been a higher cost region than Ontario.

According to the NAWFR, publication of hardwood wood chip costs for Ontario was suspended in Q1 2012 due to the minimal volumes generated. NAWFR also notes that while softwood roundwood prices are provided for Eastern Canada, this source is a relatively small component of the region’s total wood fibre consumption. Considering the above, and the fact that pulp and paper mills typically resort to higher priced roundwood only in the absence of the availability of lower priced chips, we believe that that most relevant comparison for the purpose of estimating Industry EO is that of Ontario softwood chips versus the North American average (excluding Ontario) for such chips.

We note that the cost of Eastern Canadian softwood chips has become significantly more competitive in recent years due in part to a weakening of the CAD versus the USD, with Eastern Canadian and North American softwood chip costs drawing close to parity at the Effective Date. Prices in the following chart are quoted in USD per oven-dry metric tonnes (“odmt”), and chip prices are for residual chips and do not include chips manufactured from roundwood.

Chart 7



Source: North American Wood Fibre Review

Industry EO was estimated based on the average excess cost of Ontario over North American softwood chips from Q3 2007 to Q4 2014. An average excess cost over a number of years was employed, in order to provide a sufficiently reliable representative sample.

$$EO = (\text{Ontario Average Chip Cost} / \text{North American Average Chip Cost}) - 1$$

$$EO = 23.4\%$$

In other words, Ontario fibre costs as measured by the cost of softwood chips have been, on average, 23.4% more expensive than the North American average over the observation period. This figure is somewhat overstated by the previously mentioned issue of the combination of Ontario with higher-cost Quebec into an Eastern Canada aggregate beginning in Q4 2011.

### ***Correlation and Conclusion for the Ontario Paperboard Industry***

Application of the multiple analyses of EO as described above resulted in the following indicators for the Ontario paperboard industry:



Method	Economic Obsolescence
Utilization Analysis	5.2% to 6.3%
Gross Margin Analysis	0.6%
Return-on-Capital Analysis	0.0%
Price-to-Book Ratio Analysis	18.5%
Wood Fibre Cost Analysis	23.4%

The concluded EO rate for the Industry was 7.5% based on the average rate indicated by utilization, gross margin, return-on-capital and fibre cost analyses. EO estimated using a price-to-book analysis was not believed to be reliably indicative of the Industry’s quantum of EO, and was used more as a broad indicator of the possible existence of Industry EO, and to widen our analysis beyond utilization, profit and cost based methodologies.



CONCLUSION

Based on the information and analysis summarized in this report, it is our view that EO in the Ontario paperboard industry at January 1, 2015 was reasonably estimated as follows:

Industry	Economic Obsolescence at Jan. 1, 2015
Ontario Paperboard	7.5%

We reserve the right, but will be under no obligation, to review all calculations referred to in this report and, if considered necessary by us, to revise our estimates in the light of any new facts, trends or changing conditions existing at any date prior to or at the Effective Date, which become apparent to us subsequent to the date of this report.

The engagement of, and compensation for, American Appraisal and its employees was not contingent on the development or reporting of predetermined values or a direction in value that favors the cause of the client; the amount of the value estimates; the attainment of stipulated results; nor the occurrence of a subsequent event directly related to the intended use of this appraisal.

This report represents American Appraisal’s impartial and unbiased analysis, estimates, and conclusions limited only by the Terms and Conditions which were part of our Letter of Engagement, and the Assumptions and Limiting Conditions which are part of this report.

Neither American Appraisal nor its employees who were assigned to this engagement (including their immediate family members) have any substantial interest, direct or indirect, in MPAC or in any party directly or indirectly controlling or, controlled by or, under direct or indirect common control with MPAC.

We also confirm we are not connected with MPAC or any party directly or indirectly controlling or, controlled by or, under direct or indirect common control of MPAC as an officer, employee, promoter, underwriter, trustee, partner, director or persons performing similar functions.

Respectfully submitted,

*American Appraisal Canada, Inc.*

No third party shall have the right of reliance on this report, and neither receipt nor possession of this report by any third party shall create any express or implied third-party beneficiary rights.

# Exhibit A

## Economic Obsolescence Summary



**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paperboard Industry**  
**Economic Obsolescence Summary**  
**As of January 1, 2015**

**Exhibit A**

<u>Method</u>	<u>Economic Obsolescence</u>
(1) Utilization Analysis	5.2% to 6.3%
(2) Gross Margin Analysis	0.6%
(3) Return-on-Capital Analysis	0.0%
(4) Price-to-Book Ratio Analysis	18.5%
(5) Fibre Cost Analysis	23.4%
Selected Range	0.0% to 23.4%
(6) <b>Selected Obsolescence Rate</b>	<b>7.5%</b>

Notes:

- (1) See Exhibit B.
- (2) See Exhibit C.
- (3) See Exhibit D.
- (4) See Exhibit E.
- (5) Based on a cost comparison of Ontario softwood chips versus the North American average (excluding Ontario) for the period Q3 2007 through Q4 2014. Source is North American Wood Fiber Review.
- (6) Based on the average indicated using utilization, gross margin, return-on-capital and fibre cost analyses.

# Exhibit B

## Utilization Analysis

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paperboard Industry**  
**Utilization Analysis**  
**As of January 1, 2015**

**Exhibit B**

<u>Owner</u>	<u>Mill Location</u>	<u>Products</u>	<u>Total Capacity</u> ( <u>'000 tons</u> )	<u>Total Production</u> ( <u>'000 tons</u> )	<u>Total Production</u> <u>Total Capacity</u>
(1) Cascades, Inc.	Multiple	Containerboard	1,437	1,308	91.0%
(2) Rock-Tenn Co.	Multiple	Linerboard	5,721		
		Corrugating medium	2,215		
		Coated recycled paperboard	646		
		Bleached paperboard	481		
		Specialty recycled paperboard	339		
		Market pulp	452		
			9,854	9,361	95.0%
(3) Packaging Corporation of America	Counce, TN	Kraft linerboard	1,070	1,079	100.8%
	Valdosta, GA	Kraft linerboard	570	573	100.5%
	Tomahawk, WI	Semi-chemical medium	555	555	100.0%
	Filer City, MI	Semi-chemical medium	440	444	100.9%
	Wallula, WA	White paper, medium	145	142	97.9%
			2,780	2,793	100.5%
(3) Clearwater Paper Corporation	Cypress Bend, AR	Bleached paperboard mill	347	327	94.2%
	Lewiston, ID	Bleached paperboard mill	465	464	99.8%
			812	791	97.4%
(4) 2014 U.S. Paperboard Industry Operating Rate					92.4%
(5) 2014 Average Canadian Capacity Utilization Rate (NAICS 322)					90.9%
(6) Selected Demand/Capacity				<u>U.S. Paperboard</u> <u>Industry</u> 92.4%	<u>Cdn. Utilization</u> <u>NAICS 322</u> 90.9%
<b>EO = 1 - (Demand/Capacity)<sup>0.68</sup></b>				5.2%	to 6.3%

Notes:

- (1) Capacity utilization rate is defined by Cascades as manufacturing internal and external shipments / practical capacity. Excludes discontinued operations and Specialty Products Group manufacturing activities.
- (2) 95% represents a 3 year average utilization rate quoted in form 10-K of Rock-Tenn for the period ended September 30, 2014.
- (3) Source is form 10-K for the fiscal year ended December 31, 2014.
- (4) Source: American Forest & Paper Association. Based on most recently available data to July 2014.
- (5) Source is Statistics Canada. NAICS code 322 comprises establishments primarily engaged in the manufacture of pulp, paper and paper products.
- (6) Selected demand/capacity is presented in a range using the 2014 average for Canadian NAICS code 322, and the year-to-date average for the U.S. paperboard industry.

# Exhibit C

## Gross Margin Analysis

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paperboard Industry**  
**Gross Margin Analysis (1)**  
**As of January 1, 2015**

**Exhibit C**

<b>Guideline Company</b>	<b>Current GM %</b>	<b>High GM %</b>	<b>Benchmark Avg. 2010 - 2014 GM % (2)</b>	<b><u>High % - Current %</u> High %</b>	<b><u>Benchmark% - Current %</u> Benchmark %</b>
Cascades, Inc.	13.9%	27.8%	13.6%	50.0%	0.0%
Graphic Packaging Holding Company	18.6%	21.9%	16.2%	15.4%	0.0%
International Paper Co.	31.2%	31.2%	29.1%	0.0%	0.0%
KapStone Paper and Packaging Corp.	32.9%	43.9%	30.4%	25.1%	0.0%
MeadWestvaco Corp.	21.2%	30.8%	20.0%	31.1%	0.0%
Packaging Corporation of America	21.0%	26.2%	22.0%	19.8%	4.6%
Rock-Tenn Company	25.3%	28.2%	20.9%	10.3%	0.0%
Sonoco Products Company	18.4%	23.3%	17.9%	21.1%	0.0%
Mean	22.8%	29.2%	21.3%	21.6%	0.6%
Median	21.1%	28.0%	20.5%	20.5%	0.0%

**(3) Economic Obsolescence**

**0.6%**

Notes:

- (1) Source: Standard & Poor's Capital IQ database.
- (2) 2010 to 2014 represents the most recent period over which industry returns were considered to be normal.
- (3) Economic obsolescence was based on the observed mean of the  $\{(Benchmark\% - Current\%) \div Benchmark\% \}$  calculations for the guideline companies. The  $\{(High\% - Current\%) \div High\% \}$  calculation is shown only for illustration purposes as a maximum E.O. level using this methodology. Current period represents latest 12 months results to December 31, 2014.

# Exhibit D

## Return-on-Capital Analysis

**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paperboard Industry**  
**Return-on-Capital Analysis (1)**  
**As of January 1, 2015**

**Exhibit D**

<b>Guideline Company</b>	<b>Current ROC %</b>	<b>High ROC %</b>	<b>Benchmark Avg. 2010 - 2014 ROC % (2)</b>	<b>High % - Current % High %</b>	<b>Benchmark% - Current % Benchmark %</b>
Cascades, Inc.	3.5%	8.0%	2.7%	55.7%	0.0%
Graphic Packaging Holding Company	8.4%	8.4%	6.4%	0.0%	0.0%
International Paper Co.	8.5%	9.9%	7.7%	14.6%	0.0%
KapStone Paper and Packaging Corp.	10.5%	15.2%	9.4%	30.8%	0.0%
MeadWestvaco Corp.	5.6%	10.5%	4.4%	46.8%	0.0%
Packaging Corporation of America	12.1%	13.1%	11.6%	7.3%	0.0%
Rock-Tenn Company	8.4%	12.5%	8.0%	32.5%	0.0%
Sonoco Products Company	9.7%	14.3%	9.5%	32.4%	0.0%
Mean	8.3%	11.5%	7.5%	27.5%	0.0%
Median	8.4%	11.5%	7.8%	31.6%	0.0%

(3) **Economic Obsolescence**

**0.0%**

Notes:

- (1) Source: Standard & Poor's Capital IQ database.
- (2) 2010 to 2014 represents the most recent period over which industry returns were considered to be normal.
- (3) Economic obsolescence was based on the observed mean and median of the  $\{(Benchmark\% - Current\%) \div Benchmark\% \}$  calculations for the guideline companies. The  $\{(High\% - Current\%) \div High\% \}$  calculation is shown only for illustration purposes as a maximum E.O. level using this methodology. Current period represents latest 12 months results to December 31, 2014.

# Exhibit E

## Price-to-Book Ratio Analysis



**Municipal Property Assessment Corporation**  
**Economic Obsolescence Analysis of the Ontario Paperboard Industry**  
**Price-to-Book Ratio Analysis**  
**As of January 1, 2015**

**Exhibit E**

<u>Guideline Company</u>	<u>P/B Ratio</u>
(1) Cascades, Inc.	0.69
(1) Graphic Packaging Holding Company	4.40
(1) International Paper Co.	3.33
(1) KapStone Paper and Packaging Corp.	3.46
(1) MeadWestvaco Corp.	2.12
(1) Packaging Corporation of America	4.89
(1) Rock-Tenn Company	1.95
(1) Sonoco Products Company	2.57
Mean	2.93
Median	2.95
(2) S&P 500 Equal Weight Industrials Index	3.62
(3) EO = (Industrials - Paperboard) / Industrials	<b>18.5%</b>

Notes:

- (1) Stock Price/Book Value ratios are calculated using Effective Date closing prices and the most recently available regulatory filings of the guideline companies.
- (2) Source: Bloomberg.
- (3) Economic obsolescence is calculated using the median Stock Price/Book Value ratio of the guideline companies, in light of the significant variation in individual guideline company ratios.

# Exhibit F

## Assumptions and Limiting Conditions

## **ASSUMPTIONS AND LIMITING CONDITIONS**

This service was performed with the following general assumptions and limiting conditions.

To the best of our knowledge, all data, including historical financial data, if any, relied upon in reaching opinions and conclusions or set forth in this report are true and accurate. Although gathered from sources that we believe are reliable, no guarantee is made nor liability assumed for the truth or accuracy of any data, opinions, or estimates furnished by others that have been used in this analysis.

No responsibility is assumed for matters legal in nature. No investigation has been made of the title to or any liabilities against the property appraised. We have assumed that the owner's claim is valid, the property rights are good and marketable, and there are no encumbrances that cannot be cleared through normal processes, unless otherwise stated in the report.

The value or values presented in this report are based upon the premises outlined herein.

The date of value to which the conclusions and opinions expressed apply is set forth in the report. The value opinion presented therein is based on the status of the economy and on the purchasing power of the currency stated in the report as of the date of value.

This report has been made only for the use or uses stated, and it is neither intended nor valid for any other use.

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