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22 MARCH 2011

## EXPLORATION ORBITE VSPA INC.

*A Game-Changing Alumina Production Company*

ORT/A — TSX: C\$2.76  
INITIATING COVERAGE

RECOMMENDATION: SPECULATIVE BUY  
TARGET PRICE: C\$7.50

STRATEGIC METALS & CLEAN TECH

**Matt Gowing, CFA**

*Analyst, Strategic Metals & Clean Tech*

416.860.8675

[mgowing@mackieresearch.com](mailto:mgowing@mackieresearch.com)

**Raveel Afzaal, Associate**

416.860.7666

[rafzaal@mackieresearch.com](mailto:rafzaal@mackieresearch.com)

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## INVESTMENT HIGHLIGHTS

## EXPLORATION ORBITE VSPA INC.

ORT/A – TSX: C\$2.76

22 MARCH 2010

*A Game-Changing Alumina Production Company*

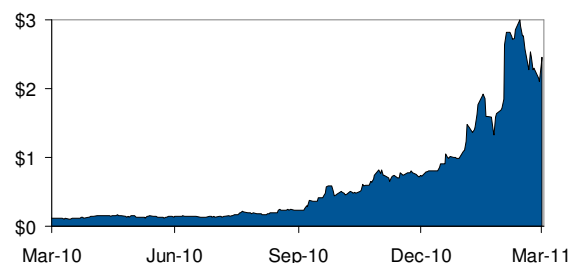
- Exploration Orbite VSPA Inc. is a hybrid resource and processing technology company. The market opportunity of its new patented processing technology is profound as it may allow for low-cost alumina production within a Quebec aluminum manufacturing industry that imports \$3 billion of higher-cost alumina.
- **We believe that Orbite's technology is the only one in the world that allows for extraction of alumina from the argillite such as that found in the Gaspé region.** Orbite presently owns 6,441 hectares (64 sq. km) of land at its Grand Vallee property on the Gaspé Peninsula in Quebec, a world-leading region in aluminum production.
- Incumbent alumina producers have been using the Bayer Process for more than 100 years. Orbite's new process creates less toxic material and produces high-purity alumina. We believe that Orbite's argillite process has a significant cost advantage. Samples from this new process have been tested by Rio Tinto Alcan's alumina processing plant (Aluminerie Alouette Inc.) and the alumina is of excellent quality.
- The company targets to displace the more expensive supply of bauxite-based alumina with its own alumina production which will be derived, extracted, and processed from the claystone (also known as argillite) lands of the Gaspé region of Quebec.
- The company's new pilot plant located in the heart of the Gaspé region, at Cap-Chat, Quebec, recently announced successful production of both metallurgical and ultra-pure alumina. This achievement has validated Orbite's technology of being able to process alumina from claystone.
- Resource reports have been completed by an Independent Engineer quantifying a total of 1 billion tonnes of resource feedstock at a grade of 23.13% Al<sub>2</sub>O<sub>3</sub> on approximately 5% of the land package owned. **This is more than three times the previous resource estimate.**
- The main risks involve commodity price risk, technology risk, commercialization risk, and resource development and mining risks.
- We are initiating research coverage on Exploration Orbite VSPA Inc. with a 1-year target price of \$7.50 and a SPECULATIVE BUY recommendation. Our NAV-based valuation has been extensively discounted, and this target price may be significantly increased upon the company meeting key milestones.

## RECOMMENDATION: SPECULATIVE BUY

## Per Share Data C\$

Price (02/21/11):	\$2.76	Basic Shares O/S:	128 mm	
Target Price (1 yr.):	\$7.50	FD Shares:	171 mm	
Projected Return:	172%	Float (Shares):	89.6 mm	
52 Wk. Range:	\$1.11-\$3.23	Market Cap.:	\$353 mm	
<b>FY Aug 31</b>	<b>2009A</b>	<b>2010E</b>	<b>2011E</b>	<b>2012E</b>
EPS-Basic	(\$0.01)	(\$0.03)	(\$0.11)	\$0.39
CFPS	(\$0.01)	(\$0.03)	(\$0.04)	\$0.47

## ORT'A-TSX



**STRATEGIC METALS & CLEAN-TECH**

# EXPLORATION ORBITE VSPA INC.

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## STRATEGIC METALS &amp; CLEAN-TECH

## EXPLORATION ORBITE VSPA INC.

## EXECUTIVE SUMMARY

**We are initiating coverage on Exploration Orbite VSPA Inc. with a 1-year target price of \$7.50 and a SPECULATIVE BUY recommendation.**

Exploration Orbite VSPA Inc. (Orbite) is a hybrid resource and processing technology company. Orbite has developed a unique process to extract alumina from claystone. This process is expected to offer an improvement on the 19<sup>th</sup> century Bayer Process to extract alumina from bauxite deposits. Orbite has been successful in proving that its process works on a laboratory scale and has secured its innovative technology through Canadian and U.S. patents, with an international Patent Co-op Treaty (PCT) patent pending that expands patent protection. The company, with the financial and technical support of Aluminerie Alouette Inc., has initiated a pilot project that has proven production rates of one tonne per day of alumina. Both smelter grade alumina (SGA) and high-purity alumina have been produced at this production rate, as the plant is configured to produce either of these two alumina types. The pilot project is intended to run until the end of 2011 and demonstrate that the patented process can produce consistent quality of Smelter Grade Alumina (SGA) and high-purity alumina within the operational parameters. **The market opportunity of its patented processing invention is profound as it may allow for low-cost alumina production within a Quebec aluminum industry that imports \$3 billion of higher-cost alumina to feed its refineries.** First commercial production, moreover, will be of ultra-pure alumina and is expected to generate remarkably high net profit margins and cash flow due to the high prices realized in this niche market.

**Because of the soft nature of the claystone, the rock may be extracted with a backhoe; drilling and blasting are not required.** Orbite's process then mechanically crushes the claystone, and acid leaches it at high temperatures (above 100° C) while using high pressure. This process is followed by distillation of the leachate and recovery of over 90% of the acid. Iron and metallurgical aluminum-ion are then extracted from the solution by selectively adjusting the pH levels. A final processing step produces alumina. Orbite can selectively pull out other impurities to recover high-purity (99.999%) alumina. Orbite has close to 95% and 100% recovery rates of the aluminum and iron, respectively.

**Orbite has several important competitive advantages.** These include a lower-cost approach to alumina extraction and processing, geographical advantages, environmental advantages, strong patent protection having been issued three patent families (and awaiting patents on two more families), relationships with major alumina industry players, and political support from the Quebec Government.

**The key near-term milestone in Orbite's commercialization plan is the completion of quality-control tests with important smelting grade partners as well as high-purity alumina customers such as Aluminerie Alouette Inc.** Pending satisfactory results, the company is expected to enter into strategic alliances with these smelting grade partners and possibly certain high-purity customers. Thereafter, we expect that Orbite will make the required investment and construct the capabilities to increase the production rate of the Cap-Chat pilot plant to become a 5 tpd high-purity producer (20% global market share) by the beginning of 2013. Also, investment will be made in

infrastructure to extract the aluminous ore and for construction of a 3,000 tpd smelting grade facility (1% of global market share). All the while, further tests to determine economic alternative uses of the process will be completed to determine extraction ability of rare earths and other rare metals that are believed to exist in Orbite's 6,441 hectares (64 sq. km) of mining claims at its Grand Vallee property.

High-purity alumina is metallurgical alumina oxide that has been further refined to a purity of 99.99% or higher. Based on our discussions with industry participants, we estimate the current annual market size of the global high-purity alumina (HPA) market to be about 7,500 tonnes. High-purity alumina is used in several growth industries which include LED lights, PCs, semiconductors, artificial sapphires and rubies for fiber optic communication systems, coating of missile nose cones, ultra-pure nano-materials, and bio-ceramics for prostheses and implants. The pricing of high-purity alumina varies based on purity level, as well as size of the alumina oxide powder, and can range from US\$75,000/tonne to US\$1.8 million/tonne. The company anticipates that its average realized price will be approximately US\$300,000/tonne. However, in order to be conservative, we use an average selling price of only US\$200,000/tonne in our financial model.

World production of metallurgical alumina in 2010 totalled about 81.7 million tonnes. In 2008, 82 million tonnes of alumina were sold, representing a market size of about US\$33 billion. We expect to see an increase in the demand for aluminum, and in turn alumina. Similarly, we have a bullish view on aluminum and alumina prices.

**What is remarkable about Orbite's business plan is that the company is expected to be able to generate positive earnings in the quarter (Q1/12) when the first high-purity plant begins operations.** In the year following, both earnings (EPS) and cash flow per share (CFPS) are expected to significantly ramp higher. When only including one high-purity plant operating at a 5 tpd production rate and one 3,000 tpd SGA (Smelter Grade Alumina) plant, Orbite should generate an annual run-rate of approximately \$2.00 of EPS and CFPS beginning in 2013. A total of \$420 million in capital investment is assumed to be required to bring the existing pilot plant at Cap-Chat, Quebec to a 5 tpd producer, and to put one 3,000 tpd SGA plant into operation. This assumes \$20 million, \$300 million, and \$100 million, respectively, for the high-purity plant, the SGA plant, and the capex required to construct the argillite mining infrastructure. The company has approximately \$10 million in cash at the present time.

**We arrive at a 1-year target price of \$7.50 per share based on our NAV calculation, which takes the average of P/E and DCF approaches.** We combine target valuations of the high-purity and the metallurgical plant to arrive at this figure. In this base-case valuation, we do not include several additional value-creating levers, including resource value, licensing, and other growth opportunities. However, we do quantify the upside in the valuation section of the report if one were to include these factors into a base case. One should note that a significant upside to our valuation exists if Orbite is able to move its resource from the "indicated" category to the "reserve" category. Our NAV-based valuation has been extensively discounted, and this target price may be significantly increased upon the company meeting key milestones. We use a 15% discount rate in our DCF models for the Smelter Grade Alumina (SGA) and High-Purity Alumina production facilities. In addition, we only assign a 30% probability to the plants achieving commercialization in order to derive a conservative target price.

**We expect 2011 to be an important year for the company in terms of valuation catalysts.** In the near term, we are expecting a switch back to high-purity production at the Cap-Chat plant. Additionally, off-take agreements may be announced. New resource reports, updates on high-value rare metal extraction, and a potential take-out are other catalysts.

**Figure 1: Valuation Catalysts**

<b>Estimated Date</b>	<b>Catalyst</b>
May-11	Additional engineering reports that better describe the grades of by-products (rare earths, scandium and gallium) in the claystone deposit, as well as the process to extract these by-products.
June-11 onwards	Off-take agreements for its products.
Dec-11	Test results from the pilot project to validate the company's claim that it can produce consistent quality of High-Purity and Smelter Grade Alumina within operational parameters.
Dec-11	Bankable Feasibility Study completion date.

*Source: Company, Mackie Research Capital*

## COMPANY OVERVIEW AND BACKGROUND

*Note: All financial figures in this report are in Canadian dollars, unless stated otherwise.*

Exploration Orbite VSPA Inc. (Orbite) is a hybrid resource and processing technology company. Orbite was formed in 1983 as a resource exploration company that explored for diamonds, among other minerals, in the Demaraisville region of Quebec. In 2001, the company graduated to the TSX Venture Exchange from the old Montreal Exchange. On August 29, 2005, Orbite entered into a transaction to purchase the mining rights to the Grand-Vallee alumina claystone deposit on the Gaspé Peninsula, about 32 kilometres northeast of Murdochville. Due to an absence of any known economic process to extract the alumina from claystone, the purchase price of the mining rights amounted to just 500,000 shares, a consideration of \$100,000, and a 3% net profits interest that can be bought out for \$500,000 after five years of production. Weeks following this transaction, Mr. Richard Boudreault joined the board and was made Vice-President of Strategy and Technology. Mr. Boudreault was named President of the company two years later after his team had developed a laboratory-scale alumina extraction process from claystone.

## TECHNOLOGY DESCRIPTION AND OPPORTUNITIES

Orbite has developed a unique process to produce alumina from claystone, a rock that has, until now, resulted in lower quality alumina at a higher expense during previous metallurgical extractive attempts. Orbite has protected its process through awarded Canadian and U.S. patents, with an international Patent Co-op Treaty (PCT) patent pending. The company has significantly de-risked its process through the commissioning of a pilot plant that has proven production rates of one tonne per day of alumina. Both smelter grade alumina (SGA) and high-purity alumina have been produced at this production rate when the plant is configured to produce either of these two alumina types.

## THE RESOURCE OPPORTUNITY

Orbite has also acquired the mining rights to more than 6,441 hectares (64 sq. km) of claystone land in the Gaspé Peninsula of Quebec, across the St. Lawrence River from the heart of Quebec's aluminum refining region. A NI 43-101 compliant resource report has identified a resource of 1 billion tonnes grading 23.13%  $Al_2O_3$ . This resource is said to exist on just 5% (3.5 sq. km) of the surface area of the land footprint.

## THE BUSINESS MODEL

**Orbite intends to penetrate both the high-purity alumina market and the SGA alumina market on a significant scale.** The existing 1 tpd plant at Cap-Chat will become a designated high-purity (HP) producer when metallurgical tests have been completed with partners such as Aluminerie Alouette Inc. (Alouette) and Amalgamated Metal Corporation, PLC, amongst others. By early 2013, Orbite aims to increase the HP plant's capacity to a 5 tpd production rate. Orbite expects to attract new industries within Quebec as technology companies decide to locate in the province's new fibre-optic production facilities, for example, to secure a low-cost source of HP alumina supply.

Another leg of the business plan is for the construction of an initial SGA plant to have a 3,000 tpd operating facility. The first SGA plant is also targeted to reach its maximum capacity by early 2013. By this time, Orbite plans on having quantified adequate resources on its argillite property to be able to support the operation of



approximately ten 3,000 tpd SGA facilities in the Gaspé Peninsula, providing Orbite with the ability to displace all alumina imports into the region. Figure 2 is a snapshot of the core market opportunities.

**Figure 2: Snapshot of the Core Market Opportunities**

Snapshot of the Smelter Grade Alumina (SGA) market opportunity		Snapshot of the High-Purity Alumina market opportunity	
2010 Alumina global production ('000 tonnes)	82,000	2010 High-Purity Alumina global production (tonnes)	7,500
2010 estimated Alumina global market size (US\$ million)	\$33,000	2010 estimated Alumina global market size (US\$ million)	\$2,250
Alumina market growth rate (CAGR %)	7%	Orbite's annual targeted production in Quebec (tonnes)	1,500
		High-Purity Alumina market growth rate (CAGR %)	7%
2010 Quebec's Alumina requirements ('000 tonnes)	7,000		
2010 Alumina production in Quebec ('000 tonnes)	1,500	High-Purity Alumina market prices (US\$ 000/tonne)	\$700-\$1,800
<b>2010 Alumina imports in Quebec ('000 tonnes)</b>	<b>5,500</b>	<b>Orbite's estimate of Average Selling Price (\$ 000/tonne)</b>	<b>\$300</b>
		<b>MRCC estimate of Average Selling Price (\$ 000/tonne)</b>	<b>\$200</b>
Orbite's annual targeted production in Quebec ('000 tonnes)	900	MRCC estimate for Operational Expenses of SGA (\$/tonne)	\$1,000
Estimated Quebec market penetration	13%		
MRCC estimate for Average Selling Price of SGA (\$/tonne)	\$400	Capex (\$ million)	\$20
MRCC estimate for Operational Expenses of SGA (\$/tonne)	\$166	MRCC NAV estimate @ 15% discount rate (\$ million)	\$1,014
		Value per share (\$)	\$5.22
Capex (\$ million)	\$300		
MRCC NAV estimate @ 15% discount rate (\$ million)	\$501		
Value per share (\$)	\$2.58		

Source: Company, Mackie Research Capital

## EXPORT, LICENSING, AND WASTE MARKETING OPPORTUNITIES

Due to high growth rates expected from both the HP and SGA industries over the next few years, significant export opportunities may be available to Orbite. World-leading aluminum producing companies have recently indicated plans for large-scale capacity increases, in the Quebec market as well as in international markets such as Iceland. According to the new NI 43-101 compliant resource estimate, Orbite has enough aluminous ore such that additional plants may be constructed to satisfy export opportunities in these international markets.

Due to the game-changing nature of Orbite's technology and the availability of similar claystone alumina resources in China and Russia, attractive licensing opportunities are also believed to exist.

Furthermore, commercial markets have been identified for Orbite's waste product, including metal-trapping absorbents for sewage treatment, and primary material for clay tile and brick manufacture.

## OTHER HIGH-VALUE METAL EXTRACTION POTENTIAL

Our research indicates that the company should be able to produce and sell 7,200 kg and 546 kg of high-purity gallium and scandium oxide per annum, respectively, beginning in 2013. We assume average selling prices of US\$600/kg for its gallium products and US\$1,620/kg for its scandium oxide products. This compares with current smelting grade alumina prices of approximately US\$0.40/kg, and high-purity prices averaging approximately US\$300/kg.

## MAJOR ACCOMPLISHMENTS: PARTNERSHIPS SECURED & TECHNOLOGY VALIDATION

Orbite has achieved many accomplishments that continue to place the company on track for executing its business plan. These accomplishments are bulleted below:

- Laboratory-scale pilot lines demonstrated that the alumina production process works, and patents have been secured in Canada, the U.S., and internationally.
- A 1 tpd pilot plant at Cap-Chat, Quebec has been commissioned, and its production rate has been proven to exceed 1 tpd for high-purity or smelter grade alumina (SGA) processing.

- The concept has been validated by various multi-national aluminum corporations, and by professional engineering firms.
- The property size has been increased from an initial size of 600 hectares to a current size of 6,441 hectares (64 sq. km).

**The company recently received an updated NI 43-101 compliant resource estimate that substantially increases the previous resource range at the Grand Vallee property from 75-300 million tonnes to 1 billion tonnes.** We calculate that the updated resource value should provide sufficient supply for seven full-scale smelting grade alumina producing plants. The grade of the deposit has declined only slightly from 24% to 23%  $\text{Al}_2\text{O}_3$ , but is still said to be highly homogenous according to Geologist Jean-Guy Levaque, qualified person under NI 43-101 and author of the deposit's technical report. This compares with an economic cut-off grade of 17%. The drill program is currently limited to a depth of 100 metres. However, over the next 10 years, the resource estimate may expand once the company expands its drill program to explore depths greater than 100 metres.

After Aluminerie Alouette Inc. (a consortium of five world-class aluminum firms, including Rio Tinto Alcan) provided initial technical support in the development of Orbite's process, a formal agreement was structured in November 2009. This agreement entailed Alouette providing Orbite with a \$1 million debt investment in the form of a convertible debenture, repayable in alumina. Also included in the agreement is that Alouette supplies Orbite with certain equipment and assists in developing and optimizing Orbite's process for producing smelting grade alumina. A separate agreement specifies that Orbite will preferentially supply Alouette with this alumina.

A separate letter of intent signed with Amalgamet Canada (subsidiary of Amalgamated Metal Corporation) covers the potential distribution of Orbite's ultra-pure alumina throughout the world.

## HOW THE TECHNOLOGY WORKS

In its pilot plant, Orbite has demonstrated that its technology is capable of refining alumina from deposits of aluminous claystones. This concept had previously been attempted by others in the industry, but had failed to produce at a cost and quality of alumina competitive with the alumina that is produced from bauxite ores. Refining alumina from bauxite ores is currently done through the Bayer Process, a methodology that has advanced little since its invention in the late 1800s. Orbite's claystone processing invention is truly revolutionary if it is proven at commercial scale to produce at a lower cost than the bauxite-based Bayer Process. **If achieved, not only will the Quebec aluminum industry benefit, but Orbite's technology may be utilized at claystone-based deposits in countries such as China, Russia, and Australia.**

The inability to eliminate iron and other impurities from rocks of clay in an economic and environmentally acceptable manner has prevented others from commercializing a process to extract alumina from aluminous claystone.

Orbite's process mechanically crushes the claystone, and acid leaches at room temperature. The mechanically crushed claystone is further acid-leached at above 100° C while using high pressure followed by distillation of the leachate and recovery of over 90% of the acid. Iron is precipitated out of the concentrated leachate at a very high pH level leaving behind an aluminum-rich liquid. The pH of the liquid is then increased. Following this, the liquid solution is further refined by liquid extraction to yield metallurgical aluminum-ion. The metallurgical aluminum-ion is then oxidized and treated thermally to produce alumina in right consistency for metallurgical

plants. Orbite has close to 95% recovery rate of the aluminum, and nearly 100% recovery rate of iron. To achieve ultra-high purities Orbite can selectively pull out other impurities to achieve specialty grade (99.999%) alumina.

## SECRET SAUCE IS SOLVENT EXTRACTION OF IRON AND OTHER IMPURITIES

We believe that the “secret sauce” of Orbite’s process is its knowledge and ability to adjust pH levels to selectively extract different elements in solution. Management has indicated that this process will eventually be proven out to allow for economic extraction of other high-value materials from the ore such as scandium, gallium, and titanium.

## EXCITING RESOURCE DISCOVERY POTENTIAL AT GRAND VALLEE

Orbite owns the mineral rights to a 6,441 hectare (64 sq. km) claystone property that is rich in aluminous ore. The property is strategically situated 32 kilometres northeast of Murdochville, in the Gaspé region of Quebec which is directly across the St. Lawrence River from the heart of Quebec’s aluminum refining industry. The property is close to both a major road and to multiple year-round deep water ports on the St. Lawrence River, the channel for delivery of alumina to all of Quebec’s aluminum smelters, and the shipping line to smelters in Europe and North America.

The deposit is composed of red claystone and shale, with aluminous material accessible directly at the surface. The alumina-containing claystone exists to a depth of at least 100 metres. This allows for open-pit mining as the material is highly homogenous, with minimal over-burden. Five 500 hectare units have been segmented over four zones, and have been identified as the primary mining zones.

From 2008 through 2010, Orbite conducted geological exploration campaigns covering only a part of the property. The most up-to-date resource report from an independent geologist quantified the size of the resource at approximately 1 billion tonnes of alumina at a grade of 23.13%  $\text{Al}_2\text{O}_3$ . The report expressed the view that a 103 million tonne resource at a grade of 24.6% of aluminum oxide would be sufficient to produce 500,000 tonnes per year for over 40 years. Furthermore, the report stated that some very strict assumptions were used in quantifying this resource, and that removing some of these strict constraints could result in easily multiplying this resource by three or four. We also understand that preliminary resource reports were based on approximately 5% (3.5 sq. km) of Orbite’s 6,441 hectares of mining rights. **A more extensive drilling program has been completed and an updated NI 43-101 compliant resource estimate has significantly increased the resource to 1 billion tonnes.** The grade of the deposit has declined only slightly from 24% to 23%  $\text{Al}_2\text{O}_3$ , but is still said to be highly homogenous.

To put these numbers into perspective, one 3,000 tpd metallurgical plant would produce 900,000 tonnes of alumina per year. Therefore, further refining this exploration work could ultimately suggest that Orbite has more than enough resource available within its mining resource to support enough alumina production to displace 100% of Quebec’s bauxite-based imports. This updated resource value is understood to provide sufficient supply for 7+ full-scale smelting grade alumina producing plants.

Although future resource reports are necessary, management has indicated to us in our meetings that it believes rare earth grades and extraction potential will be proven out. Management has also indicated that other highly valuable rare metals are present in the ore, with scandium and gallium showing up in previous exploration studies at grades of 20 grams/tonne and 38 grams/tonne, respectively. **Because of the soft nature of the claystone, the rock may be extracted with a backhoe; drilling and blasting are not required.**

## COMPETITIVE ADVANTAGES

### A LOWER-COST APPROACH TO ALUMINA EXTRACTION AND PROCESSING

According to Orbite's engineering design and pilot plant work thus far, the company is targeting a cash cost of operating the metallurgical plants to be approximately less than half of the \$280 cost per tonne or (\$140/tonne) incurred by bauxite-based alumina producers. This cash cost also includes Orbite's mining cost of removing the ore from the deposit and transporting to the processing facility. Part of Orbite's economic advantage will come from a low cost of electricity, but a more important aspect of its cost advantage has to do with a more efficient extraction process that intelligently makes pH acidic adjustments to selectively remove impurities and other metals from the ore. It is encouraging to note that the company's February 17, 2011 press release indicated that "production of the first tonne of alumina has validated critical production cost assumptions and efficiency."

### GEOGRAPHICAL ADVANTAGES

**Orbite is capitalizing on establishing its operational focus within the aluminum production belt of the St. Lawrence.** This area is a world-leading jurisdiction of aluminum production, with 12% of global aluminum supply. Therefore, with Orbite's resource and processing plants located in the Gaspé Peninsula, the company has tremendous potential to significantly reduce transportation costs. Presently, alumina concentrate is shipped into Quebec at a cost of about \$100/tonne (varying with the price of fuel) as the alumina feedstock (bauxite) originates from the Caribbean and other tropical regions.

Another attractive aspect of its St. Lawrence resource and preliminary pilot plant is the low cost of power that is required for the alumina smelters. The province of Quebec offers its residential and industrial users the lowest electricity rates of any area in North America due to the abundance of hydroelectric plants.

### ENVIRONMENTAL ADVANTAGES

The flooding of the toxic red mud in Hungarian villages this past year is a recent tragedy that showcases another advantage of Orbite's process. This red mud was being stored in tailing facilities of the alumina refineries in Hungary which had been producing alumina from bauxite ores. When high rain levels caused the red mud to escape the tailing facilities and enter into surrounding villages, fatalities resulted. **Orbite's process produces red mud as the solid waste product which is chemically neutralized to minimize environmental impact.**

### STRONG PATENT PROTECTION

Three families of patents include those that have been issued, plus future patents pending approval. An international patent has been secured covering many of the most crucial aspects of Orbite's processes. This international patent covers the key territories of Australia, Brazil, China, Europe, the U.S., India, Japan, and Russia. Patents have also been secured for Canada and the U.S. for all claims submitted. The U.S. patent protection includes a unique signature for alumina and aluminum produced with the process, thus guarding against any patent infringer attempting to market in the U.S.

### RELATIONSHIPS WITH MAJOR ALUMINA INDUSTRY PLAYERS

One of Orbite's key strengths is its relationships with important alumina industry players, within both the Smelter Grade Alumina (SGA) and high-purity alumina sectors. Alouette's financial involvement and its engagement in the technological development of the processing technology is a testament to Orbite's bright

prospects. This has also been the case on the high-purity side as the company has been in continued discussions and negotiations with the leading purchasers of high-purity materials in the world. These are Fortune 500 companies that are leading manufacturers of LED and fibre-optic products, and their involvement in product testing also adds a considerable amount of credibility to Orbite's technology.

### **POLITICAL SUPPORT FROM THE QUEBEC GOVERNMENT**

The Quebec Government has expressed great interest in the development of a competitive domestic alumina supply in the province to increase the scale and strategic presence of its aluminum industry. **It has been said that the displacement of imported alumina would increase Quebec GDP by up to 3%, equivalent to twice the projected impact of the province's shale gas potential.**

Orbite has received a commitment of financial support from the Quebec Government for \$2.15 million for the large-scale pilot plant facility, while the Federal Government has committed approximately \$1 million.

In terms of permitting, the Quebec Government has indicated to Orbite that permits may be authorized for individual plants having 3,000 tpd capacity.

### **COMMERCIALIZATION PLAN**

#### **DEPLOY AND TEST SGA PRODUCTION FOR CONSISTENCY**

Most of the metallurgical alumina (SGA) produced at the plant during the pilot phase will be sent to Quebec's Alouette smelter for testing. This 6-month testing period is necessary for the aluminum refineries in Quebec to gain confidence that Orbite can consistently produce a high-quality alumina product that may be fed into the smelters.

#### **EXTEND STRATEGIC ALLIANCE WITH OTHER METALLURGICAL AND HP ALUMINA USERS**

The goal of the testing period is to enter into long-term off-take agreements with the aluminum refinery companies. This is a vital step as each of Orbite's SGA plants are to be built with capacities of 3,000 tpd, requiring total construction costs of \$300 million. Approximately 80% of this capex will be financed with debt, and therefore the off-take agreements will be a crucial component in sourcing this debt.

#### **EXPLORE FURTHER ECONOMIC ALTERNATIVE USES OF THE PROCESS**

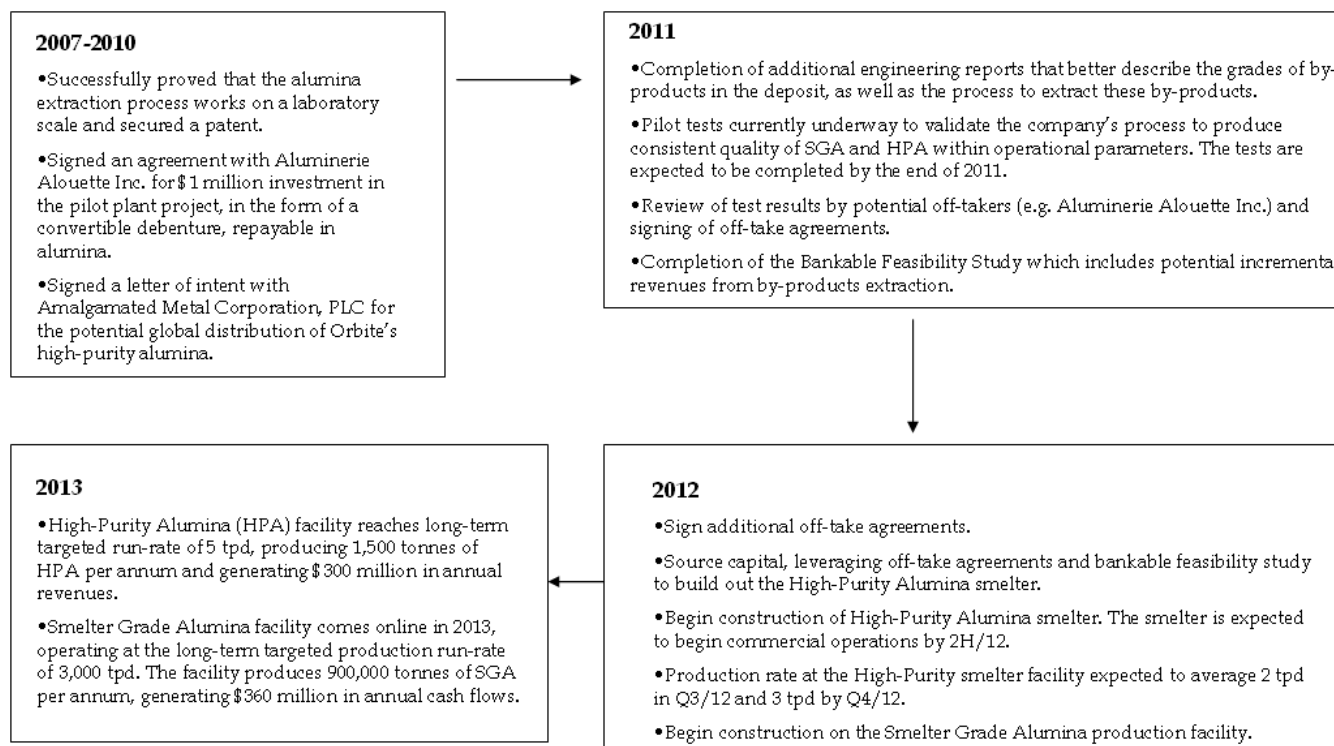
This pertains to the production of high-value industrial materials other than alumina, including scandium, gallium, and titanium. Currently, lab testing is underway to validate the company's extraction of these valuable elements from the Gaspé claystone deposit. Following this testing, the company believes that the technology may also be proven to extract alumina from bauxite ores.

#### **INVESTMENT TO INCREASE PRODUCTION RATE OF THE HP ALUMINA AT CAP-CHAT**

A test and review process similar to that being conducted on metallurgical alumina will be performed with potential high-purity alumina customers. However, due to the much lower capex requirement of a 5 tpd HP plant (approximately \$20-\$25 million) compared to the potential for a remarkable annual cash-flow run-rate exceeding \$200 million, an off-take agreement and the sourcing of construction debt are regarded as less of a hurdle.

Currently, the plant at Cap-Chat has the capability to produce one tonne per day when setup to produce either smelting grade alumina (SGA) or high-purity alumina (HP). This rate is based on the plant operating one shift per day, and official commercial operations are targeted to begin in Q1/12. A \$5 million capital investment will then be made to bring the plant to two shifts per day plus new equipment by Q3/12, followed by another \$5 million investment to add more equipment and one more shift such that the plant is producing 3 tpd by Q4/12. Finally, by Q1/13, the plant is expected to reach the peak rate of 5 tpd once another \$10 million is invested, for a total investment of \$20 million in the high-purity plant.

**Figure 3: Path to Commercialization**



Source: Company reports, Mackie Research Capital

## METALLURGICAL PLANT BUILD-OUT

While the smelting grade alumina (SGA) plants are assumed to generate less cash flow and earn lower returns than the high-purity plant, the SGA market has considerably higher volumes. This presents a larger expansion opportunity. Currently, Quebec's aluminum refineries require 6 million tonnes of SGA per year, and this is expected to grow to 10 million tonnes within the next five years. In addition, export opportunities are believed to be available to supply an expanding aluminum manufacturing industry overseas. Orbite plans on penetrating this market by supplying alumina at a lower cost than bauxite-originated product, and having a 3,000 tpd alumina production plant in operations by Q1/13. For each of the nine years after, the company plans on bringing another 3,000 tpd metallurgical plant into production. Initial strategic alliances are expected to play a crucial role in being able to raise the first \$300 million of the required capex to build the first plant, in addition to the \$100 million of capex required to develop the claystone mining operation. Management targets an 80% debt capitalization on the construction costs of each of the 3,000 tpd plants, and expects the off-take agreements signed with strategic partners to play an important role in securing these financings.



## THE INDUSTRY OPPORTUNITY

### HIGH-PURITY ALUMINA INDUSTRY OVERVIEW

High-purity alumina is metallurgical alumina oxide that has been further refined to a higher purity of 99.99% or better. In other words, it is a powder with 99.99% or higher alumina content.

**Worldwide market:** We estimate the current annual size of the high-purity alumina market to be about 7,500 tonnes. With little available data, we have relied on several sources and discussions with industry experts, including personnel at USGS, Alcan, Sasol, and Baikowski, to derive our estimate for the high-purity alumina market size.

**Suppliers:** Sumitomo Chemical enjoys nearly a 50% market share in the field of high-purity alumina for LEDs. Other leading suppliers include Baikowski and Sasol.

**Uses:** High-purity alumina is used in several growth industries which include LED lights, PCs, semiconductors, artificial sapphires and rubies for fiber optic communication systems, coating of missile nose cones, ultra-pure nano-materials, and bio-ceramics for prostheses and implants.

**Growth rate:** We anticipate the high-purity alumina market to grow at approximately 7% CAGR, primarily driven by its use in the LED market. This growth rate is based on discussions with leading industry participants. Furthermore, we are encouraged that Sumitomo is looking to expand its current capacity of high-purity alumina. While Sumitomo has not officially disclosed its expansion plan, we understand that it aims to increase its high-purity alumina production capacity from 1,000 tonnes annually to 1,500 tonnes annually. This is a fast-growing market that is constrained by availability of material.

**Pricing:** The pricing of high-purity alumina varies based on its purity level, as well as the surface area of the alumina oxide powder, and can range from US\$75,000/tonne to US\$1.8 million/tonne. We have compared Orbite's product specifications with similar products by other manufacturers. For example, SkySpring Nanomaterials sells 1 kg of 99.999% alumina with a particle size of 0.5-10 microns for US\$396/kg or US\$396,000/tonne. As this is a highly specialized and small market, it is believed that the pricing for high-purity alumina is not as volatile as that for metallurgical grade alumina and aluminum. We estimate that the company should be able to realize an average selling price of US\$200,000/tonne of high-purity alumina.

### METALLURGICAL GRADE ALUMINA INDUSTRY OVERVIEW

**Alumina use:** Aluminum represents the second largest metals market in the world and is the eighth most abundant metallic element in the earth's crust after silicon. However, it does not exist in its pure form and is usually mixed with silica and iron. Approximately 4 tonnes of bauxite are required to produce 2 tonnes of alumina, and 2 tonnes of alumina are required to produce 1 tonne of aluminum. Alumina is extracted from bauxite using a chemical process and then undergoes an electrolytic process to produce aluminum.

**Bauxite ores have been the only source of alumina:** Dating back to the late 19th century when aluminum production began, alumina has been entirely sourced from bauxite ores originated in the top producing countries including Australia, China, Brazil, Guinea, and Jamaica. Alumina has been extracted from the bauxite ores using the Bayer Process. This multiple mechanical and chemical process is costly, and the technology has changed little since it was first invented.

**Global market size:** According to USGS, bauxite reserves are distributed around the world and assessed at about 72 billion tonnes, with annual production of approximately 160 million tonnes. According to consultant CRU, 23 mining operations in 12 countries represent 70% of global bauxite production. In 2008, 82 million tonnes of alumina were sold, representing a market size of about US\$33 billion. The demand of alumina decreased in 2009 due to the recession, but recovered in 2010 to 81.7 million tonnes, according to CRU.

**The Quebec opportunity:** Twelve percent of the world’s aluminum production capacity is located along the St. Lawrence River, directly across from Orbite’s mining claims in the Gaspé Peninsula of Quebec. Quebec produces approximately 3.5 million tonnes of aluminum, a process that requires over 7 million tonnes of alumina. Currently, Quebec has only one smelter, Jonquiere (Vaudreuil), that produces about 1.5 million tonnes of alumina. Therefore, approximately 5.5 million tonnes of alumina is imported annually, such that the value of imports approximates \$3 billion. According to the Aluminum Association of Canada, this market size in Quebec is believed to grow to 10 million tonnes within five years. The first of Orbite’s 3,000 tpd SGA plants is expected to produce 900,000 tonnes of metallurgical alumina per year, representing 13% share of the current Quebec market. The abundance of accessible argillite resources in the Gaspé Peninsula makes this an ideal location for the deployment of Orbite’s alumina extraction technology.

**Growth:** We expect to see an increase in the demand for aluminum, and in turn alumina (Figure 4). There is a strong positive historical correlation between economic prosperity and aluminum consumption. For example, in developed countries, consumption is about 20 kg per capita. However, in India it is 1 kg, while in China it is 10 kg. As the affluence of these growth economies increases, higher demand for aluminum is forecasted. Furthermore, every kilogram of aluminum used in the manufacture of cars, aeroplanes, and trains results in a 20 kg reduction in greenhouse gas emissions over the life of a vehicle. Therefore, a move towards a more environmentally conscious economy is expected to result in further demand for aluminum. The devastating natural disasters in China, Australia, New Zealand, and more recently in Japan will require significant rebuilding of infrastructure, which should lead to increased long-term demand for aluminum.

**Figure 4: Long-term Aluminum Demand Growth**

**Long-term Aluminum Demand Growth**

CAGR	Past 10 years	Next 10 years
NA, Europe, Japan	1.5%	2.0%
China	18.2%	12.5%
Rest of the World	6.0%	6.0%
Total	5.4%	7.0%

*Source: Davenport & Company LLC, Aluminum Associate Spring Meeting 2008*

At a CAGR of 7%, the world demand for alumina should exceed 150 million tonnes per annum in 2020. **Compared to the current supply of 82 million tonnes, a 7% CAGR should result in a build-out of 88 new 900k tonne smelters by 2020.** This would lead to doubling of the current industry size by 2020. We use 900k tonne smelters in the example above as that is the targeted production rate by Orbite.

**Supply concerns:** There is growing concern amongst leading consumers of alumina around the world that existing resources of bauxite are becoming increasingly difficult to secure due to increasing consumption of aluminum. The table below (Figure 5) from CRU further illustrates the tight supply and demand dynamics.



Figure 5: Historical Aluminum Supply and Demand Relationship

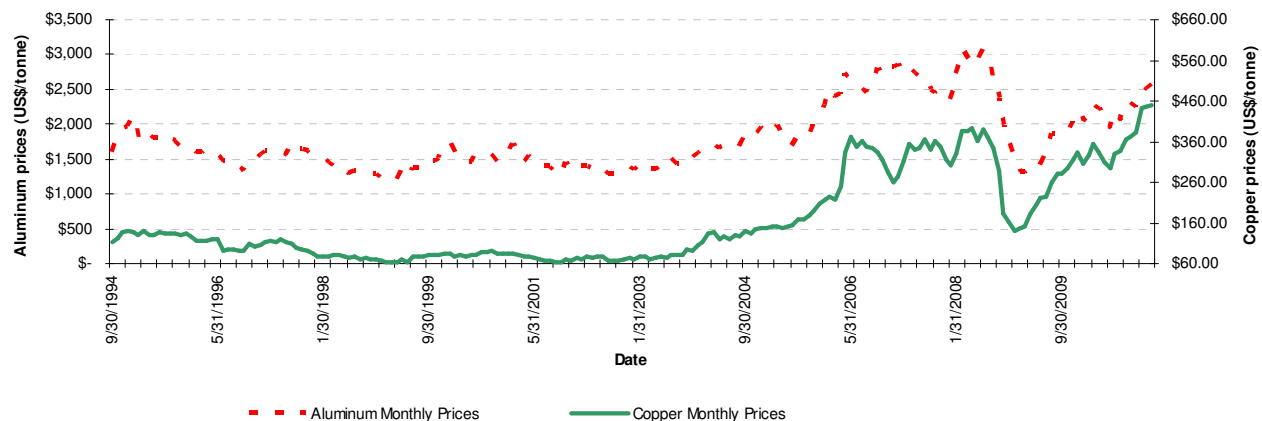
WORLD PRODUCTION & CONSUMPTION			
	2008	2009	2010
<b>WORLD POSITION ('000 TONNES)</b>			
World Production	40,131	37,683	41,301
World Consumption	37,420	34,305	38,662
<b>WORLD BALANCE ('000 TONNES)</b>			
China	2,711	3,377	2,639
ex-China balance	583	1,222	691
	2,128	2,155	1,948
<b>STOCKS ('000 TONNES)</b>			
Reported stocks	4,357	6,021	6,902
Reported stocks: consumption ratio (days)	55	112	115

Source: CRU

We believe that the supply and demand situation of aluminum is going to be further aggravated by new measures by the Chinese government to ration energy consumption amongst industries. Last year, these policies resulted in shutting off power to aluminum smelters in China. As a result, Chinese production of aluminum decreased from 17.5 million tonnes to 14.5 million tonnes. According to alunet.com, Alcoa has recently predicted that Chinese demand will outstrip its production by 700,000 tonnes. Alcoa further forecasts that global consumption of aluminum will increase by 12% in 2011. This has created an opportunity for the rest of the world to increase production of aluminum, and we believe that Orbite is well positioned to benefit from this opportunity.

**Pricing: We remain bullish on aluminum and hence alumina prices, and expect further increases from current price levels.** In recent years, contract alumina has been priced at 11%-17% of the price of aluminum and a move to spot pricing for alumina is also underway. Despite aluminum being the second most used metal in the world, prices of copper have significantly outperformed aluminum over the last 12 months. Copper prices have increased threefold compared to 1994 price levels, while aluminum prices have increased only 1.6 times during the same time period (Figure 6). **The record copper prices may further spur end-users to use aluminum as an alternative.** According to the Japanese Electric Wire & Cable Makers' Association, shipments of aluminum wires increased 48% for the year ending March 31 2010, while shipments of copper-based products fell 13% to 596,250 tonnes. **Alcoa predicts that if copper prices continue to rise, aluminum could end up being substituted for 20% of the global 19 million tonnes annual refined copper market.** Rio Tinto PLC estimates that high copper prices have led to copper substitution losses of about 425,000 tonnes per year over the last five years.

Figure 6: Aluminum versus Copper Prices



Source: Bloomberg, Mackie Research Capital

## OTHER HIGH VALUE METALS - SCANDIUM INDUSTRY OVERVIEW

The company's claystone deposit also contains other high value rare metals such as scandium, gallium and rare earths. The company intends to release additional engineering reports in the near-term that better describe the grades of these by-products in the claystone deposit, as well as the process to extract these by-products. We do not currently include the upside potential from the extraction of these rare metals in our base case valuation.

**Worldwide market:** Scandium is produced as a by-product of uranium, rare earth, and platinum group elements (PGE) mining due to its low concentration in ores. The world production of scandium is approximately 5,000 kg; 2,000 kg of the total demand is met through recovery from mine tailings, particularly from tantalum deposits and uranium ore tailings. The remaining demand is met from the stockpiles of the former Soviet Union where scandium is extracted from uranium tailings.

**Suppliers:** Ukraine is currently the biggest supplier of scandium as it hosts military stockpiles of the former Soviet Union. According to USGS, there is no primary production in the Americas, Europe or Australia, even though significant scandium deposits are associated with uranium, nickel-copper-cobalt laterite deposits, and with ultramafic rocks worldwide. However, scandium is produced as a by-product in China, Kazakhstan, Russia and Ukraine.

**Uses:** Scandium is used in mercury vapor lamps to produce high-intensity light used for camera and stadium lighting. Scandium is also alloyed with aluminum to produce lightweight, strong, and high-performance materials used in such items as aluminum baseball bats, bicycle frames, and aerospace and military equipment.

**Growth rate:** The growth rate for scandium demand has been quite limited due to the lack of primary production. However, Daniel J. Cordier at USGS predicts that the demand for scandium can increase substantially if primary production of scandium is brought online. Scandium can be used as an effective substitute for titanium in the aerospace industry.

**Substitution:** There are no effective substitutes to scandium for its lighting and laser applications. However, titanium, aluminum alloys, and carbon fiber may be used as a substitute for use in athletic equipment and sporting goods.

**Pricing:** According to Daniel J. Cordier of USGS, production out of Russia is declining, so the world is once again dependent on production out of China. This could put supply pressure on scandium, driving up the metal's price. The table below (Figure 7) shows that the prices of scandium products have been quite stable historically.

**Figure 7: Market Prices of Scandium**

**Market Price of Scandium (in U.S. dollars)**

Product	Purity	Per Weight	2006	2007	2008	2009	2010E
Scandium Oxide	99	Kg	700.0	700.0	900.0	900.0	900.0
Scandium Oxide	99.9	Kg	1,400.0	1,400.0	1,400.0	1,400.0	1,400.0
Scandium Oxide	99.99	Kg	1,450.0	1,620.0	1,620.0	1,620.0	1,620.0
Scandium Oxide	99.999	Kg	1,500.0	2,540.0	2,540.0	2,540.0	2,540.0
Scandium Oxide	99.9995	Kg	2,100.0	3,260.0	3,260.0	3,260.0	3,260.0
Dendritic Metal	***	Gram	208.0	208.0	188.0	189.0	193.0
Metal Ingot	***	Gram	131.0	131.0	152.0	155.0	158.0
Scandium Acetate	99.99	Gram	74.0	74.0	n.a	n.a	47.0
Scandium Chloride	99.9	Gram	48.7	48.7	57.4	60.4	62.4
Scandium Fluoride	99.9	Gram	193.8	193.8	224.2	224.6	229.0
Scandium Iodide	99.999	Gram	174.0	174.0	201.0	203.0	207.0
Scandium-Aluminum Alloy	***	Kg	n.a.	74.0	74.0	74.0	74.0

Source: USGS 2011

## OTHER HIGH VALUE METALS - GALLIUM INDUSTRY OVERVIEW

The importance of gallium is demonstrated by the fact that it is on the critical strategic metals list of both the U.S. Department of Energy and the European Union. This implies that gallium has been identified as having high economic importance.

**Worldwide market:** Gallium occurs in very minute concentrations in ores of other metals. According to USGS, it is estimated that the world resources of gallium exceed 1 billion kilograms and that considerable quantity can be extracted from the world's bauxite and zinc reserves. The Indium Corporation estimated that the global supply of gallium totalled 207 tonnes in 2010, with primary production of 125 tonnes supplemented by an additional 82 tonnes of recycled gallium. This compares with refinery capacity of 162 tonnes and recycling capacity of 129 tonnes. This implies that there is sufficient capacity to meet current demand. However, given its use in high-growth industries, there is a possibility of supply shortages over the next few years.

**Suppliers:** GEO Gallium is the largest refiner of gallium products. In China, the largest producer is Aluminum Corporation of China Ltd. with production capacity of 20 tonnes per year. Other notable Japanese producers include Sumitomo Chemicals and Dowa Mining Ltd. The use in high growth rate applications has led to Nalco, an Indian-based aluminum manufacturing company, to consider plans to build out a refinery to purify gallium to 6N and processing spent liquor from alumina production for its gallium content to 3N gallium. Further, Gold Canyon Resources Inc. intends to develop the world's first primary gallium mine on its Cordero project in Nevada. A double-digit growth rate for gallium demand is expected.

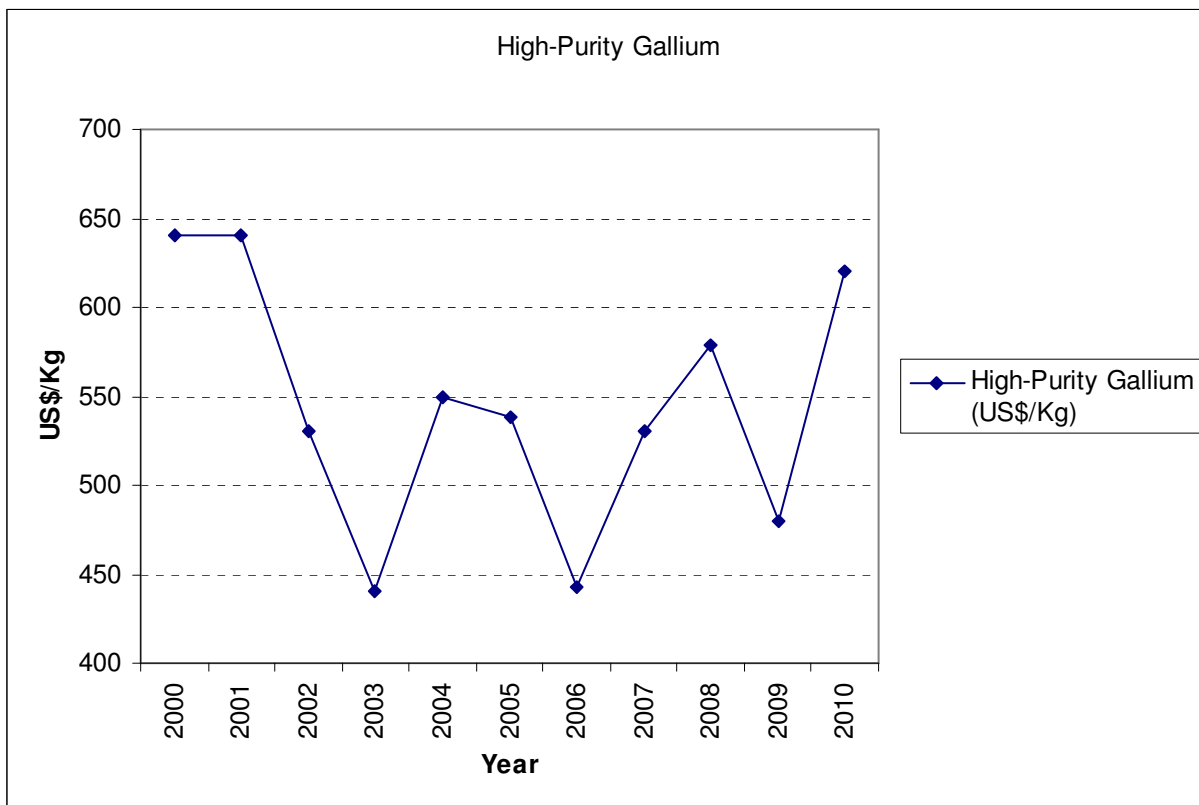
It is interesting to note that only 10% of alumina producers extracted gallium as a by-product of alumina processing in 2010. The remaining producers found it too expensive to extract the gallium, and treated it as an impurity in the aluminum refining process. USGS and Evans predict that about 118 tonnes of additional supply of gallium would come online between 2010 and 2015, leading to total supply of 325 tonnes by 2015.

**Uses:** Gallium is used in integration circuits, and optoelectronic devices such as LEDs and Blu-Rays. In 2010, USGS estimates that about 64% of the gallium was consumed in integrated circuits in the U.S., while 35% of the gallium demand came from optoelectronic devices such as laser diodes, LEDs, photo detectors, and CIGS (copper indium gallium selenide) solar cells. According to the U.S. Department of Energy, the United States currently imports gallium from Germany (24%), Canada (20%), China (16%), and the Ukraine (12%).

**Growth rate:** According to USGS, Gallium demand is driven primarily by its use in cellular handsets and other high-speed wireless applications. Industry analysts predict that the global telecom market is expected to grow at a 15%-25% CAGR over the next several years. The rapidly growing high-brightness LED industry remains a key growth driver for gallium demand. We expect that the market demand for gallium to grow at a CAGR of at least 10% over the next several years given its use in high-growth sectors.

**Pricing:** Gallium prices were reported to be about US\$600/kg in 2010 (Figure 8). We expect growth in the LED market to put upward pressure on gallium prices over the next several years.

**Figure 8: Gallium Prices in US\$, 2000-2010**



Source: USGS

## VALUATION

### TARGET PRICE BASED ON OUR NAV CALCULATION

We have arrived at a 1-year target price of \$7.50 based on our NAV calculation (Figure 9). We combine target valuations of the high-purity and the metallurgical plant to arrive at this figure. In this base-case valuation, we do not include several additional value-creating levers, including resource value, licensing, and other growth opportunities. However, we have quantified the remarkable upside if one includes these factors into a base case in Figure 10. We list our key assumptions for both plants below:

#### High-Purity plant assumptions:

- Peak production rate of 5 tonnes per day (tpd) to be achieved in 2013.
- A gradual increase to 2 tpd by end of Q2/12, and 3 tpd by end of Q3/12.
- Number of operating days per year equals 300.
- Average selling price of \$200,000 per tonne of High-Purity Alumina (could be conservative based on discussion in this report's industry analysis section).
- Operating expense per tonne at the High-Purity Alumina smelter of \$1,000.
- Target P/E multiple of 15x on 2013 earnings, inline with a group of alumina and aluminum companies.
- Maintenance capex of \$10 million per year.
- Discount rate of 15% equivalent of Orbite's Weighted Average Cost of Capital (WACC).
- Capex of \$20 million.

#### Smelter Grade Alumina (SGA) plant assumptions:

- Peak production rate of 3,000 tonnes per day (tpd) to be achieved in 2013.
- Number of operating days per year equals 300.
- Average selling price of \$400 per tonne of SGA, inline with current pricing in the market.
- Operating expense per tonne at the SGA smelter of \$166.
- Target P/E multiple of 15x, inline with a group of alumina and aluminum companies.
- Maintenance capex of \$10 million per year.
- Discount rate of 15%.
- Capex of \$300 million.

**DCF valuation highly attractive:** Plugging these inputs into the cash-flow model results in a target price of \$7.50. To arrive at this number, we calculate a P/E derived value of Orbite, and average this result with the DCF result to come up with a target valuation for each of the high-purity plant and the SGA plant. After adding these two averages together, we then subtract an incremental \$100 million of capex estimated by the company that will be required to build-out the claystone mining infrastructure. Of this \$100 million, \$20 million is upfront cost and the remaining cost is expected to be spread out over 20 years. We estimate the NPV of this \$100 million to be \$45 million at a discount rate of 15%. These figures are summarized in the

table below in Figure 9. In addition, we have provided DCF summaries for both Smelter Grade Alumina (SGA) and High-Purity Alumina in Figures 16 and 17 in Appendix 2.

**Figure 9: Target Valuation Summary**

		<b>Value Per Share</b>
<b>High Purity Plant at Annual Run Rate (achieved in 2013)</b>		
Prodn rate (ton/day)	5	
Days/ year	300	
Production (ton/year)	1,500	
Price (\$C/ton)	200,000	
Revenue (\$Cmm)	300	
Operating expense (\$C/ton)	1,000	
Net income (\$Cmm)	208	
P/E valuation multiple	15x	
Intrinsic Value of Market Cap (unrisked)	\$3,127	\$16.09
Intrinsic Value of Market Cap at a 30% probability	\$938	\$4.83
DCF Value	\$1,014	\$5.22
Average of DCF and P/E	\$976	\$5.02

		<b>Value Per Share</b>
<b>Metallurgical Plant at Annual Run Rate (achieved in 2013)</b>		
Prodn rate (ton/day)	3,000	
Days/ year	300	
Production (ton/year)	900,000	
Price (\$C/ton)	400	
Revenue (\$Cmm)	360	
Operating expense (C\$/ton)	166	
Net income (\$Cmm)	133	
P/E valuation multiple	15x	
Valuation per share (unrisked, in \$Cmm)	\$1,997	\$10.26
Valuation risked at a 30% probability (\$Cmm)	\$599	\$3.08
DCF Value	\$501	\$2.57
Average of DCF and P/E	\$550	\$2.83

Upfront mine setup investment (\$Cmm)	(\$45)	(\$0.23)
<b>NAV (HP plant+ SGA plant+ mine investment)</b>	<b>\$1,481</b>	<b>\$7.62</b>

Source: Mackie Research Capital

**Analyzing additional valuation drivers:** Figure 10 shows the incremental NPV/share that could be added to our target price if we were to use a 50% probability instead of a 25% probability in our P/E approach. Higher high-purity alumina prices, higher P/E multiples, value of other rare metals (scandium and gallium), discount rates, and resource values are all additional levers where we have been conservative, and adjusting for these items has the potential to materially increase the valuation that Orbite is ultimately able to achieve.

Figure 10: Incremental Valuation Upside

Valuation Scenarios	<u>Additional NPV</u>	<u>Additional NPV/sh</u>
50% probability factor applied to HP plant (up from 30%)	312	1.60
50% probability factor applied to SGA plant (up from 30%)	200	1.03
30x P/E multiple up from 15x	768	3.94
Market price (\$300k) of HP alumina	510	3.02
Scandium and Gallium Sales	254	1.30
10% discount rate in DCF versus 15%	449	2.31
892mm tonnes of "unallocated" resource	4,458	22.95
Build-out of 9 more SGA plants in Quebec	1,205	6.22
SGA upfront capex doubles	(117)	(1.01)
HP upfront capex doubles	(8)	(0.05)
Additional value over the base case	<u>8,030</u>	<u>41.31</u>

Source: Mackie Research Capital

## COMPARABLE VALUATIONS

Valuations of alumina and aluminum producers are shown below in Figure 11. The group average P/E multiple on current year's earnings is in the mid-teens range, and supports our selection of a 15x target P/E multiple in our sum-of-the-parts valuation for Orbite. Considering Orbite's premium growth prospects and innovative technology, a strong case can be made that a 15x target multiple for the company is overly conservative.

**Analyzing peer P/CF multiples also demonstrates additional upside potential to our \$7.50 target price:** From a Price/Cash Flow perspective, Orbite's valuation is also attractive. As shown in the financial analysis section of this report, Orbite should generate approximately \$2.00 of cash flow per share in 2013. Considering that a 5x operating cash-flow multiple is at the low end of the range at which peers trade, this supports a \$10.00 per share valuation, suggesting that our target price may prove overly conservative. In terms of business model, Alumina Limited is arguably the most comparable company to Orbite because Alumina Limited is also focused entirely on alumina production, and not further down the value chain into aluminum, and thus generates much higher returns. Alumina Limited trades at a 12x P/CF multiple, which implies that there could be a significant upside from our current target price for Orbite.



Figure 11: Comparable Companies

	Alumina Producers and Aluminum Refiners					AVERAGE
	Aluminum Corp. of China Limited	United Company RUSAL	Alcoa Inc.	Noranda Aluminum Holding Corporation	Alumina Limited*	
<i>In millions, except per share data</i>						
Symbol	2600	486	AA	NOR	AWC	
Currency	CNY	US	US	US	US	
Share Price	6.16	1.66	16.01	14.12	2.18	
Market Cap	24,275	25,282	17,014	944	5,320	
Shares Outstanding	3,944	15,193	1,063	67	2,440	
<b>INCOME STATEMENT</b>						
Sales	120,995	8,165	21,013	1,295	2,183	
Sales Growth, %	72.2%	-47.9%	14.0%	68.2%	34.0%	28.1%
Gross Margin, %	6.3%	17.8%	na	14.0%	17.0%	13.8%
EBITDA %	4.3%	-7.6%	12.9%	12.8%	15.0%	7.5%
Operating Margin, %	3.4%	-14.8%	6.0%	5.2%	7.0%	1.4%
Net Income %	0.6%	10.1%	1.2%	5.2%	6.0%	4.6%
<b>BALANCE SHEET</b>						
Total Debt	69,444	13,868	9,165	420	464	
Net Debt	60,394	13,653	7,622	386	352	
Shareholders' Equity	57,187	6,332	17,086	296	3,072	
Enterprise Value (EV)	84,669	38,935	24,636	1,329	5,671	
Net Debt/Capital	43%	57%	19%	27%	10%	31.3%
Net Debt/EBITDA (LTM)	20.0x	-22.0x	2.8x	2.3x	nmf	0.8x
Net Debt/EBITDA (FTM)	4.1x	5.2x	1.8x	1.3x	1.5x	2.8x
<b>Valuation Metrics</b>						
EV/EBITDA - previous year	nmf	nmf	9.1x	8.0x	nmf	8.6x
EV/EBITDA - current year	5.7x	14.8x	5.8x	4.5x	24.1x	11.0x
EV/EBITDA - next year	4.9x	11.4x	5.4x	4.4x	18.5x	8.9x
EV/EBITDA - next 2 years	3.6x	11.2x	4.6x	4.2x	15.8x	7.9x
P/S - previous year	0.2x	3.1x	0.8x	0.7x	nmf	1.2x
P/S - current year	0.2x	2.3x	0.7x	0.7x	4.5x	1.7x
P/S - next year	0.2x	2.0x	0.7x	0.6x	4.1x	1.5x
P/S - next 2 years	0.2x	1.8x	0.6x	0.6x	3.0x	1.2x
P/E - previous year	nmf	27.7x	29.6x	16.4x	nmf	24.6x
P/E - current year	23.2x	12.6x	11.7x	8.7x	20.0x	15.3x
P/E - next year	18.1x	8.5x	10.0x	8.4x	15.6x	12.1x
P/E - next 2 years	10.4x	8.1x	8.4x	8.2x	12.7x	9.6x
P/CF - previous year	nmf	55.5x	7.2x	2.7x	27.3x	23.2x
P/CF - current year	6.2x	21.6x	6.4x	4.7x	14.2x	10.6x
P/CF - next year	5.8x	11.3x	5.6x	4.5x	11.8x	7.8x
P/CF - next 2 years	4.7x	9.6x	4.3x	4.2x	10.7x	6.7x

\* Alumina Limited owns 40% of Alcoa World Alumina & Chemicals (AWAC). We have consolidated its share of revenues in the table above and its associated margins for comparison purposes.

Source: Bloomberg, Mackie Research Capital

## FINANCIAL ANALYSIS

### SHORT RUNWAY TO EARNINGS PROFITABILITY AND SIGNIFICANT CASH-FLOW GENERATION

Our financial estimates are summarized below in Figure 12. Orbite has strong potential to generate positive earnings immediately after bringing the high-purity plant online. In the year following the commercialization of the first plant, both earnings (EPS) and cash flow per share (CFPS) ramp significantly higher. When only including one high-purity plant operating at a 5 tpd production rate and one 3,000 tpd SGA plant, Orbite generates an annual run-rate of approximately \$2.00 of EPS and CFPS beginning in 2013.

A total of \$420 million in capital investment is assumed to be required to bring the existing pilot plant at Cap-Chat, Quebec to a 5 tpd producer, and to put one 3,000 tpd SGA plant into operation. This assumes \$20 million,



\$300 million, and \$100 million, respectively, for the high-purity plant, the SGA plant, and the capex required to construct the argillite mining infrastructure.

It is assumed that 100% equity investment is used to finance both the high-purity plant and the upfront investment in the mining infrastructure, while it is understood that Orbite may be able to project debt finance 80% of the investment of the SGA plant. As the table below shows, a combination of equity issuance and cash generated from operations will be used to supply this required equity investment. This financing plan allows the company to reach a peak debt/cap ratio of approximately 60% once both plants enter into production. Amazingly, strong cash generation allows Orbite to reach a net-cash position only after a few quarters of operations. **The cash generating ability of Orbite's business plan, enabled by its processing technology and claystone resource, is a remarkably attractive value proposition.**

**Figure 12: Financial Results and Estimate Summary**

<b>Exploration Orbite</b>									
December 31, year end									
C\$ (000)		<b>2010E</b>	<b>2011E</b>	<b>Q1/12E</b>	<b>Q2/12E</b>	<b>Q3/12E</b>	<b>Q4/12E</b>	<b>2012E</b>	<b>2013E</b>
<b>Income Statement</b>									
Sales:									
Alumina (SMA)		-	-	-	-	-	-	-	360,000
Ultrapure Alumina		-	-	15,000	15,000	30,000	45,000	105,000	300,000
<b>TOTAL Sales</b>		<b>-</b>	<b>-</b>	<b>15,000</b>	<b>15,000</b>	<b>30,000</b>	<b>45,000</b>	<b>105,000</b>	<b>660,000</b>
Gross Profit		-	-	14,940	14,940	29,880	44,820	104,580	536,400
EBITDA		(3,016)	(4,362)	14,159	14,159	29,092	44,025	101,435	509,100
EBIT		(3,016)	(14,700)	11,492	11,492	26,425	41,359	90,768	498,433
Net Income from Operations		(2,976)	(21,695)	6,209	6,209	17,110	28,012	57,540	355,758
<b>Per Share Data</b>									
EPS - excl. unusual items (FD)		-0.03	-0.08	0.03	0.03	0.09	0.14	0.30	1.83
CFPS - fully diluted		-0.03	-0.03	0.05	0.05	0.10	0.16	0.36	1.89
FCFPS - fully diluted		-0.04	-0.84	-0.31	-0.33	-0.27	-0.18	-1.09	1.89
Shares outstanding - fully diluted		83,829	175,750	185,833	189,000	192,167	194,334	190,333	194,334
<b>Balance Sheet</b>									
Cash and short-term investments		9,337	1,568	1,568	1,568	1,568	1,568	1,568	136,914
Total Current Assets		9,359	1,590	1,590	1,590	1,590	1,590	1,590	136,936
Total Current Liabilities		498	77,502	124,646	171,206	206,865	231,623	232,083	498
Total Net Debt		(6,800)	77,973	125,117	171,677	207,336	232,094	232,554	(134,377)
Total Equity		10,815	59,037	75,893	98,333	131,674	170,916	170,456	526,720
Debt to total capitalization		-169.4%	56.9%	62.2%	63.6%	61.2%	57.6%	57.7%	-34.2%
<b>Cash-Flow Statement</b>									
CFO (excl W/C)		-2,316	-4,773	9,012	9,012	19,913	30,814	68,751	366,931
Change in W/C		-1,179	0	0	0	0	0	0	0
Capex		0	143,333	66,667	71,667	71,667	66,667	276,667	0
Total Equity Issuance		9,490	63,333	10,834	15,834	15,834	10,834	53,334	0
Total Debt Issuance		525	77,004	46,821	46,821	35,920	25,019	154,581	-231,585
<b>Operational Assumptions:</b>									
Tonnes Sold of Alumina		-	-	-	-	-	-	-	900,000
Price/tonne (C\$)		400	400	400	400	400	400	400	400
Opex/tonne (C\$)		166	830	830	830	830	830	830	1,494
Tonnes Sold of Ultrapure Alumina		-	75	75	150	225	525	1,500	1,500
Price/tonne (C\$)		200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Opex (C\$)		1,000	5,000	5,000	5,000	5,000	5,000	5,000	9,000

Source: Mackie Research Capital

## CATALYSTS

### A SWITCH BACK TO HIGH-PURITY PRODUCTION AT CAP-CHAT

For the next few months, Orbite will be producing metallurgical grade samples of alumina and optimizing the process at the 1 tpd plant at Cap-Chat, Quebec. The purpose of this pilot project is to provide proof to potential customers, such as Alouette, that the alumina produced from Orbite's Grand Vallee argillite is of a quality at least equivalent with that produced from the bauxite ores. On completion of this testing period, the Cap-Chat plant is expected to begin the commercial production and sale of the higher value and more profitable ultra-pure alumina. This event should be regarded as a critical catalyst because at a 1 tpd operating capacity and a price of only \$200,000, the plant is capable of generating approximately \$40 million of annual cash-flow.

### SECURING OFF-TAKE AGREEMENTS

If a strategic partner such as Alouette is satisfied with the early production from the Cap-Chat plant, we understand that this may lead to a long-term off-take agreement, and possibly an equity injection into Orbite. This off-take agreement should be regarded as an important catalyst as it may allow the project to receive debt financing for SGA plant construction.

### NEW RESOURCE REPORTS TO ADVANCE AND EXPAND THE RESOURCE

Orbite recently received an updated NI 43-101 compliant resource estimate that substantially increases the previous resource range at the Grand Vallee property from 75-300 million tonnes to 1 billion tonnes. This updated resource value is understood to provide sufficient supply for 7+ full-scale smelting grade alumina producing plants. The grade of the deposit has declined only slightly from 24% to 23%, but is still said to be highly homogenous.

### BANKABLE FEASIBILITY STUDY

Orbite expects to receive a Bankable Feasible Study by the end of 2011. This will be a key catalyst, as at this time the company's resources will move from the "indicated" category to the "reserve" category. In addition, this study will allow the company to raise the debt financing required to build out its projects.

### UPDATE REPORTS ON OTHER HIGH-VALUE RARE METAL EXTRACTION POTENTIAL

Orbite has indicated an additional application of its processing technology; specifically, it has the ability to extract other certain high-value metals from the claystone. Management has indicated that grades for rare earth elements (REE) and other high-value metals such as scandium and gallium have become apparent in exploration work. We understand that it is the company's intention to release additional engineering reports that better describe the grades of REE and other high-value metals in the ore. These future engineering reports will also contribute to the claim that extraction of these metals may be achieved at no additional costs over the expense required to extract alumina.

### TAKE-OUT POTENTIAL

The 10 aluminum refineries in Quebec comprise approximately 12% of the world's production of aluminum. According to resource consultant CRU, 37% of the cost to produce one tonne of aluminum is comprised of alumina. Needless to say, these Quebec-based refiners would clearly be interested in acquiring Orbite's processing technology as a low-cost alternative to supplying aluminous-ore for their production of alumina.

Furthermore, the refiners would eliminate the approximate \$100 per tonne cost of importing bauxite ore from locations such as the Caribbean. The refiners, already with a presence in Quebec, would also have an avenue to acquire the Grand Vallee claystone land package owned by Orbite, and process the ore all the way up to aluminum, having a completely vertically integrated operation and relationships with aluminum purchasers.

Aside from the aluminum companies with operations in Quebec, other international companies and investors may recognize the opportunity to also monetize similar argillite lands located in China, Russia, and Australia.

## **RISKS**

### **SMALL MARKET SIZE FOR SPECIALITY PRODUCTS**

Orbite intends to produce high-purity alumina, gallium, and scandium. The market size for these speciality products is quite small and the supply is controlled by a few companies. Therefore, Orbite could find it difficult to penetrate these markets and take market share away from the well-established players in these niche markets. Furthermore, there is a risk of over-supply as these markets are quite small. The prices of these speciality products could decrease if a large supply of these products comes online. Management has indicated that it is in discussions with multi-national companies, and off-take agreements with them for its speciality products could go a long way in reducing the company's risk.

### **COMMERCIALIZATION RISK**

The company is currently engaged in a 6-month pilot project that will determine if the company's innovative process is capable of consistently producing high-quality alumina at a set production rate. Unsuccessful test results could lead to commercialization and off-take agreement delays, up to abandonment of the current venture. The company intends to finance 80% of its \$300 million capex to build its processing facility through debt. It may be unsuccessful in sourcing debt without having bankable off-take agreements in place. In addition, we note that while a successful pilot test is indicative of strong commercialization potential, it does not guarantee that the project will succeed on a commercial scale.

### **PATENT INFRINGEMENT RISK**

Orbite has an international patent protecting its technology. However, a patent does not guarantee that its competitors will not be able to commercialize similar technologies with just enough differences to avoid breaking patent infringement laws.

### **FINANCING RISKS**

Orbite has limited financial resources and would require additional funding for further exploration and development of its facilities. However, the company has a NI 43-101 that shows a reliable estimate of its immense resource at the Grand Vallee property. We believe that it should be relatively easy for Orbite to raise capital at attractive terms to fund its development work if its pilot project is a success.

### **INFRASTRUCTURE RISKS**

The infrastructure build-out can effect capital and operational costs, as well as lead to delays.

## RECESSIONARY ENVIRONMENT

Alumina is used in several cyclical industries. Therefore, the demand and prices of alumina are significantly exposed to the state of the global economy. A recessionary environment would likely lead to lower demand and hence lower prices of alumina. However, we believe that the improving growth trend and increasing use of aluminum from the BRIC countries should lead to increasing demand for alumina.

## EXPLORATION, DEVELOPMENT, AND MINING RISKS

Mining operations and exploration activities are inherently risky by nature. It may take a number of years and substantial expenditure to take the project from the initial drilling phase to commercial operation. The mineral resource estimates, while reliable, are estimates and there is no guarantee that an identified reserve or resource will prove to be a commercially minable deposit. In addition, mining and exploration businesses are heavily regulated and require extensive permitting, which may lead to delays or curtailment of the company's activities.

## INVESTMENT CONCLUSION

**Orbite's technology has the potential to bring about a paradigm shift in the alumina industry.** The company aims to deliver an innovative process for producing alumina from aluminous claystone which results in higher yield, as well as lower production and environmental costs. Technical and financial support of Aluminerie Alouette Inc. (a consortium of five world-class aluminum firms, including Rio Tinto Alcan) lends credibility to the company's patented technology. Furthermore, we are encouraged by the recent successes achieved by the company. Orbite was successful in demonstrating that its process works on a laboratory scale and is now working on a pilot project until the end of 2011 to show that it can produce a consistent quality of high-purity and metallurgical alumina within operating parameters. **Successful test results could lead to the commercialization of an innovative technology that is easily scalable and transferrable.**

As a domestic player located in Quebec, Orbite promises to offer higher quality and lower cost alumina, and hence is well positioned to penetrate Quebec's metallurgical alumina market. Quebec imports almost 6 million tonnes of metallurgical alumina per year. Furthermore, the company intends to sell high-purity alumina, which is much more valuable, and has positioned itself with the Amalgamated Metal Corporation, PLC, to cover the potential distribution of the high-purity alumina. Other revenue streams include production of high-purity gallium and scandium, along with potential lucrative technology licensing agreements.

**We initiate coverage of Exploration Orbite VSPA Inc. with a SPECULATIVE BUY recommendation and 1-year target price of \$7.50 based on our risked NAV calculation.**

## APPENDIX 1: MANAGEMENT AND BOARD OF DIRECTORS

**Accomplished and connected board:** Orbite has seven accomplished leaders on its board of directors. Collectively, the board adds an immense amount of experience. The board also brings very strong networking capabilities in the Quebec political landscape, as well as in the global aluminum industry. Furthermore, management of the company owns 12% of the total basic shares outstanding, and this certainly implies a great alignment of interests with equity holders.

### EXECUTIVE OFFICERS

**Richard Boudreault, President and Director:** Richard Boudreault has an impressive list of accomplishments with start-up and growth companies in the new materials sector. He has a Master of Engineering degree from Cornell University, and an MBA from Université de Sherbrooke. Over the years he has worked in numerous technology-related positions including a subsidiary of Caisse de depot et placement du Quebec.

**Jacques Bédard, Vice-President Finance and Chief Financial Officer:** Jacques Bédard is a senior executive officer with over 25 years of international financial management experience in the high technology, multimedia and medical device sectors. In particular, Mr. Bédard has engineered numerous mergers and acquisitions, in addition to assuring a variety of related financing. He has brought several products and services into production and overseen the Canadian and overseas public offerings of many of the businesses he has worked with. His resume includes terms as Vice-President Finance and CFO for publically traded companies such as Softimage and ART, and he has also held senior management financial positions with Microsoft, among others. Mr. Bédard is a member of Ordre des CGA du Québec and the Certified General Accountants Association of Canada and also holds a Bachelor in Business Administration (accounting) from Université du Québec à Montréal.

**Dr. Joell Fournier, Ph.D., Vice-President Technologies:** Dr. Fournier holds a Ph.D. (chemistry/physics) from Sherbrooke University and a Post-Doctorate from the INRS Energy and Materials Institute. Dr. Fournier joined the National Research Council of Canada in 1996 as industrial material scientist. He was founder and director of CEPROCQ, a Montreal-based technologies transfer research center, until July 2007. Over the past 15 years, Dr. Fournier has published close to 40 papers, is the author of four patents, and has completed over 30 industrial research projects. Within numerous industrial projects, Dr. Fournier (as electrochemist) has been involved in projects related to new technologies for aluminum production.

### BOARD OF DIRECTORS

**Mr. Lionel Leveille (Candiac, Quebec), Chairman of the Board of Directors:** Lionel Leveille was President and CEO of the company Adacel Inc. from February 2001 to July 2005. Adacel is active in the field of aerial navigation control simulation. He has enjoyed an illustrious career in the military and aerospace industry, having been President of Raytheon Canada and Vice-President of Bombardier and of Oerlikon Aerospace.

**Mr. Stephane Bertrand (Montreal, Quebec), Director:** Stephane Bertrand assumed the role of Chief Executive Officer for the World Energy Congress - Montreal 2010 in November 2007. Between 2003 and 2007, Mr. Bertrand was the Chief of Staff of the Premier of Quebec. His professional responsibilities included close involvement in the development of Quebec's budget and government policies. Prior to his role as Chief of Staff, Mr. Bertrand was an executive with Gaz Metro Inc.

**Mr. Richard Boudreault, M.Eng, MBA, Adm.A (St.-Laurent, Quebec), Orbite Director and President:** Richard Boudreault has been President of Orbite since 2007. He has an impressive list of accomplishments with start-up and growth companies in the new materials sector. He has a Master of Engineering degree from prestigious Cornell University in the United States, and an MBA from Universite de Sherbrooke. Over the years he has worked in technology-related materials positions for numerous companies, such as SOFINOV (a subsidiary of the Caisse de depot et placement du Quebec), Oerlikon Aerospace, and the Canadian Space Agency. Mr. Boudreault sits on the boards of ACL and Mech-Tronix Corp.

**Mr. Charles Chevette MBA (Montreal, Quebec), Director:** Charles Chevette is a lawyer and member of the Quebec Bar. He also has an MBA from the University of Ottawa. Mr. Chevette is an Associate of McMillan SENCRL. Over the years, he has worked for numerous corporate financings, mergers-acquisitions, and transfers of technology, acting for private companies, institutional investors, and university entities. More specifically, he has been involved in several industrial-technology enhancement projects. He is the son of an ex-minister in charge of the Ministry of Natural Resources in Quebec.

**Dr. Toby Gilsig (Montreal, Quebec), Director:** Dr. Gilsig has a degree in electrical engineering from McGill University and a doctorate from the Imperial College of the University of London, where he received an Athlone fellowship. He is a member of the Quebec Order of Engineers, a senior member of IEEE, and a Fellow of the Canadian Academy of Engineering, in addition to having received the Manning Award for Innovation in 1995. Dr. Gilsig is consulted regularly on the subject of technological products and enterprise strategies as part of the activities of JED International Inc., the company he founded in 1996. Previously, he was CEO of M3i Systems Inc., which he co-founded in December 1990. Before co-founding M3i, Dr. Gilsig held a number of management posts at Hydro-Quebec, including Vice-President of Research and Director of the Institut de Recherche d'Hydro-Quebec.

**Mr. Pierre Meunier (Montreal, Quebec), Director:** Pierre Meunier, a lawyer called to Bar in 1967, is an Associate and Strategic Consultant at Fasken Martineau S.E.N.C.R.L., s.r.l. He joined the firm in 1989 after having filled several important posts in the Government of Quebec. In particular, he was Vice-President and founder of the Commission des services juridiques, Director of the Centre communautaire d'aide juridique de Montreal, President of the Office de la protection du consommateur, acting Deputy Minister for the Ministry of Housing and Consumer Protection, and acting Deputy Minister for the Ministère de l'Environnement. Mr. Meunier is Chairman of the Board of Directors of the Fondation des Museums nature de Montreal, member of the Board of Directors of the Institut de recherche en biologie vegetale (IRBV), part of the Universite de Montreal, and member of the Board of Directors and Treasurer of Editions Protegez-Vous.

**Mr. Christian Van Houtte (Montreal, Quebec), Director:** Christian Van Houtte was until recently the President and Chief Executive Officer of the Aluminum Association of Canada, which represents Canadian aluminum producers, a position which he held for 18 years. He previously held various executive positions in the aluminum industry, including that of Senior Vice-President of the Becancour Smelter (ABI) facility. He has also held senior management positions for a number of major organizations, including Canadair, the Cliché Commission, Northern Telecom, and the Societe de developpement de la Baie James.



## APPENDIX 2: FINANCIALS

Figure 13: Income Statement

ORT/A - Income Statement												
December year end (C\$ 000)	2009	Q1/10	Q2/10	Q3/10	Q4/10E	2010E	Q1/11E	Q2/11E	Q3/11E	Q4/11E	2011E	2012E
Sales	0	0	0	0	0	0	0	0	0	0	0	105,000
Cost of goods sold	0	0	0	0	0	0	0	0	0	0	0	(420)
Gross profit	0	0	0	0	0	0	0	0	0	0	0	104,580
Salaries, benefits, marketing, selling	0	0	0	0	0	0	0	0	0	0	0	0
General & Administrative	(371)	(159)	(194)	(774)	(774)	(1,902)	(774)	(774)	(774)	(774)	(3,098)	(3,098)
Professional fees	(313)	0	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0	0	0
Research & Development	(175)	(153)	(119)	(421)	(421)	(1,114)	(316)	(316)	(316)	(316)	(1,264)	(47)
EBITDA	(858)	(312)	(312)	(1,196)	(1,196)	(3,016)	(1,091)	(1,091)	(1,091)	(1,091)	(4,362)	101,435
Amortization	0	0	0	0	0	0	(46)	(42)	(2,630)	(7,620)	(10,338)	(10,667)
Operating income	(858)	(312)	(312)	(1,196)	(1,196)	(3,016)	(1,136)	(1,133)	(3,720)	(8,711)	(14,700)	90,768
Interest on short-term borrowing	17	2	3	6	30	40	0	0	(3,000)	(3,000)	(12,000)	(11,200)
Earnings before taxes	(841)	(311)	(309)	(1,190)	(1,166)	(2,976)	(1,136)	(1,133)	(6,720)	(11,711)	(26,700)	79,568
Income taxes	0	0	0	0	0	0	307	306	1,814	3,162	5,589	(21,483)
Minority interest	0	0	0	0	0	0	0	0	0	0	0	0
Net and comprehensive income	(648)	(311)	(309)	(1,190)	(1,166)	(2,976)	(829)	(827)	(4,906)	(8,549)	(21,111)	58,085
Dividends												
EPS - basic	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)	(0.04)	(0.01)	(0.01)	(0.04)	(0.06)	(0.11)	0.39
EPS - fully diluted (FD)	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)	(0.03)	(0.00)	(0.00)	(0.03)	(0.05)	(0.08)	0.30
EPS - exci. unusual items (FD)	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)	(0.03)	(0.00)	(0.00)	(0.03)	(0.05)	(0.08)	0.30
CFPS - basic	(\$0.01)	(\$0.00)	(\$0.00)	(\$0.01)	(\$0.01)	(\$0.03)	(\$0.01)	(\$0.01)	(\$0.02)	(\$0.01)	(\$0.04)	\$0.46
CFPS - fully diluted	(\$0.01)	(\$0.00)	(\$0.00)	(\$0.01)	(\$0.00)	(\$0.03)	(\$0.01)	(\$0.01)	(\$0.01)	(\$0.01)	(\$0.03)	\$0.36
FCFPS - basic	(\$0.02)	(\$0.01)	(\$0.02)	(\$0.01)	(\$0.01)	(\$0.05)	(\$0.01)	(\$0.01)	(\$0.55)	(\$0.52)	(\$1.12)	(\$1.41)
FCFPS - fully diluted	(\$0.02)	(\$0.01)	(\$0.02)	(\$0.01)	(\$0.01)	(\$0.04)	(\$0.01)	(\$0.01)	(\$0.42)	(\$0.40)	(\$0.85)	(\$1.09)
Shares outstanding - basic	61,384	62,683	69,183	78,633	103,316	78,454	128,000	128,000	134,333	140,667	132,750	147,333
Shares outstanding - fully diluted	61,384	62,683	69,183	78,633	124,816	83,829	171,000	171,000	177,333	183,667	175,750	190,333

Source: Company reports, Mackie Research Capital estimates

Figure 14: Balance Sheet

ORT/A - Balance Sheet		2009	Q1/10	Q2/10	Q3/10	Q4/10E	2010E	Q1/11E	Q2/11E	Q3/11E	Q4/11E	2011E	2012E
<b>December year end (C\$ 000)</b>													
<b>Assets</b>													
Current assets													
Cash and cash equivalents	203	79	360	116	7,769	7,769	7,769	6,985	6,200	(0)	(0)	(0)	(0)
Short-term investments	252	403	2,006	1,568	1,568	1,568	1,568	1,568	1,568	1,568	1,568	1,568	1,568
Accounts receivable	45	101	113	180	0	0	0	0	0	0	0	0	0
Prepaid and other assets	48	21	39	52	0	0	0	0	0	0	0	0	0
Inventory	0	0	0	0	0	0	0	0	0	0	0	0	0
Future income tax asset	36	36	36	22	22	22	22	22	22	22	22	22	22
	584	640	2,554	1,939	9,359	9,359	9,359	8,575	7,791	1,590	1,590	1,590	1,590
Mining properties	43	43	43	45	45	45	45	45	45	45	45	45	45
Exploration funds	159	154	45	295	295	295	295	295	295	295	295	295	295
Equipment, net amortization, capital assets	281	342	330	631	631	631	631	585	543	69,580	133,626	133,626	399,626
Intangible assets (patents)	66	79	67	72	72	72	72	72	72	72	72	72	72
Other	1,450	1,456	1,564	1,879	1,879	1,879	1,879	1,879	1,879	1,879	1,879	1,879	1,879
	2,584	2,712	4,603	4,860	12,280	12,280	12,280	11,451	10,624	73,461	137,507	137,507	403,507
<b>Liabilities and Shareholders' Equity</b>													
Current liabilities													
Short-term loans	0	0	0	0	0	0	0	0	0	36,076	77,004	77,004	231,585
Accounts payable and accrued liabilities	183	92	109	93	0	0	0	0	0	0	0	0	0
Deferred grant	0	0	500	498	498	498	498	498	498	498	498	498	498
Due to related parties	0	0	0	0	0	0	0	0	0	0	0	0	0
Income taxes payable	0	0	0	0	0	0	0	0	0	0	0	0	0
Current portion of LT Debt	0	0	0	0	0	0	0	0	0	0	0	0	0
Other (i.e. current portion of capital leases)	0	0	0	0	0	0	0	0	0	0	0	0	0
	183	92	609	590	498	498	498	498	498	36,573	77,502	77,502	232,083
<b>Other</b>													
LT debt/obligation under capital leases	472	973	971	968	968	968	968	968	968	968	968	968	968
Other	0	0	0	0	0	0	0	0	0	0	0	0	0
	655	1,065	1,579	1,559	1,466	1,466	1,466	1,466	1,466	37,542	78,470	78,470	233,051
Non-controlling interest	0	0	0	0	0	0	0	0	0	0	0	0	0
Shareholders' equity													
Share capital													
Contributed surplus and warrants	1,050	1,050	1,090	2,195	10,875	10,875	10,875	10,875	10,875	10,875	10,875	10,875	10,875
Capital stock	13,391	13,391	15,081	15,509	15,509	15,509	15,509	15,509	15,509	47,176	78,842	78,842	132,177
Accumulated other comprehensive income	29	58	58	58	58	58	58	58	58	58	58	58	58
Retained earnings (deficit)	(12,541)	(12,852)	(13,205)	(14,461)	(15,627)	(15,627)	(15,627)	(16,456)	(17,283)	(22,189)	(30,738)	(30,738)	(30,738)
	1,928	1,647	3,024	3,301	10,815	10,815	10,815	9,985	9,158	35,919	59,037	59,037	170,456
	2,584	2,712	4,603	4,860	12,280	12,280	12,280	11,451	10,624	73,461	137,507	137,507	403,507

Source: Company reports, Mackie Research Capital estimates



Figure 15: Cash-Flow Statement

<b>ORT/A- Cash-Flow Statement</b>		<b>2009</b>	<b>Q1/10</b>	<b>Q2/10</b>	<b>Q3/10</b>	<b>Q4/10E</b>	<b>2010E</b>	<b>Q1/11E</b>	<b>Q2/11E</b>	<b>Q3/11E</b>	<b>Q4/11E</b>	<b>2011E</b>	<b>2012E</b>
December year end (C\$ 000)													
Cash provided by (used in):													
Operating activities		(648)	(311)	(309)	(1,190)	(1,166)	(2,976)	(829)	(827)	(4,906)	(8,549)	(15,111)	58,085
Net income		0	9	0	15	0	25	46	42	2,630	7,620	10,338	10,667
Items not involving cash:		(193)	0	0	0	0	0	0	0	0	0	0	0
Amortization		65	0	0	498	0	498	0	0	0	0	0	0
Gain on disposal of fixed assets		(775)	(301)	(309)	(540)	(1,166)	(2,316)	(784)	(785)	(2,276)	(929)	(4,773)	68,751
Future income tax		60	(119)	(1,117)	(82)	139	(1,179)	0	0	0	0	0	0
Other		(715)	(420)	(1,426)	(622)	(1,027)	(3,495)	(784)	(785)	(2,276)	(929)	(4,773)	68,751
Stock-based compensation													
Changes in non-cash operating working capital													
<b>Cash from operations after W/C</b>													
<b>Financing activities</b>													
Net advances from (repayments to) related party		0	0	0	0	0	0	0	0	0	0	0	0
Proceeds (repayment) of ST and LT borrowings		200	0	40	770	8,680	9,490	0	0	36,076	40,929	77,004	154,581
Issuance of common shares		0	0	0	110	0	0	0	0	31,667	31,667	63,333	53,334
Proceeds from exercise of stock options/warrants		(3)	0	0	(51)	0	0	0	0	0	0	0	0
Financing costs		500	530	(2)	(2)	0	525	0	0	0	0	0	0
Cash acquired on reverse takeover		0	0	0	0	0	0	0	0	0	0	0	0
Long-term debt/payments of capital lease obligations		697	530	38	827	8,680	10,015	0	0	67,742	72,595	140,338	207,915
Minority interest													
<b>Net funds from financing</b>													
<b>Investing activities</b>													
Mining properties		0	0	0	(2)	0	(2)	0	0	0	0	0	0
Purchase of property, plant, equipment		(281)	(70)	120	(316)	0	(266)	0	0	(71,667)	(71,667)	(143,333)	(276,667)
Additions to intangible assets/purchase project development costs		(50)	(13)	(13)	(6)	0	0	0	0	0	0	0	0
Other (non-controlling interest - capital contribution)		506	(152)	(108)	(126)	0	(386)	0	0	0	0	0	0
<b>Net funds from investing</b>		175	(234)	(1)	(449)	0	(654)	0	0	(71,667)	(71,667)	(143,333)	(276,667)
Effect of exchange rate changes on cash and cash equivalents		0	0	0	0	0	0	0	0	0	0	0	0
Net Cash Flow		157	(124)	(1,389)	(244)	7,653	5,866	(784)	(785)	(6,200)	0	(7,769)	0
Net Cash Flow excluding Bank Debt		157	(124)	(1,389)	(244)	7,653	5,866	(784)	(785)	(42,276)	(40,929)	(7,769)	0
Free Cash Flow		(996)	(654)	(1,427)	(1,071)	(1,027)	(3,761)	(784)	(785)	(73,943)	(72,595)	(148,106)	(207,915)
Cash, beginning of period		46	203	79	360	116	203	7,769	6,985	6,200	(0)	7,769	(0)
Cash, end of period		203	79	(1,311)	116	7,769	6,069	6,985	6,200	0	0	0	0
<b>Per share cash flow:</b>													
CFO (pre-wkg cap changes)		(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.03)	(0.00)	(0.00)	(0.01)	(0.01)	(0.03)	0.36
CFO (post-wkg cap changes)		(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.04)	(0.00)	(0.00)	(0.01)	(0.01)	(0.03)	0.36
Free Cash Flow		(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.04)	(0.00)	(0.00)	(0.02)	(0.02)	(0.04)	(1.09)
Free Cash Flow ex. Bank Debt		0.00	(0.00)	(0.02)	(0.00)	0.06	0.07	(0.00)	(0.00)	(0.00)	(0.22)	(0.04)	0.00
Net Cash Flow		0.00	(0.00)	(0.02)	(0.00)	0.06	0.07	(0.00)	(0.00)	(0.03)	0.00	(0.04)	0.00

Source: Company reports, Mackie Research Capital estimates

Figure 16: ORT/A - Smelter Grade Alumina DCF Model Summary

EXPLORATION ORBITE VSPA INC. - SGA DCF Summary										
Year	2013	2014	2015	2016	2017	2037	2038	2039	2040	TOTALS
Number of Years in Operation	1	2	3	4	5	25	26	27	28	
<b>OPERATION</b>										
Production (tpd)	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	84,000
Total Production per year (tonnes)	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	900,000	25,200,000
By Product Revenue	-	-	-	-	-	-	-	-	-	-
<b>REVENUE (All financial data in C\$ 000)</b>										
Revenue from Base Sales	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$360,000	\$10,080,000
<b>TOTAL OPERATING COSTS</b>										
Total Operating Costs	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$4,183,200)
<b>OPERATING EXPENSES BREAK-DOWN</b>										
COGS	(\$122,400)	(\$122,400)	(\$122,400)	(\$122,400)	(\$122,400)	(\$122,400)	(\$122,400)	(\$122,400)	(\$122,400)	(\$3,427,200)
SG&A	(\$18,000)	(\$18,000)	(\$18,000)	(\$18,000)	(\$18,000)	(\$18,000)	(\$18,000)	(\$18,000)	(\$18,000)	(\$504,000)
R&D	(\$9,000)	(\$9,000)	(\$9,000)	(\$9,000)	(\$9,000)	(\$9,000)	(\$9,000)	(\$9,000)	(\$9,000)	(\$252,000)
Sub-Total Costs	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$149,400)	(\$4,183,200)
<b>ESTIMATED INCOME</b>										
Operating Income	\$210,600	\$210,600	\$210,600	\$210,600	\$210,600	\$210,600	\$210,600	\$210,600	\$210,600	\$5,896,800
Book Depreciation/Amortization	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$300,000)
Interest Expense	(\$10,400)	(\$9,600)	(\$8,800)	(\$8,000)	(\$7,200)	\$0	\$0	\$0	\$0	(\$96,000)
Pre-Tax Book Income	\$190,200	\$191,000	\$191,800	\$192,600	\$193,400	\$200,600	\$200,600	\$200,600	\$190,600	\$5,500,800
Income Tax @ 30% Blended	(\$57,060)	(\$57,300)	(\$57,540)	(\$57,780)	(\$58,020)	(\$60,180)	(\$60,180)	(\$60,180)	(\$57,180)	(\$1,650,240)
Net Book Income	\$133,140	\$133,700	\$134,260	\$134,820	\$135,380	\$140,420	\$140,420	\$140,420	\$133,420	\$3,850,560
<b>INCOME TAX CALCULATION</b>										
Pre-Tax Book Income	\$190,200	\$191,000	\$191,800	\$192,600	\$193,400	\$200,600	\$200,600	\$200,600	\$190,600	\$5,500,800
Add Book Depreciation/Amortization	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$20,000	\$300,000
Less Tax Depreciation/Amortization	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$10,000)	(\$20,000)	(\$300,000)
Taxable Income	\$190,200	\$191,000	\$191,800	\$192,600	\$193,400	\$200,600	\$200,600	\$200,600	\$190,600	\$5,500,800
Income Taxes Owed	(\$57,060)	(\$57,300)	(\$57,540)	(\$57,780)	(\$58,020)	(\$60,180)	(\$60,180)	(\$60,180)	(\$57,180)	(\$2,090,304)
<b>After-Tax Cash Flow</b>	<b>\$127,140</b>	<b>\$127,700</b>	<b>\$128,260</b>	<b>\$128,820</b>	<b>\$129,380</b>	<b>\$150,420</b>	<b>\$150,420</b>	<b>\$150,420</b>	<b>\$153,420</b>	<b>\$3,900,600</b>
<b>After-Tax IRR 20%</b>										
Capex										(\$300,000)
Equity @ 20%										\$60,000
Loan @ 80%										(\$240,000)
Interest										5%
Tax Expense										(\$16,000)
Maintenance Capex										(\$8,800)
Cash Flow to Equity Investors										(\$57,540)
										(\$10,000)
										\$117,140
<b>NPV 15%</b>										<b>\$500,624</b>
Discount rate										15%
Number of shares o/s (000)										194,334
Value per share										\$2.58

Source: Company reports, Mackie Research Capital estimates

Figure 17: ORT/A - High-Purity Alumina DCF Model Summary

Year	2012	2013	2014	2015	2037	2038	2039	2040	TOTALS
Number of Years in Operation	1	2	3	4	26	27	28	29	
<b>OPERATION</b>									
Production (tpd)	1.75	5	5	5	5	5	5	5	142
Total Production per year (tonnes)	525	1,500	1,500	1,500	1,500	1,500	1,500	1,500	42,525
<b>REVENUE (All financial data in C\$ 000)</b>									
Revenue from Base Sales	\$105,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$8,505,000
<b>TOTAL OPERATING COSTS</b>									
Sub-total Operating Expenses	(\$525)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$42,525)
<b>OPERATING EXPENSES</b>									
COGS	(\$420)	(\$1,200)	(\$1,200)	(\$1,200)	(\$1,200)	(\$1,200)	(\$1,200)	(\$1,200)	(\$34,020)
SG&A	(\$58)	(\$165)	(\$165)	(\$165)	(\$165)	(\$165)	(\$165)	(\$165)	(\$4,678)
R&D	(\$47)	(\$135)	(\$135)	(\$135)	(\$135)	(\$135)	(\$135)	(\$135)	(\$3,827)
Sub-Total Costs	(\$525)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$1,500)	(\$42,525)
<b>ESTIMATED INCOME</b>									
Operating Income	\$104,475	\$298,500	\$298,500	\$298,500	\$298,500	\$298,500	\$298,500	\$298,500	\$8,462,475
Book Depreciation/Amortization	(\$667)	(\$667)	(\$667)	(\$667)	(\$667)	(\$667)	(\$667)	(\$1,333)	(\$20,000)
Interest Expense	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Pre-Tax Book Income	\$103,808	\$297,833	\$297,833	\$297,833	\$297,833	\$297,833	\$297,833	\$297,167	\$8,442,475
Income Tax @ 30% Blended	(\$31,143)	(\$89,350)	(\$89,350)	(\$89,350)	(\$89,350)	(\$89,350)	(\$89,350)	(\$89,150)	(\$2,532,743)
Net Book Income	\$72,666	\$208,483	\$208,483	\$208,483	\$208,483	\$208,483	\$208,483	\$208,017	\$5,909,733
<b>INCOME TAX CALCULATION</b>									
Pre-Tax Book Income	\$103,808	\$297,833	\$297,833	\$297,833	\$297,833	\$297,833	\$297,833	\$297,167	\$8,442,475
Add Book Depreciation/Amortization	\$667	\$667	\$667	\$667	\$667	\$667	\$667	\$1,333	\$20,000
Less Tax Depreciation/Amortization	(\$667)	(\$667)	(\$667)	(\$667)	(\$667)	(\$667)	(\$667)	(\$1,333)	(\$20,000)
Taxable Income	\$103,808	\$297,833	\$297,833	\$297,833	\$297,833	\$297,833	\$297,833	\$297,167	\$8,442,475
Income Taxes Owed	(\$31,143)	(\$89,350)	(\$89,350)	(\$89,350)	(\$89,350)	(\$89,350)	(\$89,350)	(\$89,150)	(\$3,208,141)
<b>After-Tax Cash Flow</b>	\$73,333	\$209,150	\$209,150	\$209,150	\$209,150	\$209,150	\$209,150	\$209,350	\$5,909,733
<b>After-Tax IRR 26%</b>									
Capex	-\$20,000								
Equity @ 20%	\$20,000								
Loan @ 80%	\$0								
Interest	5%								
Tax Expense									
Maintenance Capex									
Cash Flow to Equity Investors									
<b>NPV 15% \$1,014,355</b>									
Discount rate	15%								
Number of shares o/s (000)	194,334								
Value per share	\$5.22								

Source: Company reports, Mackie Research Capital estimates

**RELEVANT DISCLOSURES:**

- None applicable.

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Member CIPF



## CORPORATE INFORMATION

### TORONTO

199 Bay Street, Suite 4500  
Commerce Court West, Box 368  
Toronto, ON M5L 1G2  
**T.** (416) 860-7600  
**F.** (416) 860-7671

### MONTREAL

4 Place Ville-Marie  
Bureau 100  
Montréal, QC H3B 2E7  
**T.** (514) 399-1500  
**F.** (514) 399-1540

### REGINA

2400 College Avenue  
Suite 501  
Regina, SK S4P 1C8  
**T.** (306) 566-7550  
**F.** (306) 565-3718

### CALGARY

335 - 8th Ave SW, Suite 1550  
Royal Bank Building,  
Calgary, AB T2P 1C9  
**T.** (403) 218-6375  
**F.** (403) 218-6376

### ST. ALBERT

28 Mission Avenue  
Suite 201  
St. Albert, AB T8N 1H4  
**T.** (780) 460-6460  
**F.** (780) 460-6461

### VANCOUVER

1055 Dunsmuir Street, Suite 564  
Box 49356, Four Bentall Centre  
Vancouver, BC V7X 1L4  
**T.** (604) 662-1800  
**F.** (604) 662-1850