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RESSOURCES D'ARIANNE INC.

***GREENHOUSE GAS ACCOUNTING REPORT
2012***

Accounting completed on December 31, 2012

By Guylaine Blackburn

Report by Élise Girard-Gagnon and Nadège Tollari

This report is a summary of our efforts to compile greenhouse gas (GHG) emissions resulting from the Company's exploration work **during the year 2012**. The report also provides a summary of the offset measures implemented to date.

○ **Accounting**

GHG emissions were accounted by a member of our staff (Guylaine Blackburn with the assistance of Daniel Boulianne) and not by a third party. The accounting was limited to whatever invoices were available and whatever information could be reliably confirmed (estimated consumption of certain vehicles for example). Arianne Resources activities are responsible for the emission of **962 tonnes of CO₂ equivalent for the year 2012 (Table 1)**. The highest emissions are reported on the Lac à Paul project, where logging activities took place, which produce the highest amount of emissions.

Table 1: Greenhouse gas emissions associated with each of the Company's activities during the year 2012 (in metric tonnes)

	Total	Administration and field transportation	Logging	Drilling	Excavation & Heavy equipment	Other
Lac à Paul	920.75	146.52	659.64	57.34	51.37	5.88
<i>1st quarter</i>	39.91	10.72		2.55	26.64	
<i>2nd quarter</i>	701.14	30.86	659.64	0.33	9.63	0.68
<i>3rd quarter</i>	78.58	48.06		21.82	7.93	0.77
<i>4th quarter</i>	101.12	56.88		32.64	7.17	4.43
Mirepoix	2.81	-	-	-	-	2.81
<i>1st quarter</i>	2.81	-	-	-	-	2.81
R-14	0.91	0.91	-	-	-	-
<i>2nd quarter</i>	0.91	0.91	-	-	-	-
Representation	37.96	0.48	-	-	-	37.48
<i>1st quarter</i>	15.82	0.48	-	-	-	15.34
<i>2nd quarter</i>	3.51	-	-	-	-	3.51
<i>3rd quarter</i>	9.35	-	-	-	-	9.35
<i>4th quarter</i>	9.28	-	-	-	-	9.28
Total (metric tonnes)	962.43	147.91	659.64	57.34	51.37	46.17
Percentages (%)	1	15%	69%	6%	5%	5%

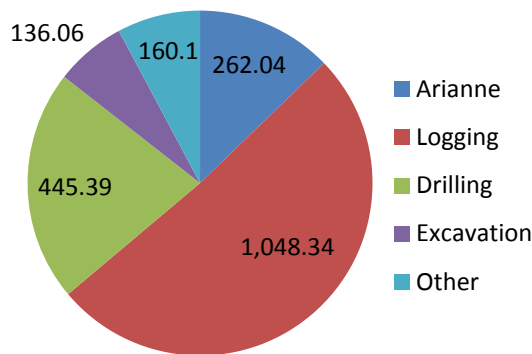
Since its establishment, Arianne Resources activities are responsible for the emission of **2,052 tonnes of CO₂ equivalent (Table 2)**. The activity that produce highest emissions, logging, is responsible for **over 50% of the total GHG emissions (Figure 1)**.

Table 2: Greenhouse gas emissions associated with each of the Company's activities, since 1999 (tonnes of CO₂ equivalent).

	Total	Arianne	Logging	Drilling	Excavation	Other
1999-2010	867.21	52.86	388.70	308.69	44.59	72.37
2011	222.29	61.27	0.00	79.36	40.10	41.56
2012	962.43	147.91	659.64	57.34	51.37	46.17
Total	2,051.93	262.04	1,048.34	445.39	136.06	160.10
Percentage	100 %	13 %	51 %	22 %	7 %	8 %

Figure 1: Greenhouse gas emissions associated with each of the Company's activities, since 1999 (tonnes of CO₂ equivalent).

GHG emissions



o Offsetting

- Amounts to be offset

The rates proposed by Pierre-Luc Dessureault from the Chair on Eco-advising at: <http://carborealeboréal.uqac.ca> were used to establish financial equivalents. All amounts are in Canadian dollars unless otherwise indicated. Carbone Boréal offers rates in the mid-range : \$28/ton GHG.

Activities carried out by Arianne Resources are responsible for the emission of **962 tonnes of CO₂ equivalent during the year 2012**. This means that to offset our total CO₂ emissions for the quarter would require **planting 6,875 trees or investing \$26,948.04**. This solution is the simplest and most widely used to offset GHG emissions and become carbon neutral.

- Proposed offset measures

Of the three offset measures proposed, which are purchasing carbon credits, tree planting or investing in a research and innovation project, Arianne Resources decided to prioritize the third option since the beginning of its offset program. Indeed, the company collaborates on **two research project aiming to limit the environmental impact of our product (phosphorus concentrate) during its life cycle** : the Global TraPs project and a Laval University research project.

- *Offset measures implemented during the year 2012*

o *Global TraPs project*

During the **first quarter**, within the scope of the Global TraPs project, Nadège Tollari and Bernard Lapointe attended a conference in Morocco, from March 15 to 19, 2012. During the conference, Arianne Resources and its Lac à Paul project were designated to become a case study. The environmental and social practices of the Company will be documented and published online on the Global TraPs platform. All the material needed to document the case study will be provided by Arianne Resources. An amount of **\$3,490.00** was invested during this conference.

o *Research Project on mycorrhizae*

Arianne Resources collaborates for over a year to a research project led by a Laval University team. This project aims to develop development of "green" fertilizing methods, with a lower cost-in-use (1/3) and a manufacturing process with a much lighter environmental footprint. Potential applications include forestry in northern settings and rehabilitation of mine sites and hydroelectric structures. In 2011, the company provided rock samples, allowing them to carry out laboratory tests and appear to yield positive results. The fungus under study successfully used the Lac à Paul apatite concentrate to provide nutrients to the selected vegetable (carrot) with no prior chemical treatment. Following these very promising initial results, Arianne received a proposal from the research team led by Dr. André Fortin to fund a Ph.D. study. This project would receive financing from three different sources: Private, NSERC, FQRNT. Given the possible benefit of such a research project, the company decided during the **second quarter** to fund a research scholarship that will give added value to the Lac à Paul phosphate concentrate (apatite).

An association between plant roots and fungi, which has been observed in 400-million-year-old plant fossils, develops a fine filament (mycelium) in the soil that improves the plant's ability to absorb minerals, including phosphorus, tenfold. This applies to agricultural, forest and wild plants. To date, the principles and techniques used in agriculture and forestry have not really taken this fact into account. The objective of this research is to use the apatite concentrate and mycorrhizae to help restore vegetation on sites disturbed by major work such as mining operations. The results will potentially enable Arianne Resources to offer "organic" fertilizer, that is, non-acidified concentrate for agriculture, forestry and the environment.

Arianne Resources will invest **\$9,000** a year for 3 years in this project.

o *Carbone Boréal*

During the **third quarter**, among travel attributable to representation of Arianne Resources, one plane trip, refunded to a person outside the Company, included a carbon offset. This trip, from Vancouver to Saguenay, generated 1.33 metric tonnes of CO₂ equivalent. The offset was made through organization Carbone Boréal.

- *Assessment of offsets and emissions*

The Company's GHG emissions in tonnes of CO₂ equivalent since 1999 amount to a total of 2,052 tonnes. This represents an amount of \$54,376 to be invested in offset measures to become carbon neutral. To date, Arianne Resources has invested a total of \$21,948 in research projects. Table 2 provides a financial summary of these investments and the amounts required in the future.

Table 2: Summary of offset measures implemented by Arianne Resources as of December 31, 2012

Emissions	
1999-2010	867
2011	222
2012	962
Total (tonnes CO₂ eq.)	2051
Financial equivalents	
Price/metric ton CO ₂ (\$/ton)	28
Total amount to offset (\$)	57 428 \$
Amounts invested	
Global TraPs 2011	5181
UQAC Eco-advising Chair	4240
Global TraPs 2012	3490
Research scholarship	9000
Carbone Boréal 2012	37
Total amounts invested	21 948 \$
Amount left to be offset	35 480 \$

Références:

<http://carboneboreal.uqac.ca/>

<http://www.arianne-inc.com/>

<http://www.carbonpositive.net/>