

annual report

# 2014



Lakeland Industry & Community Association

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# INTRODUCTION to lica

Lakeland Industry and Community Association (LICA) is a community based synergy group working together to support a healthy and sustainable environment. We are a multi-stakeholder partnership between community, industry and government coming together to establish understanding and rapport, share information, and work toward mutually beneficial solutions to local concerns.

Our work is undertaken through our offices in Bonnyville, Alberta, Canada, and we serve an area of east central Alberta encompassing approximately 18,000 square kilometers.

## Our Vision

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Lakeland Industry and Community Association is a balanced partnership actively supporting a sustainable environment.

## Our Mission

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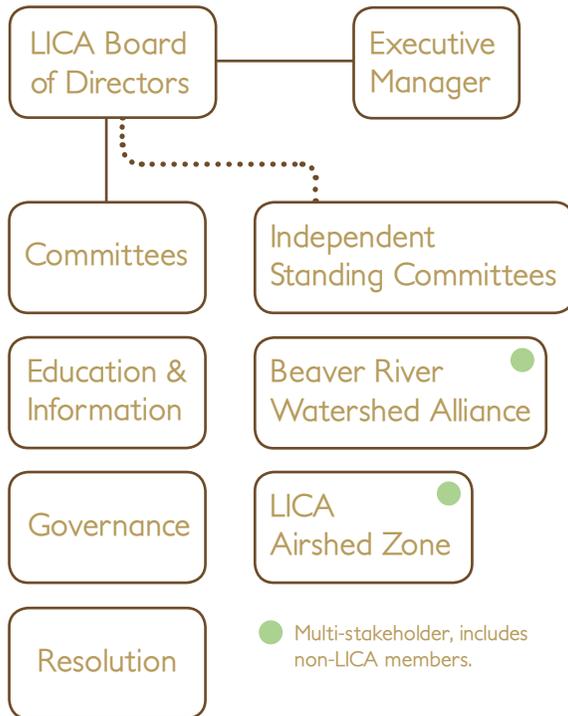
LICA supports the environment by gathering, sharing, and acting on information regarding development in our region.

## Our Values

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- Trust
- Integrity
- Equality
- Honesty
- Respect
- Cooperation
- Participation
- Transparency
- Responsibility
- Accountability
- Supportiveness
- Open-mindedness

# OUR ORGANIZATION



Lakeland Industry and Community Association (LICA) is an incorporated not-for-profit society. We have a Board of twelve Directors, some elected and some appointed, to provide direction and leadership to our organization.

A number of Committees assist with the work of our association including:

- Education and Information Committee which collects and disseminates information, and plans and facilitates outreach activities and special events.
- Governance Committee which develops, monitors and ensures compliance with LICA's policies and bylaws.
- Resolution Committee which facilitates the resolution of concerns and issues related to development in the region.

In addition, LICA has two independent standing committees, both of which have a technical focus:

- LICA Airshed Zone facilitates regional air quality monitoring, and furthers and promotes an understanding of air quality.
- Beaver River Watershed Alliance works to advance and update knowledge of the watershed with a focus on monitoring studies and communication.

The Board employs an Executive Manager, who is responsible for the successful management of LICA according to its Vision, Mission, Values, bylaws, policies, and strategic plan. The Executive Manager is assisted in these duties by several staff.



# geographical AREA

-  LICA Boundary
-  LICA Airshed Zone
-  Beaver River Watershed Alliance

The Lakeland Industry and Community Association (LICA) boundary stretches west to east from approximately Township 55, Range 12, W4M to the Saskatchewan border, north to include the Cold Lake Air Weapons Range and south to Highway 45. The area encompasses just under 18,000 square kilometres.



# CHAIR'S message

We are progressing into our second decade, and I am prouder than ever to be associated with an organization that is such a force for positive action as LICA is. I had the opportunity to participate in a community registration day, and was delighted by the number of people who had heard of LICA, who read last year's annual report, and who wanted to know how to get involved. It tells me that we are on the right track here - that bringing people together to talk to each other and share information is the surest way there is to create understanding and beneficial outcomes.

As you read through this annual report, you'll see the valuable and exciting things LICA has been doing, from the Oil and Gas from Start to Finish presentation series, to the airshed monitoring, to the many projects of the Beaver River watershed. We are fortunate to have volunteers from the community, Aboriginal, industry, and government sectors on our Board and committees - the people who are the heart and soul of LICA, for whom we exist, and without whom we could not function.

The always-growing lending library of resource development, regulatory, and general information at the LICA office is there for your use and enjoyment. Our terrific staff (Charmaine Code, Executive Manager; Jodi Vanasse, Executive Assistant; Charman Alm, Administrative Assistant; and Hong Zhu, Accounting Assistant) have the answers you need when you call or drop by, and if they don't, they'll make sure to connect you with the required information.

Where once the oil and gas company operators in the area considered themselves rivals, they now meet regularly to share information and discuss the best ways to operate for the benefit of all stakeholders in the region. We partner closely with the Energy Resources Conservation Board (ERCB). The many monitoring and research projects undertaken by the LICA Airshed Zone and the Beaver River Watershed Alliance work to the benefit of all landowners and stakeholders in the LICA region, and the cost is carried primarily by our industry members, with additional welcome support from Alberta Environment and Water.

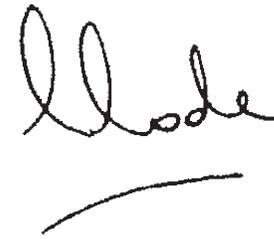
I have been privileged to serve with a strong, committed Board this year: Delano Tolley - Vice-Chair, Kathleen Zellweger - Secretary-Treasurer, Fred Bamber, Wayne Bamber, Shirley Benson, Roxane Bretzlaff, Shawn Brockoff, Keith Chiasson, Robert Deresh, Alan Drew-Brook, Gordon John, Annette Ozirny, Ajaz Quraishi, Harold Ross, Mary Smith, and Kathryn Wiebe. I look forward with great delight to what LICA does next - together, we are accomplishing so much.



Iris English  
LICA Board Chair



# executive manager's message



Charmaine Code  
Executive Manager

Each year, preparation of the Annual Report on behalf of Lakeland Industry and Community Association (LICA) and our many members, provides an opportunity to reflect on the year just past and contemplate our many successes.

LICA has completed eleven years of operation, and evolved into a leader in our region. Of course we have challenges, as do all organizations, but each challenge provides opportunity for us to achieve consensus within our Vision and Mission, making us stronger in the process.

The commitment and teamwork of each of our stakeholders is an inspiration for us to continue with our work of supporting a sustainable environment by gathering, sharing, and acting on information regarding development in our region. The year was therefore full of activities, some of which we are featuring in the following pages. Please take a few minutes to see what we've accomplished and what we plan for the future.

At this time, I also want to extend a big thank you to our Board of Directors, Committees, staff, and contractors, for their outstanding contributions and support, reinforcing our strength. Thank you in particular to my staff: Jodi Vanasse, Charman Alm, Hong Zhu, and Gail Nielsen, for their energy and effort on a daily basis. We are very fortunate to have such fine people to work with.

We are now embarking on another great year at LICA, recognizing what



we are good at while venturing into new territory as we continue to do it bigger and better. My commitment is to continue celebrating our success, reflecting on the past, and thoughtfully treading on our future path. To our current members – thank you for your dedication and involvement. To our new members who will join us this year – welcome, and congratulations on helping to enhance the lives of those in the Lakeland.

If you live, work, or operate in the Cold Lake / Bonnyville / St. Paul area, you have been or will be affected by or involved in resource development such as oil and gas, forestry, or sand and gravel. Resource development is a complex issue, involving access, rights, compensation, transportation, health, and community relations.

As a synergy group, LICA - a not-for-profit association of community members, local and provincial government, and oil and gas and other industries - works to build understanding, respect, and relationships; share information; and arrive at mutually beneficial solutions to local concerns. People have the chance to talk - and listen - one-on-one. Confrontation - eating up everyone's time, energy, and resources - becomes a last resort.

Whether you are a community, industry, or government member, LICA can offer you:

- The chance to bring forward your concerns and questions
- A way to build understanding, respect, and trust
- The ability to sort out concerns before they become problems
- An established process for issue resolution
- Freedom to bring information to the table
- The opportunity to support and contribute to responsible resource development
- The power to influence the type of things that are monitored, or influence targeted monitoring of air, water, and soil, should there be concerns
- Access to the technical expertise that industry, and their employees, bring to address issues
- Better communication with the sectors that affect your life and business
- A broader perspective, and the chance to understand others' points of view
- A forum for dialogue and discussion
- Shared information, knowledge, and answers
- New contacts, relationships, and networks
- An avenue of communication between communities, government, and industries
- Accurate, science-based information
- Freedom to speak an opposing view
- Awareness of emerging issues
- Regular contact with individuals and organizations in your local area
- The chance to learn from others' experiences
- Opportunity to engage in airshed and watershed activities
- Involvement in activities and decisions with legislative and regulatory impact



WHY JOIN  
lica?

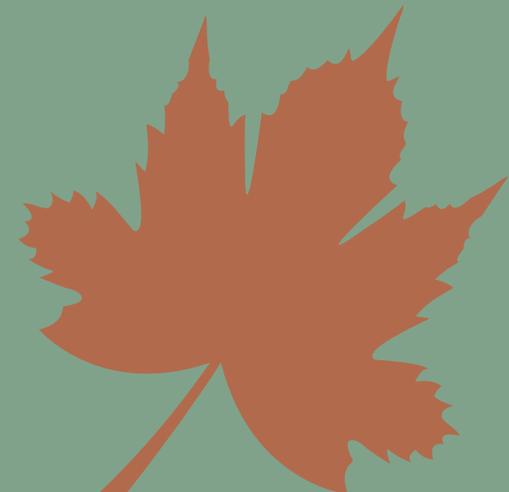
# BOARD of directors



LICA Table Officers

(L to R): Kathleen Zellweger (Secretary-Treasurer),  
Delano Tolley (Vice-Chairman), Iris English (Chair).

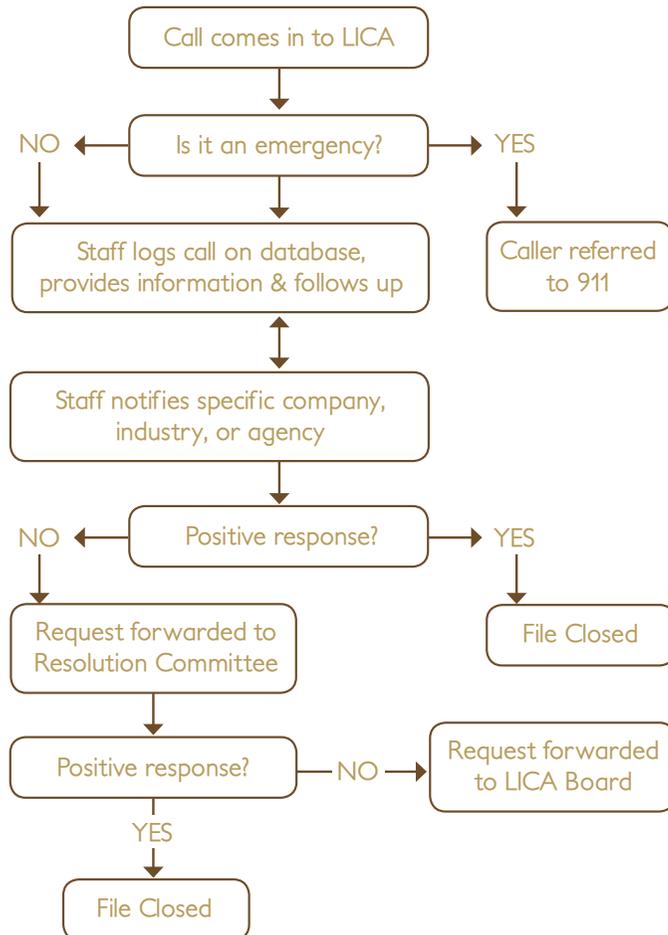
Back row (L to R): Alan Drew-Brook (Alt. Director), Fred Bamber (Director), Harold Ross (Director), Robert Deresh (Director), Delano Tolley (Vice-Chairman), and Wayne Bamber (Director). Front row (L to R): Iris English (Chair), Mary Smith (Alt. Director), Ajaz Quraishi (Alt. Director), and Kathleen Zellweger (Secretary-Treasurer). Missing: Directors Shirley Benson, Keith Chiasson, Gordon John, Annette Ozirny, and Kathryn Wiebe; and Alternate Directors Roxane Bretzlaff and Shawn Brockhoff.



# COMMITTEES

## governance+resolution

### LICA's Issue Resolution Process



### Governance Committee

The Governance Committee's role is to ensure that the requirements of the Alberta Societies Act, under which LICA is incorporated, are met, and that the Bylaws and Policies are clear, easy to follow, and in accord with each other. As a standing committee of LICA, the Governance Committee works at the direction of the Board to review, revise, develop, and monitor Policies and Bylaws, and to develop and deliver training in the consensus model of decision making used by LICA. Most of the work is done by email, and the committee works closely with the Executive Manager to make recommendations to the Board for needed changes and updates. Thanks to this year's committee members: Iris English, Donna Gauthier, Lili Goncalves, Annette Ozirny, Carrie Rawlake, Delano Tolley, and Robert Deresh (ex officio).

### Resolution Committee

Almost since the very beginning, LICA has had a process in place to address concerns that the affected individuals are unable to bring to successful resolution for themselves. Resource development is an intricate process involving many sectors, and sometimes it's hard to find needed information. LICA's staff are the first line for questions, and are almost always able to provide contact information and quick, effective answers. Calls are always followed up to ensure that the caller is satisfied. Once in a while, though, a more complex issue arises. Perhaps the parties involved are having difficulty coming to agreement, or a landowner feels injured by the actions of an oil company, or a problem is not understood the same way on both sides. While the avenues of regulatory hearings or court action are always available, LICA's Resolution Committee offers an issue-resolution process that works on the principle that if people come together to work things out in a spirit of cooperation, then amicable, effective, mutually beneficial solutions can be found—with far less time, trouble, and expense.

In order that the Resolution Committee can swing into action whenever required, LICA annually designates a slate of committee members. This year the staff has dealt successfully with everything that came their way, and Lili Goncalves, Iris English, Gordon John, and Colin Woods were not called on.

# COMMITTEE

## education+information

### Education & Information Committee

2011 was another busy year for members of the Education and Information Committee (EIC) and LICA administration. It is the mandate of this Committee to provide the community with information on oil and gas activities, updates on research and monitoring completed by the LICA Committees, as well as activities that get community members involved with LICA. The group accomplishes this by providing information sessions, participating in community outreach events, and hosting activities and contests.

This year the group welcomed five new members who brought with them fresh ideas and points of interest. Welcome Chelsie Klassen, Andrea Woods, and Iris English. Thankfully, the EIC retained the core members who have made this committee what it is today - thank you Harold Ross, Judy Cabay, Annette Ozirny, and Shirley Benson, as well as members that have moved on.

The EIC's action packed 2011, was kicked off with a book launch of "World's Greenest Oil - Turning

the Oil Sands from Black to Green" by Dr. Peter Silverstone.

A crowd gathered to hear Dr. Silverstone's views on the sustainable development of our oil sands. The Annual General Meeting was held in May, with an intriguing speaker for a gathering of new and existing members. In April, the EIC kicked off Phase I of "Oil & Gas - From Start to Finish" with "Subsurface Rights." It was a good start to our series and informative material was provided by speakers from the Department of Energy. LICA was able to get some exposure by setting up an information booth at Bonnyville's first Oil and Gas Show. Information booths were also set up at Registration Nights in Cold Lake, Bonnyville, Elk Point and St. Paul. These were all good opportunities to get feedback from community members and to share the knowledge of LICA. In October we were able to continue with Phase II of "Oil & Gas - From Start to Finish" with "When the Land Man Comes." This was another well-attended and very informative presentation. Other events involving community and youth were



the Earth Day Writing contest for middle school students and the Photo Contest, which will continue into 2012. How else could you complete this year, but with the 3rd Annual Christmas at LICA! Great food and wonderful company was enjoyed by all. What a year it was, thank you to all of the members of the EIC and administration team who made it all possible! In case you noted a mis-count above for the "new committee members" - allow us to introduce ourselves,

Committee Co-Chairs,  
Donna Gauthier & Megan St. Amant

Back Row (L to R): Members Annette Ozirny, Harold Ross, and Iris English. Front row (L to R): Members Judy Cabay, Megan St. Amant (Co-Chair), Donna Gauthier (Co-Chair), and Shirley Benson. Missing: Member Andrea Woods and Alternate Member Chelsie Klassen

# 2012 photo contest

LICA is pleased to again be conducting our bi-annual Photo Contest and we are currently accepting entries. Our 2010 contest brought in over 130 photos and excitement related to our 2012 contest is growing.

This contest is open to all amateur photographers that reside, or work, in the LICA region. Photos must be taken within the LICA region and depict the interest and beauty of our area, whether it be nature, wildlife, agriculture, industry, sports, people, or other topics.

Cash prizes and gifts will be awarded for 1st, 2nd & 3rd in both the Adult Division and a Youth Division (age 12 & under as of October 15, 2012). For more information and an entry form please visit [www.lica.ca](http://www.lica.ca) or drop by the LICA office.

Pick up your cameras, start taking those wonderful pictures of the area, and submit your entries (up to 3 photos per person) before October 15, 2012 at 4 p.m. Give us your best shot and good luck!



2010  
winners

A sampling of 2010's winning entries. Top:  
Olen Zellweger.  
Right: Jeremy Hallett.  
Far right: Kacy Marcotte. Bottom:  
Lori Jezowski



# thanks to our VOLUNTEERS

Do you know what happens if nobody does anything? Nothing! What a good thing it is that you don't believe in doing nothing! Lakeland Industry and Community Association is an organization that is based on the concept of cooperation, collaboration, and connection. There are two vitally important words in LICA's Vision - Lakeland Industry and Community Association is a balanced partnership actively supporting a sustainable environment - ACTIVELY SUPPORTING.

Lots of people talk about how much they believe in an organization, or how important it is. But people like you, who not only believe that LICA is important, but also show that it is worth your time and effort, are what make things happen around here. Without you, we would not be much - together, we make great things happen.

Thank you for the time you have spent

being part of LICA, for honouring the commitment you made when you said you would take a seat at one of the LICA tables. Our history of accomplishment and benefit to the community is only possible because you stepped up to the plate.

You are the embodiment of LICA's Values: Trust, Respect, Honesty, Integrity, Equality, Cooperation, Transparency, Accountability, Open-Mindedness, Responsibility, Supportiveness, and Participation!

Thank you!



Iris English  
Chair



Charmaine Code  
Executive Manager



# volunteer profile

## SHIRLEY BENSON

Shirley Benson is a long time resident of the Lakeland, born and raised in the Lac La Biche area, and now a resident of Frog Lake. She brings a wealth of knowledge to the LICA Board, and also the committees she works with.

Shirley has been involved with LICA for over three years, and sits on the Board and several committees as the Metis Nation of Alberta Zone II Representative. Shirley is honoured that the Metis community has bestowed such an important role to her, a position that she takes seriously. Over the past three years Shirley has held seats on the Board of Directors, Education and Information Committee, and the Airshed Zone. Shirley's passion for responsible, safe energy development has fueled her career, and she is proud to say LICA is another

great example of how different interest groups can come together and create a safe environment to discuss, brainstorm, and resolve community concerns and interests.

Shirley's current role as the Vice President for the Metis Nation Zone II Regional Council, along with her past expertise, has been beneficial and complementary as a Board member. As a leader of the Zone II Metis, Shirley strongly believes in promoting positive community engagement with industry, local and provincial governments, as well as non-government organizations. As a Board member, Shirley would like to take this time to say thank you to LICA, the office staff, all the Board of Directors, and Committee members for the great three years. Shirley feels that it has been an extreme pleasure working with everyone.





# a look inside LICA

## Website

The LICA website is a valuable communication tool, allowing us to share information with both our members and other interested individuals.

Visit us at [www.lica.ca](http://www.lica.ca) to see our most recent news, check on today's Air Quality Health Index (AQHI) in the LICA region, download a report or presentation that may interest you, or review the Minutes of Board and Committee meetings.

We are pleased that the site received 5,500 unique visitors during 2011, with those visits coming from 80 different countries/territories. These figures confirm the continuing value of the site and its content, as well as the fact that users are finding the site useful.

Welcome to our website - visit often to keep up to date on LICA's happenings.

## LICA Library

We are pleased to offer our library

for public use. Would you like to learn more about the oil and gas industry? Or perhaps you would like to follow projects pertaining to the Beaver River basin?

The LICA Public Resource Library offers more than one thousand catalogued items covering a variety of topics, in keeping with our mission of gathering, sharing, and acting on information regarding development in our region.

Various studies, annual reports,

publications, books, newsletters, magazines, and CD's can be reviewed electronically or by hard copy in our research area.

Visit LICA's Library at our main office location (5107 W - 50 Street) in Bonnyville. You are always welcome to stop in!

## Twitter

New in 2011, LICA has joined Twitter. To learn what is new, or coming up, follow us at: [www.twitter.com/infoLICA](http://www.twitter.com/infoLICA)

## Community Registration Days

LICA participated in the Community Registration Days held in late August and early September 2011, in Cold Lake, Bonnyville, Elk Point, and St. Paul. People who visited the displays were able to pick up LICA's Annual Report, newsletters, pens, pencils, and notepads, as well as ask questions and discuss LICA's objectives and work. At the Cold Lake event, residents were offered the added benefit of LICA Airshed Zone's "Green Your Ride" vehicle emissions clinic.

Volunteers Ajaz Quraishi and Megan St. Amant in Cold Lake; Annette Ozirny and Andrea Woods in Bonnyville; Mildred Dunham and Bev Smith in Elk Point; and Iris English in St. Paul represented LICA well. Thanks to these volunteers who took the time to sit at the booths and man the clinic - several hundred people got the chance to learn more about LICA as a result. And thank you to each person who visited one of our booths and completed our questionnaires which will help us prepare for the future.



Volunteer Annette Ozirny greets visitors at LICA's booth.

# LICA in our community

## Christmas at LICA

LICA would like to thank everyone who attended the 3rd Annual "Christmas at LICA" Open House held at the LICA office in Bonnyville on December 7, 2011. We had a record 75 people attend our Christmas event and celebrate all of LICA's success over the past year. The evening was full of fantastic food, beautiful decorations and wonderful company. LICA looks forward to an exciting 2012 in the Lakeland region and encourages you to join us at our "Christmas at LICA" Open House in early December, 2012.

## 2nd Annual Earth Day Writing Contest

Our 2nd Annual Earth Day Writing Contest again invited middle school students in the LICA region to write an essay about what Earth Day means to them. 2011 brought more entries than the previous year, with submissions from a number of students and six schools.

# LICA in our community

Topics ranged from personal stories to global warming and cultural concerns.

The 2011 winners were H.E. Bourgoin School students Chantil Costard (1st) and Harlee Cameron (2nd), along with Nelson Heights School student Sabrina Feng (3rd). Each of the winners was presented with a cash prize and a LICA gift. Awareness of the importance of our earth and its well-being continues to increase and also attract more students to this great project. LICA plans to continue sponsoring this contest to encourage discussion of how we can help to protect our earth and its environment. We look forward to 2012 submissions from you and your friends and classmates, and are offering both cash prizes to the winners and a gift pack for each winner's class. Keep up the good work students. An excerpt from Chantil Costard's winning submission:



LICA's Robert Deresh (left) and Harold Ross (right) present 2011 Earth Day Writing Contest winner Chantil Costard with her prizes.

"Lately, I have noticed how much we truly do take advantage of our wonderful earth. Fortunately, I understand how to help, and I recently just completed a science fair study on global warming, and how you can change the effects by doing simple things in our everyday lives.

After seeing the negative effects of global warming, I believe that Earth Day should be a day to look back, and discover how you can make a change. Due to how damaged our earth has become, I learned that Earth Day should not just be one day, it should be every day."

## LICA Annual General Meeting

On May 4, 2011 Lakeland Industry & Community Association hosted its 2011 Annual General Meeting (AGM) at the Bonnyville Seniors' Drop-In Centre. It was a social evening of comradeship, entertainment, great food, and of course the business and elections of an AGM.

We were delighted to welcome guest speaker Dr. Eddy Isaacs, as CEO of Alberta Innovates – Energy and Environment Solutions. Dr. Isaacs highlighted the work being done by that agency to position Alberta for the future in both the fields of energy and the environment.

Representatives from LICA's Education and Information Committee; Airshed Zone; and Beaver River Watershed Alliance (BRWA); outlined the projects they have been working on over the past year as well as upcoming projects.

The 2012 Annual General Meeting will be held on Wednesday, April 18, 2012. We welcome you to join us to see what you can do to make a difference in your community and the Lakeland region. Elections for the positions of Board Directors are held at the Annual General Meeting and you must be a member to vote, but membership is free.

Keep an eye out for further details of the 2012 Annual General Meeting. The event is open to the public and is provided at no charge, as are all LICA events. We hope to see you there.

What's next for "Oil and Gas - from Start to Finish"? \_\_\_\_\_

In 2011, the Education and Information Committee decided that an information series on oil & gas in the area would be beneficial and could take the audience through the process "From Start to Finish" in phases to correspond with the actual phases of resource development.

Phase I, held at Riverhurst, provided a presentation on "Subsurface Rights" covering mineral rights, land auctions and the differences between dealing with reserve land, private land and lease land. Phase II, "When the Land Man Comes," was a presentation in La Corey given by two knowledgeable land agents who left attendees well-informed.

Where are we today? There are still a number of phases remaining:

- Phase III, a March 2012 presentation at Fort Kent, delved into "The Environment" and looked at environmental requirements and guidelines followed by local producers at each stage of oil and gas projects.
- The next stop on our journey, Phase IV, will tackle "Exploration" - presenters will uncover the mystery of well placement and what seismic reveals.

- From there the series will move into Phase V "Operations" - the processes that get the product out of the ground.
- Finally, the series will conclude with information on where the product goes and what it becomes.

Please contact the LICA office or web site at [www.lica.ca](http://www.lica.ca) for the dates and locations of the presentations throughout 2012 and consider joining us for an informative and interesting evening over complimentary dinner.

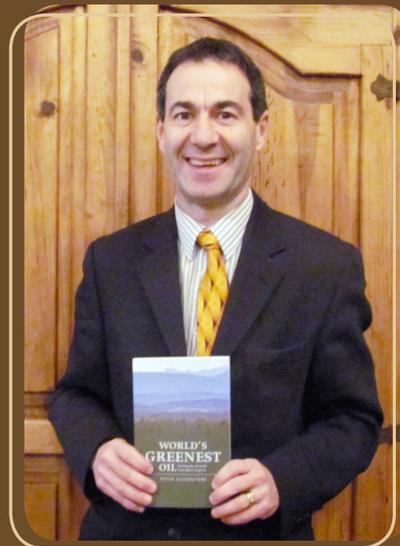
### "World's Greenest Oil" Book Launch

On January 20, 2011, the Lakeland Industry & Community Association, in partnership with the Beaver River Watershed Alliance and LICA's Airshed Zone, presented the book launch of "World's Greenest Oil - Turning the Oil Sands from Black to Green," with guest speaker and author Dr. Peter Silverstone. The book launch, which took place at the Shaw House in Bonnyville, was well attended, with a number of thought provoking questions and comments being generated by the audience.

Throughout the presentation, Silverstone explained the questions his book attempted to answer. Specifically, Silverstone questions whether, in terms of greenhouse gas (GHG) emissions, are the oil sands "dirty"? If so, what are the implications? This complex issue is

explored in detail in the book, and a potential solution is suggested that could benefit the environment, the oil sands industry, every Albertan, and the Alberta government.

Silverstone, a physician, professor, academic, and businessman carried out extensive research prior to publishing this book, and encouraged us to visit [www.GreenestOil.com](http://www.GreenestOil.com) to examine the source material.



LICA in our  
community

# LICA airshed zone

Wow, it's hard to believe that another year has come and gone. 2011 was a great year and the LICA Airshed Zone continues to mature as time goes on. The continuous air monitoring network has yet another successful full year of operation under its belt and we've added a second plot to our soil acidification monitoring project.

There wasn't much change in our air monitoring network in 2011, except for changes to the Alberta Ambient Air Quality Objectives (AAAQO), which are set by Alberta Environment and Water, and which we compare our actual air measurements to. The acceptable concentrations for several parameters; Nitrogen Dioxide (NO<sub>2</sub>) and Sulfur Dioxide (SO<sub>2</sub>); were reduced.

We also had lots of fun in 2011 hosting a Vehicle Emissions Clinic. It was great to see community members come out and get their vehicle tested for free and find out what emissions were being emitted from their tailpipe and how efficiently their vehicle was running.

Looking ahead to 2012, we'll be updating our LICA website ([www.lica.ca](http://www.lica.ca)) to reference the Air Quality Health Index (AQHI) tool which Alberta Environment and Water adopted in 2011. The AQHI let's you know whether there is a potential health risk posed by the air quality outside and it also has a forecasting feature so you could look at the anticipated air quality for the current day, night and the following day. We'll also be adding a third soil monitoring plot to our soil acidification monitoring program and relocating our portable trailer from north of Bonnyville to the Elk Point airport.

A big thank-you to all of our committee members for your participation in the LICA Airshed Zone, without your valuable time and input, we wouldn't be a multi-stakeholder group sharing regional air quality data and addressing community concerns.

Words can't express our gratitude to Michael Bisaga, our Airshed Zone



Back Row (L to R): Kellie Nichiporik (Observer), Harold Ross (Member), Shawn Brockhoff (Alternate Member). Middle Row (L to R): Shirley Benson (Member), Michael Bisaga (Program Manager), Ajaz Quraishi (Alt. Member), Lili Goncalves (Co-Chair), Robert Deresh (Co-Chair), Doug Wong (Member), Marie Ilchuk (Member). Front Row (L to R): Megan St. Amant (Member), Mildred Dunham (Alt. Member), Kathleen Zellweger (Alt. Member), Wally Qui (Alt. Member). Missing: Members Dianne Brownless, Roland Dion, Kaylee Kinch, Monty Moore, Annette Ozirny, and Alternate Member Jasmine Birk.

Program Manager, who is the key person responsible for the successful operation of the LICA regional air monitoring network and the staff at LICA for supporting us.

Air quality is important for everyone and if you want to learn more, please visit the LICA website ([www.lica.ca](http://www.lica.ca)), call us (1-877-737-2182) or join us at one of our monthly meetings in Bonnyville - we welcome public participation and input. Hope to hear from or see you and all the best in 2012.

Lili Goncalves and Robert Deresh  
Co-chairs, LICA Airshed Zone

## Monitoring Programs Overview

In 2011, the LICA airshed monitoring network consisted of four continuous monitoring stations, 26 passive monitoring stations, two volatile organic compound and polycyclic aromatic hydrocarbon samplers, and two soil acidification monitoring plots.

Continuous monitoring stations provide up-to-the-minute measurements of ambient concentrations for several man-made (anthropogenic) and natural emissions. For 2011, the locations were in Cold Lake South (Cold Lake South station), southwest of St. Lina (St. Lina station), north of Bonnyville near the Beaver River (Portable station), and in the immediate vicinity of thermal heavy oil operations approximately 10 kilometers southwest of Marie Lake (Maskwa station). They sample for several parameters including sulphur dioxide, hydrogen sulphide, reduced sulphur compounds, ozone, oxides of nitrogen, total hydrocarbons, and particulate matter.

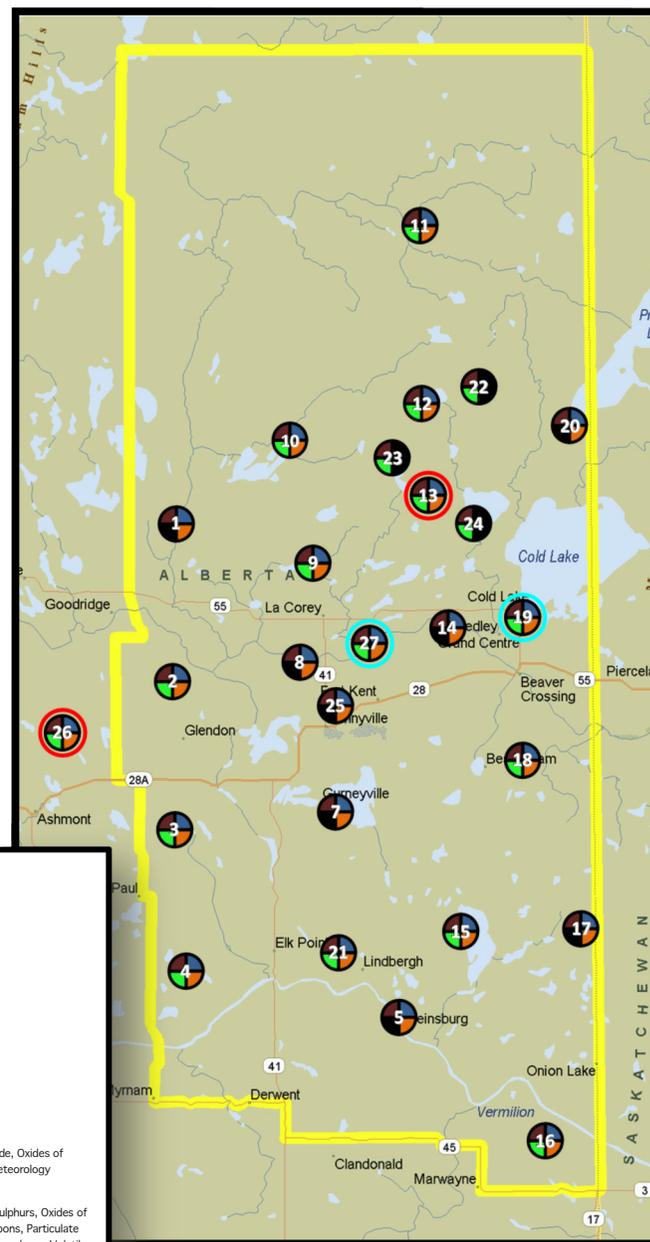
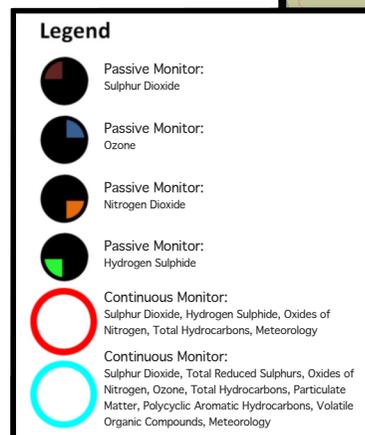
Passive monitoring stations generally follow a 3x3 township grid distribution pattern; samples are analyzed once per month. The data is used for understanding regional patterns in air quality and for long term trend analyses. Ozone, nitrogen dioxide, sulphur dioxide, and hydrogen sulphide are sampled for.

Sampling for volatile organic compounds and polycyclic aromatic hydrocarbons is carried out at selected locations, currently at the Cold Lake South and Portable stations. 24-hour integrated samples are collected every six days in accordance with the National Pollutant Surveillance (NAPS) program; hundreds of compounds can be detected using this method.

In 2010 and 2011, LICA established a fourth type of long-term monitoring - soil acidification sampling at plots in Moose Lake Provincial Park and Whitney Lake Provincial Park.

LICA's soil monitoring enhances an already-existing AEW soil acidification monitoring program near the Cold Lake Fish Hatchery. A third LICA-operated site will be added in 2012 in the northern part of the airshed zone.

- |                    |                  |                      |                        |
|--------------------|------------------|----------------------|------------------------|
| 1. Sand River      | 9. La Corey      | 16. Clear Range      | 22. Burnt Lake         |
| 2. Therien         | 10. Wolf Lake    | 17. Fishing Lake     | 23. Mahihkan           |
| 3. Flat Lake       | 11. Foster Creek | 18. Beaverdam        | 24. Hilda Lake         |
| 4. Lake Eliza      | 12. Primrose     | 19. Cold Lake South  | 25. Town of Bonnyville |
| 5. Telegraph Creek | 13. Maskwa       | 20. Medley/Martineau | 26. St. Lina           |
| 7. Muriel/Kehevin  | 14. Ardmore      | 21. Fort George      | 27. Portable Station   |
| 8. Dupre           | 15. Frog Lake    |                      |                        |



	Units	Alberta Ambient Air Quality Objectives			Cold Lake South Station					St. Lina Station					Maskwa Station					Portable Station				
		1-hour	24-hour	Annual	Annual avg	1-hour max	# of exceedences of objectives			Annual avg	1-hour max	# of exceedences of objectives			Annual avg	1-hour max	# of exceedences of objectives			Annual avg	1-hour max	# of exceedences of objectives		
							1-hour	24-hour	Annual			1-hour	24-hour	Annual			1-hour	24-hour	Annual			1-hour	24-hour	Annual
		1-hour	24-hour	Annual	Annual avg	1-hour max	1-hour	24-hour	Annual	Annual avg	1-hour max	1-hour	24-hour	Annual	Annual avg	1-hour max	1-hour	24-hour	Annual	Annual avg	1-hour max	1-hour	24-hour	Annual
Nitrogen Dioxide	ppb	<b>159</b>	n/a	<b>24</b>	3.9	43.0	0	n/a	0	1.7	22.0	0	n/a	0	2.9	49.0	0	n/a	0	3.6	32.0	0	n/a	0
Ozone	ppb	<b>82</b>	n/a	n/a	26.0	62.0	0	n/a	n/a	30.0	63.0	0	n/a	n/a	Not monitored at this station					26.0	59.0	0	n/a	n/a
Particulate Matter (PM <sub>2.5</sub> )	µg/m <sup>3</sup>	n/a	<b>30</b>	n/a	5.7	187.5	n/a	<b>1</b>	n/a	5.9	291.0	n/a	<b>3</b>	n/a	Not monitored at this station					5.7	262.7	n/a	<b>2</b>	n/a
Sulphur Dioxide	ppb	<b>172</b>	<b>48</b>	<b>8</b>	3.0	40.0	0	0	0	0.2	7.0	0	0	0	0.6	26.0	0	0	0	0.1	7.0	0	0	0
Total Hydrocarbons	ppm	n/a	n/a	n/a	2.2	5.4	n/a	n/a	n/a	2.1	5.5	n/a	n/a	n/a	2.2	6.3	n/a	n/a	n/a	2.5	15.9	n/a	n/a	n/a
Total Reduced Sulphur	ppb	n/a	n/a	n/a	0.3	3.0	n/a	n/a	n/a	Not monitored at this station					Not monitored at this station					Not monitored at this station				
Hydrogen Sulphide	ppb	<b>10</b>	<b>3</b>	n/a	Not monitored at this station					0.1	2.0	0	0	n/a	0.2	12.0	<b>2</b>	0	n/a	0.1	8.0	0	0	n/a

### Continuous Monitoring Data Summary

LICA's four continuous monitoring stations form the backbone of the regional monitoring program. They monitor for parameters that represent emissions from a wide range of natural, industrial, non-industrial, and mobile sources. The LICA network's chosen air quality parameters reflect local emission sources; monitoring methods are consistent with those in other Alberta airshed zones. Various meteorological parameters, such as wind speed and direction, temperature, and barometric pressure are also monitored to help identify possible sources and processes that affect the distribution of pollutants.

Elevated concentrations of nitrogen dioxide

were measured in Cold Lake due to urban emission sources, including vehicles and home heating. Despite being near substantial fossil fuel combustion sources including large thermal heavy oil facilities, the Maskwa station measured some of the lowest concentrations of nitrogen dioxide among LICA's continuous monitoring stations. No Alberta Ambient Air Quality Objectives (AAAQO) for nitrogen dioxide were exceeded.

Sulphur dioxide measurements were highest at the Maskwa station with its nearby thermal heavy oil recovery plants; these industrial facilities are the prominent sulphur dioxide source in the LICA area. Similarly, hydrogen sulphide and total hydrocarbon concentrations were highest

at the Maskwa and Portable stations, likely due to neighboring cold-flow heavy oil pads and thermal oil recovery facilities. On Friday May 27, 2011, between midnight and 3 a.m., the Maskwa station detected two exceedences of the 1-hour AAAQO for hydrogen sulphide.

Investigation into the cause and source of these exceedences was inconclusive; however, the episode was short-lived and there were no public complaints of the typical rotten egg odor associated with elevated hydrogen sulphide concentrations.

Relative to other airsheds in Alberta, ozone is generally measured at lower concentrations in the LICA area. In LICA's urban areas, ozone formation is limited by nitric oxide. The combination of

substances and meteorological conditions that lead to rapid ozone formation prevalent in other areas of the province does not exist in local rural areas, so LICA does not have the ozone-related air quality issues common to other parts of Alberta.

In the early morning hours on Friday June 3, 2011, the LICA network detected a number of elevated fine particulate matter (PM 2.5) readings at all stations equipped to monitor this parameter (Cold Lake South, Portable, and St. Lina). The large forest fire burning in the Richardson back country was the likely cause of the regional smoke episodes, which resulted in poor and very poor air quality index values. By the time the workday started, air quality in Cold Lake was rated as fair by around 7 a.m. and good by 9 a.m. As a result of the elevated particulate matter concentrations, there were exceedences of the 24-hour and 1-hour Alberta AAAQOs for particulate matter at the Cold Lake South, St. Lina and portable monitoring stations.

The table provides a summary of LICA's continuous monitoring program for 2011 and presents available Alberta Ambient Air Quality Objectives for comparison.

### Duplicate Sampling Project

For two years starting in May 2009, duplicate sampling was carried out at LICA passive monitoring stations. These duplicate samples were taken at 100% of the sampling sites, however on an alternating month basis (half of the sites were sampled in duplicate one month, while the remaining half was sampled in duplicate the following month). Co-located sampling (where passive samplers were used in conjunction with continuous monitors) also occurred at 4 sites during the sampling program.

This study was undertaken to satisfy a request made by Alberta Environment and Water to better understand apparent discrepancies in passive data found within the LICA airshed. A suggestion to investigate discrepancies in passive data was also made by RWDI (LICA's contracted consultant) in their 2008, Review of the LICA Ambient Air Quality Monitoring Network.

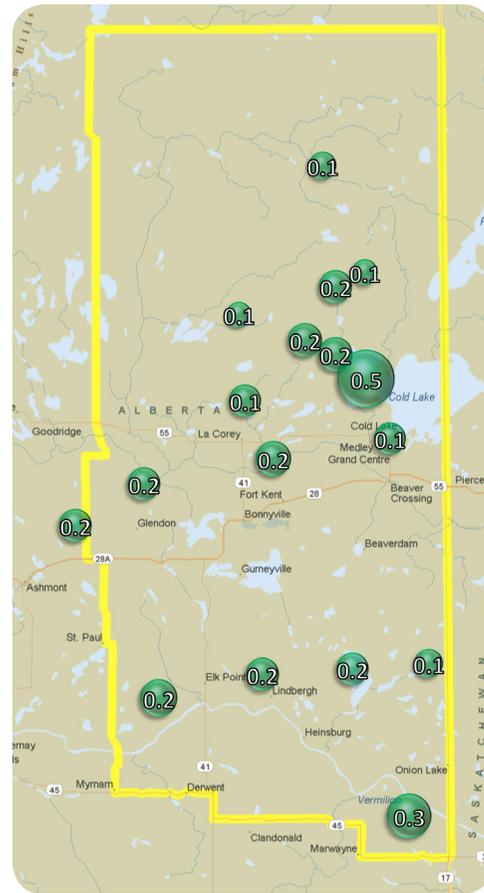
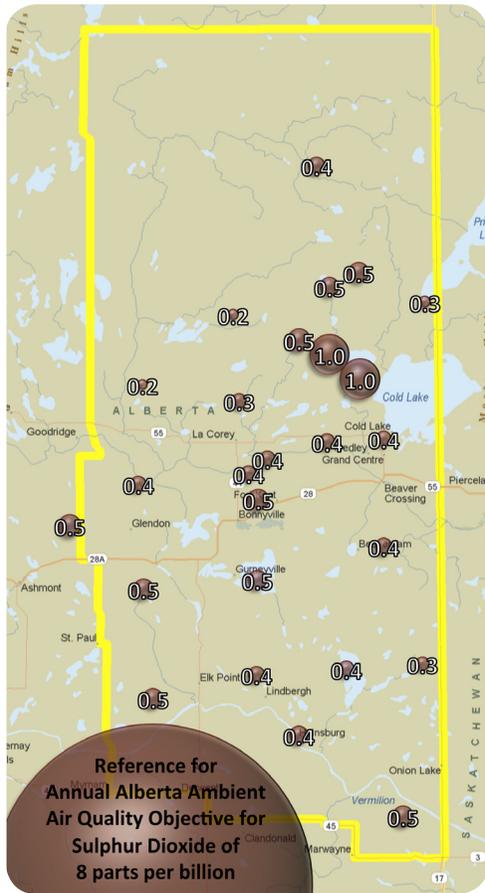
There are what appear to be discrepancies between reported values of passive samplers when compared to continuous monitors in the LICA monitoring network. Alberta Environment and Water and RWDI's suggestion to investigate these discrepancies is based on the fact that all management strategies benefit from as accurate data as possible when making management decisions. Both RWDI and Alberta Environment and Water identified the precision and accuracy of the passive monitoring data as the two factors that required further investigation.

One of LICA's passive monitoring stations sampling for parameters in duplicate.

LICA engaged a graduate student in 2011 to work on this project. The prospect of having LICA's data used in an academic paper is very exciting; the student is studying at Royal Rhodes University (Victoria) and is completing a Masters Thesis based on the data from the LICA network. Work on this project is expected to be complete in early 2012.







airshed

The highest concentrations of **SULPHUR DIOXIDE** (like hydrogen sulphide) were measured near the thermal heavy oil plants northwest of Cold Lake, due to the thermal recovery oil sands facilities nearby; these facilities are the primary source of sulphur dioxide in the LICA area. These elevated annual average concentrations were still well below the annual Alberta Ambient Air Quality Objective of 8 ppb.

Elevated concentrations of **HYDROGEN SULPHIDE** were measured at the stations close to thermal recovery heavy oil plants; not surprising, since these plants are a source of hydrogen sulphide in the LICA area. Elevated concentrations of hydrogen sulphide were also measured near Lake Eliza and Clear Range in the southern areas of the airshed, likely caused by decaying organic matter in shallow ponds and sloughs as well as small feedlots in the area. There is no current annual Alberta Ambient Air Quality Objective for hydrogen sulphide.

## Soil Acidification Monitoring Project

In 2007, LICA commissioned an exploratory study to determine potential soil and water acidification impacts within the region; the final report from that study included recommendations for future soil chemistry monitoring. Since 2010 LICA has been identifying suitable locations and has set up long-term soil sampling plots.

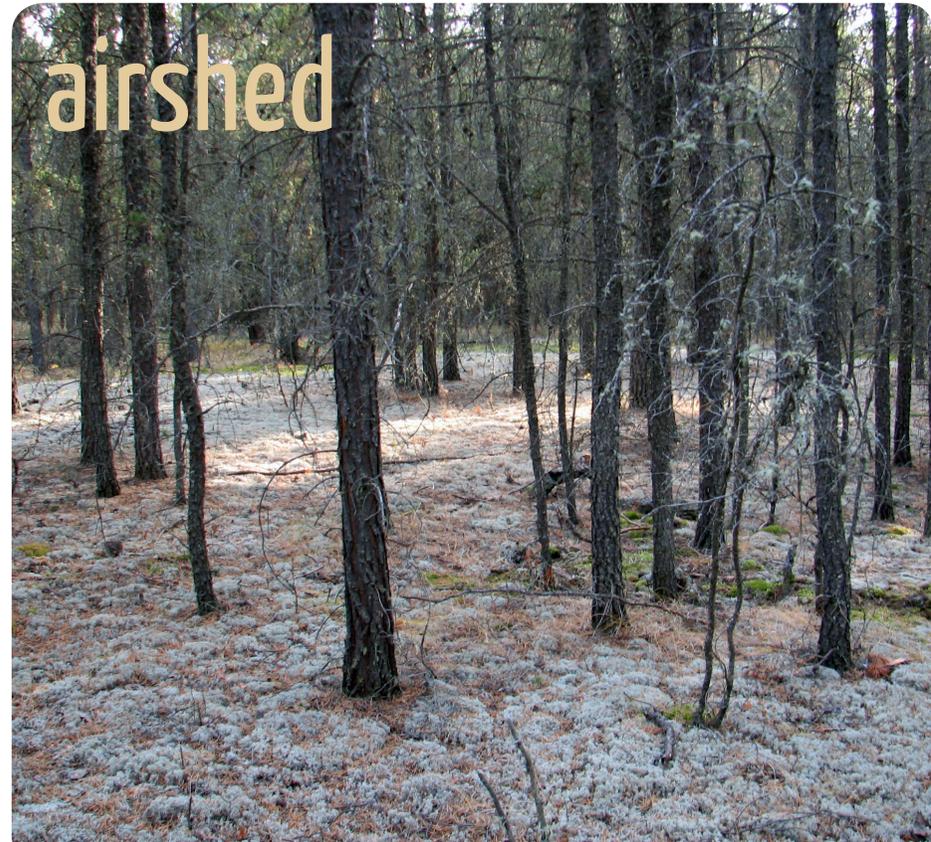
LICA adopted Alberta Environment and Water's protocol for long term soil monitoring. A study to examine and select potential sites for monitoring was initiated in fall 2009, beginning with a review of existing information about the distribution and properties of soils in the LICA study area. The 2007 LICA study provided a means for targeting potential monitoring sites because it provided information about sensitive soil locations as well as current levels of exposure to acidic deposition. Major considerations and criteria for selecting long term monitoring sites included:

- Soils should be sensitive to acidic deposition, as indicated by low acid buffering capacity
- Sites should be on similar soils and under similar native vegetation; generally sandy soils under jack pine stands are used in the Alberta Environment and Water program
- Landscape should be well drained and have gentle slopes
- Sites should have a high likelihood of long-term protection from development, since soil chemistry changes are slow and monitoring needs to be long-term.

LICA used these criteria to select soil acidification monitoring sites to enhance the regional monitoring program. The first site was established in October 2010 in Moose Lake Provincial Park. A second site was established in Whitney Lake Provincial Park in October 2011. These new sites are the next steps in the work started in 2007 and add to the data from an existing acidification monitoring plot in the region operated by the provincial government.

Forest sampling site at  
Whitney Lake Provincial Park

At each site, two plots are selected (redundancy in case one is destroyed by forest fire). Each plot is then divided into 12 sub-plots, which are each divided into 12 cells. One cell within each of the 12 sub-plots is sampled every four years, providing 12 replicates for statistical analysis. The layers (depth) sampled in each sampling cell are: the leaf litter layer; 0-2, 2-5, 5-10, 10-15, 15-30, 30-45, and 45-60 cm. At each of the sampling sites, soil profile descriptions were also completed according to Canadian Soil Classification System protocols. The data collected in 2010 and 2011 provide a measure of baseline conditions for soil monitoring at the Moose Lake and Whitney Lakes Provincial Park sites. Statistical analyses of future samples will determine if there is any change over time.





LICA volunteers conduct a vehicle emissions test on a local resident's Jeep (top) and even an ATV (left) at Cold Lake's Community Registration Day last fall.

## Green Your Ride! Vehicle Emissions Clinic

In late August, Lakeland Industry and Community Association provided area drivers with an opportunity to learn about the environmental impact of their vehicle and how maintenance or repairs may reduce tailpipe emissions and increase fuel efficiency. LICA's 'Green Your Ride' clinic included FREE tests of tailpipe emissions, tire pressure, and the vehicle's gas cap seal.

Nearly 60 vehicles were tested and drivers were provided with insight regarding the 'environmental performance' of their vehicle. Participants received a report card that included the results of several tests including tailpipe emissions of various substances (hydrocarbons, carbon monoxide, carbon dioxide, and oxygen), trouble codes from vehicles' onboard diagnostics computer including the emissions control system, and tire pressure. For diesel-fueled cars and trucks, report cards also included exhaust opacity test values.

Buying green is just the first step in reducing the environmental impacts of automobile use. Vehicle choice is most important but how a vehicle is driven and how well it is maintained will also make a difference. Based on the success of the clinic, LICA looks forward to hosting similar events in the future.

# airshed

# beaver river watershed alliance (brwa)

“We’ve only just begun” (made famous by The Carpenters) aptly describes the Beaver River Watershed Alliance. Not to belittle our accomplishments to date, but we have an ambitious program planned for the future.

Our projects, despite being a small geographic area, have significantly brought BRWA forward in its planning work.

We feel that understanding many aspects of the watershed as possible will enable us to better develop our integrated watershed management plan (our next big task). The integrated watershed management plan is mandated by the provincial government as part of the “Water for Life” strategy. Currently, we are progressing with the State of the Watershed report which will be instrumental for the creation of our integrated watershed management plan. Many of our projects are ongoing annual initiatives such as the Alberta Lake Management Society LakeWatch Program and the Winter Lake Level Study; others are nearing completion such as the Aquatic Ecosystem Health Assessment Index of Biotic Integrity and Lakeland Uranium Study.

This has also been a year of loss and also growth. Although



Beaver River Watershed Alliance as



Back Row (L to R): Gordon Graves (Co-Chair), Harold Ross (Alt. Member), Georges Binette (Alt. Member), Robert Deresh (Member), Don Sinclair (Member), Delano Tolley (Member), Joe Prusak (Member), Ajaz Quraishi (Member), Bill Fox (Alt. Member). Front Row (L to R): Kirby Brockhoff (Program Assistant), Kay Lee Kinch (Member), Kellie Nichiporik (Co-Chair), Eleanor Kneffel (Program Manager), Donna Gauthier (Alt. Member). Missing: Members Dianne Brownless, Heather Harms, Duane Lay, Monty Moore, Adolph Porcina, Keith Schick, and Jordan Walker; and Alternate Members Bob Buckle, Irwin Kehewin, Alvin Kumpula, Maria Priestley, Pat Valentine and Dwayne Latty.

we have lost a few members, we have been gaining new ones.

As we move forward into the new year we will continue to expand our knowledge and be able to improve our relationships in the community and share our understanding with everyone. Thank you for a wonderful year and we are looking forward to 2012.

Kellie Nichiporik and Gordon Graves  
Co-Chairs, Beaver River Watershed Alliance

## Shoreline Cleanup

Once again the Beaver River Watershed Alliance participated with the Great Canadian Shoreline Cleanup in a nationwide effort to help clean the shores of our country. For the second year in a row, Loblaw Companies Ltd. was the presenting sponsor of this event. Other national sponsors included the Vancouver Aquarium, World Wildlife Fund Canada, Home Depot, and Molson Canadian.

Locally, Bonnyville Home Hardware and Dale's Rentals contributed to the cleanup effort. Home Hardware kindly donated 20 pairs of leather work gloves to supply all the volunteers with a pair each. Dale's Rentals checked the public restrooms along Jessie Lake to ensure they were fresh for the event and also provided a portable washroom and washing station. Both of their donations were greatly appreciated by all those who got their hands dirty cleaning up that day.

This year Mother Nature was kind and provided sunshine for the local volunteers who showed up to clean the shores along Jessie Lake. They



divided into groups of 3-4 people to each clean a different section of the shoreline. Over 5 km of shoreline was covered with more than 55 kilograms of garbage and recycling removed from the shores of Jessie Lake.

After a morning's work of picking debris all the volunteers were invited to the LICA office for a hot meal and beverage as a small thank you for their participation. Without all the wonderful volunteers who took the time to come out and make a difference right here in our own backyard, this event would not have been possible. Thank you to Charman Alm, Lucie Bell, Georges Binette, Melanie Cadrin, Carolyn Campbell, Amy Clarke, Mary Binette,

Jim Cheverie, Robert Deresh, Kay Lee Kinch, Tanya Kostiw (Bonnyville Nouvelle), Kellie Nichiporik, Ajaz Quraishi, Harold Ross and Leonard Sinclair. See you all again next year!

## Steering Committee Tour

This annual tour is an opportunity for the Steering Committee members to augment their knowledge and awareness of the watershed in real time. Much time is spent in the boardroom deliberating important points of watershed issues, making decisions and learning, but going out and employing sight, sound, touch and smell gives a greater depth of understanding about what an amazing watershed this is that no

amount of power point presentations, reports and aerial photographs can ever convey.

This year on August 25, a bright sunny, breezy day, saw many of the Steering Committee members out by the junction of where the Beaver and Sand rivers meet. Ron and Linda Fox very graciously permitted us to come to their property and take a tour along the Beaver River and see the Sand River joining up. They were even so kind as to come and pick us up with their school bus in Bonnyville. Emma Dutarte, Stan Streets, and Larry Lofstrand joined us on the tour and gave accounts of their childhood years growing up in this area. Historical context is always interesting and helpful to get a richer sense of the area. A huge thank you to Ron, Linda, Emma, Stan and Larry for making this tour so enjoyable. Also, a big thank you to Bill Fox, BRWA Steering Committee member for making the arrangements.

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## Steering Committee Growth & Development

The Steering Committee was busy in 2011 participating in a number of conferences, forums and workshops held by other organizations and agencies. These events help inform the Committee members and staff on a number of general watershed related topics, e.g. cutting edge research in the science, social and economic aspects of water and watershed management, awareness of initiatives and learnings from mostly throughout the province, nationally and internationally. These events also allow for networking opportunities, relationship and potential partnership building, and general information sharing. Many of the BRWA's projects and education and outreach initiatives have come about from hearing about what others are doing, and modifying these for this watershed's and community's needs when appropriate. Also, many partnerships have been formed to help carry out these activities.

The group's activities included:

- February 24 - Workshop on Collaborative Water Governance (National Roundtable on the Environment and Economics and the North Saskatchewan Watershed Alliance), Nisku, AB
- March 15 - AgForum (Agri-Environmental Partnership Alberta), Nisku, AB
- April 10-12 - "Land and Water: Reducing Our Impacts...What happens on the land, doesn't always stay on the land..." (Canadian Water Resources Association), Red Deer, AB
- May, various dates - Lower Athabasca Regional Plan – Stakeholder and Public Consultation various Alberta locations.
- June 28 - Alberta Environment and Watershed Planning and Advisory Councils Forum (Alberta Environment), Leduc, AB
- August 5 - Northeast Watershed Team (NEWT) Inaugural meeting, M.D. of Bonnyville
- September 1 - Official Community Planning Workshop (North of Divide Community Association), Meadow Lake, SK
- September 30 - October 1 - Urban Lakes & Wetlands Workshop (Alberta Lake Management Society), Chestermere, AB
- October 12-14 - Watershed Planning and Advisory Councils (WPAC) Summit 2011 (Lesser Slave Watershed Council and Athabasca Watershed Council), Slave Lake, AB
- October 13 - Soil and Water Health: Our Key to Survival (Bentley Lecture Series), University of Alberta, Edmonton, AB
- November 25 - Integrating Wetlands and Watershed Planning (Alberta North American Wetland Management Plan Partnership), Leduc, AB

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### Healthy Water Workshop

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When dealing with ecology and water quality, it is easy to overlook the importance of groundwater and the role it plays in our day to day lives. And with such a large and growing rural population it is more important than ever that we keep the health of groundwater a priority. If you get your household water from a water well, the water quality and quantity can greatly impact your life both short and long term.

There is considerable lack of awareness of how domestic water wells function and the regular maintenance they require. That is where this session comes in to play. As part of the Alberta Environment's Partners in Resource Excellence program, highly qualified speakers are assembled to provide hands on information about the ins and outs of domestic water wells. Participants are asked to provide basic information beforehand so that the presenters can pull up well reports and bring them to the workshop. The owners can then ask questions specific to their well and have individual and group discussions around it. Additional information provided at the workshop includes groundwater basics, common well problems, how to properly maintain your well to ensure water quality and quantity and how to avoid possible contamination of your well. Our water wells are not a "drill it and forget it" type of system and the more we educate ourselves about them, the better we are able to maintain them and address any issues that may arise.



(brwa)

Participants listen in during BRWA's March 2011 Health Water Workshop

### Walking With Moose

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Each year the Beaver River Watershed Alliance is proud to be a part of this event hosted by the Moose Lake Watershed Society. Walking With Moose is an educational adventure for grade 5 and 6 students providing them a day full of activities. These include a guided hike through a forested area, playing informative games, and wading into the lake and discovering the abundance of life right next to the shoreline. The students are asked questions before and after certain portions of the day and it is amazing to see how their perceptions change about what constitutes healthy and non-healthy ecosystems.

Schools throughout the Beaver River Watershed are contacted in an effort to give as many different classes a chance to participate. Last year we had several Bonnyville classes as well as students from Iron River and other smaller centers. To ensure all the schools

have access to this field trip, it is designed so that there are no costs incurred by any of the participating classes and transportation and lunch are provided free of charge. The schools' only obligation is to help provide adequate supervision for the number of students involved. Numerous partners in the project whom we would like to thank who give talks and presentations at Walking with Moose include personnel from Sustainable Resource Development (SRD), Alberta Riparian Habitat Management Society, more commonly known as 'Cows and Fish,' Alberta Parks Tourism and Recreation, M.D. of Bonnyville, Moose Lake Watershed Society, and volunteers from the BRWA Steering Committee. Without all their assistance and the parents who come and help supervise the children, the day would not be possible and we would like to thank each and every person who helped make 2011's sessions a huge success.

## Alberta Lake Management Society (ALMS) 2011 LakeWatch Program

In summer 2011 volunteers once again graciously assisted the ALMS Technicians as they took samples from nine lakes in the Beaver River Basin. They headed out on the water four to five times during June to September collecting important physical data such as water temperature, clarity and pH. After all the data is collected, ALMS produces a water quality report together with recommendations for each lake that both informs lake users and guides water restoration and management efforts <http://www.alms.ca/content.php?content=1#REPORT>.

Thank you to the 2011 volunteers without whom this program would not be possible. Ken Dion (Kehewin), Bill Lasecki and Ron Young (Crane), Dean Schneider (Hilda), Bev Smith (Laurier), Orest Kitts (Skeleton North), Peter Sherman and Roy Nilson (Skeleton South), Gary Kissel (Minnie), Terry Noble (Lac Sante), Carmen and Sean Verrier (Moose). Also a big thank you to LICA for their continuing support of LakeWatch (since 2002).

Ten lakes, yet to be determined, will be sampled in 2012. If you would like to volunteer with the sampling and have access to a motorized boat, please read the Volunteer Welcome Pack on the ALMS website: [www.alms.ca/content.php?content=1#VWP](http://www.alms.ca/content.php?content=1#VWP). To volunteer contact BRWA via email at [ek.brwa@lica.ca](mailto:ek.brwa@lica.ca) or by phone at 780.812.2182.

(brwa)



Preparing for data collection at North Skeleton Lake.

## Groundwater Trace Metal Study

The BRWA carried out its second groundwater sampling project in 2011 and early 2012 as part of its Community Groundwater Assessment Program. Previous trace metal studies with Alberta Health and Wellness (2009) and the BRWA study (2010) focused on human drinking water wells.

This time the BRWA looked at water quality from

livestock watering sources including wells and dugouts primarily, and a few streams. To be eligible for the study, these water sources could also be used for human drinking water purposes.

We followed the same process as in years past looking at routine chemicals (nitrates, calcium, etc.), physical parameters (e.g. pH, turbidity, etc.), 23 trace metals (e.g. arsenic, lead, mercury, zinc) and

arsenic (As) speciation (As +3, arsenite, and As +5, arsenate). An additional feature this time included testing the sediments filtered from dugout water samples that were turbid (visible sediments) for arsenic.

The BRWA is anticipating a summary report to be completed in spring 2012 and will be available on our website.

## State of the Watershed (SoW)

The BRWA is nearing completion of its first State of the Watershed (SoW) Report that will be finalized in March 2012. The SoW Subcommittee has been very busy this past year reviewing drafts and providing guidance to the project. Watershed residents and stakeholders have also had the opportunity to review the draft report and provide feedback in early 2012.

The purpose of the SoW is as the title suggests; to assess what the current condition of various indicators in the watershed are, to allow us - residents and stakeholders - to use this as a tool so that as circumstances in the watershed may change we can plan for those changes while meeting the Government of Alberta's Water for Life Goals (2003):

1. Safe, secure drinking water;
2. Healthy aquatic ecosystems;
3. Reliable, quality water supplies for a sustainable economy.

Indicators that the current SoW is looking at include water allocations (surface and groundwater), i.e. water licensing – this

gives us an estimate about water usage in the basin, for example. Other indicators include aquatic ecosystem health, e.g. the fish-based Index of Biotic Integrity in the Beaver River project completed in 2011 - how are the fish populations doing in number, diversity and health. For example, if the fish are low in diversity and numbers and we have lower level food-chain fish than a good balance with higher level food chain fish, it means there are water quality and quantity issues in the Beaver River.

Conditions that could change in the basin, and likely will over time, are indicators such as population, residential, agricultural and a variety of industrial developments. Natural changes could include precipitation and temperature fluctuations over a long period of time.

By considering different scenarios and having at hand sound, scientific knowledge on the conditions of the Beaver River watershed, we can collectively make decisions on what we would like the outcomes of those changes to be while a) considering the needs of all stakeholders and b) maintaining a healthy, sustainable environment that supports us for many generations to come.



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## Aquatic Ecosystem Health Assessment

Aquatic ecosystem health is one of the key goals of the Water for Life Strategy and the BRWA is actively working on assessing this in the Beaver River watershed via several projects.

One of these has been the Fish-Based Index of Biotic Integrity the Alberta Conservation Association has been carrying out on the Beaver River and parts of the Sand River since 2009. The final report is available on the BRWA website [www.beaverriverwatershed.ca](http://www.beaverriverwatershed.ca).

A new pilot project we started in 2011 was a stream crossings assessment to get a sense of culvert and stream crossing conditions in the Beaver River basin overall, and more specifically in the Manatokan and Jackfish sub watersheds. The functionality of the crossings is important in determining the degree of watershed fragmentation, which can affect the health of aquatic ecosystems such as fish passage and mobility.

Working in partnership with stakeholders

to assess watershed fragmentation and find potential solutions that may lead to mitigation, restoration and prevention are an important part of the BRWA's AEHA program.

The BRWA is also developing a database and digital repository of all reports, data, maps and other information on all projects and research carried out in the Beaver River basin to assist with aquatic ecosystem health, state of watershed reporting, and integrated watershed management planning.

## Integrated Watershed Management Plan (IWMP) \_\_\_\_\_

The BRWA completed its Terms of Reference (ToR) in March 2012 for the IWM planning process that will take three to four years to complete. The ToR outlines how the process will be carried out, for how long and what the milestones and anticipated outcomes will be along the way. Developing the watershed plan is very much based on stakeholder and public input as it is the stakeholders and public that will put into practice the plan they helped to build. Stakeholders include the community and residents of the watershed, various departments and levels of government, non-government organizations, First Nations, Métis, and practitioners of all the key industries that take place in the watershed. The more participants in the process the better. Though that may seem like it could make the process unwieldy and slow, the participation and the working through of potential challenges in a cooperative way makes for a very strong plan and general community and stakeholder satisfaction with the plan. A robust plan also means there will be motivation by all who

contributed to its development to carry out its objectives and goals. All of the projects and activities of the BRWA ultimately provide information about the watershed and are reflected in the State of Watershed Report, which in turn provides a foundation for the IWMP.

Key estimated IWMP timelines:  
April 2012 to March 2013 – Public and Stakeholder consultation and input  
April 2013 to March 2014 – Drafting, writing and review of the Plan  
March 2014 to April 2015 – Plan approval

Watch for upcoming notices on participation and input sessions near you.

## Watershed Enhancement \_\_\_\_\_

2011 saw the BRWA moving past the planning stages and into the implementation portion of this multifaceted project. The Watershed Enhancement program is an effort to have more of an impact at the grassroots level while also providing educational elements illustrating how our activities can affect the ecology around us.

Looking for partners to work with the BRWA reached out to the individual



(brwa)

Watershed Stewardship Groups (WSG) within the basin. Some new relationships were built and ongoing ones strengthened. Working in cooperation with the Moose Lake Watershed Society and the Skeleton Lake Watershed Association, several projects were established which the BRWA and the WSGs could collaborate on. Without working cooperatively, none of these projects would have been able to proceed as quickly or as effectively if we had carried them out individually. One of the significant accomplishments this past year was securing an agreement with one of the local

agricultural producers concerning cattle watering. Historically the landowners allowed the cattle to have unrestricted access to a natural water body. The owners have agreed to an alternative watering system that will limit direct access to the creek while providing their livestock with all their daily watering requirements. Although the BRWA already has several projects on the go, we are always looking for new partners to work with. Let us know if you or your group has any water related projects you might like to partner on and we can discuss how we can help each other.

# did you know?

- In 1949, Leduc “Number One” oil well discovery in Central Alberta spawned the province’s early oil rush.
- The first oil sands mine, “The Great Canadian Oil Sands” was started in 1967.
- Natural gas doesn’t have an odour; strong smells are added to it by humans so it can be detected if there are leaks.
- Gases such as carbon dioxide, water vapour and methane that allow incoming sunlight to pass through but absorb heat radiated from the Earth’s surface are called greenhouse gases.
- Oil is one of the ocean’s greatest resources. Nearly one-third of the world’s oil comes from offshore fields in our oceans. Areas most popular for oil drilling are the Arabian Gulf, the North Sea, and the Gulf of Mexico.
- Annually, the amount of garbage that is dumped in the world’s oceans is three times the weight of fish that is caught from the oceans.
- Water loss to evaporation in Alberta’s lakes ranges from 3.9 inches per year in the far northeast corner to 35.1 inches in the southwest corner. In the LICA region the mean is 19.5 inches of water per year lost to evaporation.
- Wetlands are among the most fertile, complex and productive ecosystems on earth. They are also amazing filters for contaminants.
- Groundwater (water below the land surface) moves at different rates depending on the geological material it is traveling through. It can flow as little as a few centimetres in a century or several metres per day.
- Alberta receives more days of sunshine annually than any other province. Annual bright sunshine totals range between 1900 and 2500 hours per year (out of 8760 hours in the year).
- The terms accuracy and precision are often used interchangeably however, they do not mean the same thing. In environmental monitoring, the accuracy of an instrument reflects how close the read is to the “true” value measured. Precision of an instrument is the degree to which repeated measurements under unchanged conditions produce the same results.
- 70% less energy is required to recycle paper compared to making it from raw materials.
- If just 25% of North American families used 10 fewer plastic bags a month, we would save over 2.5 billion bags a year.
- Every ton of paper that is recycled saves 17 trees.
- Every ton of recycled office paper saves 380 gallons of oil.
- It pays to be idle free. The impact of all Canadian drivers reducing 3 minutes of idling a day for a year would be 1.4 million tonnes of carbon dioxide prevented and 630 million litres of fuel saved.
- LICA industry members have reviewed, as a group and individual companies, a variety of actions to reduce light pollution. Examples of initiatives include: directional focused lighting (such as downward), timers on lights, photo electric lights, reflectors and diffusers to minimize night-light glare.
- The highest recorded temperature on Earth was 136°F (58°C) in Libya in 1922. The lowest temperature on Earth was -128.6°F (-89.6°C) in Antarctica in 1983.
- Did you know that Australia has the most arable land in the world, but the water is lacking; Kazakhstan is second, but lacks infrastructure; Canada is third and has both of those essential resources!
- Desertification is devouring more than 20,000 square miles of land worldwide each year.
- The status of the Western Boreal/Prairie populations of the Northern Leopard Frog (*Lithobates pipiens*) is at “Special Concern” up from “Vulnerable” (1990-1999) or “Rare” (prior to 1990).
- Alberta provides a summer home to turkey vultures, a vital part of our ecosystem. The East Central Alberta Vulture studies tag vultures with yellow tags with three black letters (only on the right wing). The ID symbols can be easily read by binoculars or a telescope when the birds are perched or flying over head.

### The ERCB's Question, Complaints, and Objection Process

At the Energy Resources Conservation Board (ERCB), our top priority is our stakeholders. Since 1938 our mission has been to ensure that the discovery, development, and delivery of Alberta's energy resources takes place in a manner that is fair, responsible, and in the public interest.

As part of our commitment to Alberta, the ERCB is continually developing and updating its regulations to ensure all development is done in a safe and responsible manner, and that the environment is protected.

The ERCB understands that some of our stakeholders may have questions, complaints, or even objections to proposed projects in or around their area. The ERCB has a number of services and venues which can address the three items.

In April of 2011, the ERCB and the Government of Alberta launched a toll-free Customer Contact Centre (CCC). This new service acts as a single point for all of Alberta's oil and gas related inquiries. The CCC information line can be reached at 1-855-297-8311.

If your concern or questions are around oil and gas operations activity such as noise, odours, notification of activity, or an emergency, you can contact your local ERCB Field Centre directly. In the LICA region, the ERCB office is the Bonnyville Field Centre: 1-780-826-5352. The ERCB has staff that is on call 24 hours a day, seven days a week.

For those who have concerns around a proposed energy project, the ERCB first suggests discussing the issues with the company. If the issues remain unresolved you may engage the ERCB's Appropriate Dispute Resolution (ADR) program, which assists stakeholders with facilitation and mediation to help resolve concerns. In the LICA region, please call the Bonnyville Field Centre at 1-780-826-5352.

Should you still have concerns you may submit an objection. An objection is a written submission (e.g., e-mail, form, letter, etc.) outlining specific concerns about a company's proposed activities or development. It is important to note, however, that sending an objection to the ERCB does not necessarily mean ERCB processes will be engaged or that a hearing of the application will be held. The

ERCB reviews the nature of the objection and the relevant application to determine whether or not a hearing or other ERCB processes are to be initiated. Objections can be submitted to your local ERCB Field Centre or to:

*Energy Resources Conservation Board  
Applications Branch, Business Operations & Support  
Suite 1000, 250 – 5 Street SW  
Calgary, Alberta T2P 0R4  
Fax: 403-297-7336  
E-mail: BOS.Admin@ercb.ca*

If you are unsure or would like more information, you can visit the ERCB website at [www.ercb.ca](http://www.ercb.ca).

There you will find a series of helpful documents called EnerFAQs, which are found under the "Public Zone" section of our website. These documents are written in a frequently asked question format and deal with a variety of subjects that relate to ERCB processes - including ADR and objections - as well as important oil and gas issues.

Community and Aboriginal Relations advisors, who are located at all ERCB offices, can also provide assistance in answering your questions or helping you access our services.

## Synergy Alberta

What do you get when you put a bunch of landowners, a bunch of oilfield folks, a lot of government regulators, and sundry other people into a great big room together? Well, if it's Synergy Alberta (SA), you get great discussions, a positive will to move forward to successful solutions, and lots of questions - and answers! Synergy Alberta is a provincial organization set up to provide information and support for those interested in working collaboratively to resolve issues, lessen impacts, and encourage the use of best practices in resource development. Synergy groups can become members; all others can become Friends of Synergy. Synergy's message of connection and cooperation is even reaching into British Columbia and Nova Scotia.

In addition to a great website that provides tools and resources and web hosting for member groups, SA provides help and information for forming a synergy group, as well as an exciting annual conference with speakers and sessions from across the entire spectrum of resource development and sustainability, and the chance to connect with people from all over.

Look for the announcement of the place and date for October's conference on our website at: <http://synergyalberta.ca>.



Synergy Alberta's Gary Redmond presents Iris English and Delano Tolley, representing LICA, with an Award of Excellence at the 2011 conference.



# FINANCIAL statements



## REVIEW ENGAGEMENT REPORT

To the Members of:  
Lakeland Industry & Community Association  
Bonnyville, Alberta

We have reviewed the statement of financial position of the Lakeland Industry & Community Association as at December 31, 2011 and the statement of operations, statement of changes in net assets and the statement of cash flows for the year then ended. Our review was made in accordance with generally accepted standards for review engagements and accordingly consisted of enquiry, analytical procedures, and discussion related to information supplied to us by the association.

A review does not constitute an audit and consequently we do not express an audit opinion on these financial statements. Based on our review, nothing has come to our attention that causes us to believe that these financial statements are not, in all material respects, in accordance with the basis of accounting disclosed in the notes to financial statements.

*Merwin Tay LLP*

PROFESSIONAL ACCOUNTANTS

Bonnyville, Alberta  
February 24, 2012



# financial statements

## STATEMENT OF OPERATIONS

For the year ended December 31, 2011 (Unaudited)

REVENUE	2011	2010
<b>Operating</b>		
Memberships	47,000	54,000
Other receipts from members	839,420	935,138
Grants	170,587	120,735
Alberta Environment contract income	68,750	157,500
Interest	4,910	2,519
Total Operating	1,130,667	1,269,892
<b>Programs</b>		
Airshed	140,623	342,304
Watershed	139,573	213,822
Total Programs	280,196	556,126
<b>Total Revenue</b>	<b>1,410,863</b>	<b>1,826,018</b>

EXPENDITURES	2011	2010
<b>Operating</b>		
Airshed	366,604	400,335
Amortization	87,958	72,621
Annual Report costs	30,840	30,433
Board & committee	50,100	53,100
Contracted services	205,211	171,613
Insurance	7,706	7,241
Meetings	14,507	14,972
Occupancy costs	47,420	47,954
Office	17,972	16,825
Professional fees	3,460	4,014
Property taxes	3,260	3,511
Public relations	24,695	35,624
Training & development	4,468	4,929
Travel	26,401	19,994
Wages & employee benefits	159,882	141,181
Total Operating	1,050,484	1,024,347
<b>Programs</b>		
Airshed costs	133,953	101,233
Watershed costs	217,811	268,580
Total Programs	351,764	369,813
<b>Total Expenditures</b>	<b>1,402,248</b>	<b>1,394,160</b>
Gain (loss) on disposal of assets	-	(155)
Excess of revenue over expenditures	8,615	431,703
Unrestricted assets (beginning of year)	1,196,192	764,489
Unrestricted assets (end of year)	1,204,807	1,196,192

## Industry Members & Funding Partners



Canadian Natural Resources Ltd.  
Bag 1003  
Bonnyville, AB T9N 2J7  
Shawn Brockhoff: 780.826.8124



Cenovus Energy  
Bag 1015, Foster Creek  
Bonnyville, AB T9N 2J7  
Wayne Bamber: 780.573.7350



Devon Canada Corporation  
Box 7905, 6210 - 50 Avenue  
Bonnyville, AB T9N 2J2  
Kevin Ryan: 780.812.2665



Imperial Oil Resources Ltd.  
Box 1020  
Bonnyville, AB T9N 2J7  
Paul Leonard: 780.639.5117  
Chelsie Klassen: 780.639.5194



Husky Energy  
Box 6098  
Bonnyville, AB T9N 2G7  
Alan Drew-Brook: 780.639.5010  
Monty Moore: 780.639.5024



Shell Canada Energy  
Box 8098  
Cold Lake, AB T9M 1N1  
Grant Zellweger: 780.639.1501  
Kathleen Zellweger: 780.639.1510

# MEMBERS

## Industry Members



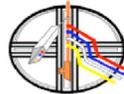
### Interpipeline

Inter Pipeline Fund  
Box 7189  
Bonnyville, AB T9N 2H5  
Allen Brundige: 780.826.3620



Pengrowth Corporation  
2100, 222 Third Avenue S.W.  
Calgary, AB T2P 0B4  
Doug Willy: 403.269.5023  
Steve De Maio: 403.233.0224

## Associate Members



Frog Lake Energy Corporation  
1050, 340 - 12 Avenue  
Calgary, AB T2R 1L5  
Gil Hegel: 403.265.2263



Koch Exploration Canada  
1500, 111 - 5 Avenue SW  
Calgary, AB T2P 3Y6  
Jennifer Bordyniuk: 403.716.7701



OSUM Oil Sands Corporation  
Suite 1900, 255 - 5 Avenue  
Calgary, AB T2P 3G6  
Brad Braun: 403.270.4761  
Heather Harms: 780.812.8011



R11 North America Inc.  
Suite 500, 777 - 8 Avenue  
Calgary, AB T2P 3R5  
Jeffrey Schneider: 403.767.2014

## Government Members



Municipal District of Bonnyville  
4905 - 50 Avenue, Bag 1010  
Bonnyville, AB T9N 2J7  
Ryan Poole: 780.826.3171



Town of Bonnyville  
4917 - 49 Avenue, Bag 1006  
Bonnyville, AB T9N 2J7  
Mark Power: 780.826.4806

Utility Emergencies \_\_\_\_\_

ATCO Electric (General Inquiries)	1.800.668.2248
ATCO Electric (24 Hour)	1.800.668.5506
Alta Gas, Bonnyville (General)	1.866.222.2067
Alta Gas, Bonnyville (24 Hour)	1.866.222.2068
EPCOR	1.800.667.2345
Northeast Gas Co-op, Bonnyville	780.826.4002
Buried Utilities Locations	1.800.242.3447

Energy Resources Conservation Board (ERCB) \_\_\_\_\_

Bonnyville Field Centre (24 Hour)	780.826.5352
Customer Contact Centre	1.855.297.8311



Government of Alberta \_\_\_\_\_

Service Alberta (Toll-Free)	310.0000
Registrar of Land Agents	780.415.4600
Surface Rights Board	780.427.2444
Land Compensation Board	780.427.2444
Genia Leskiw, MLA	780.826.5658
Ray Danyluk, MLA	780.645.6999

Alberta Environment & Water \_\_\_\_\_

Emergency, Spills & Complaints	1.800.222.6514
General Inquiries (North Region)	780.427.7617

Alberta Agriculture, Food & Rural Development \_\_\_\_\_

General Inquiries	310.FARM (3276)
The Farmer's Advocate	310.FARM (3276)

Alberta Human Resources & Employment \_\_\_\_\_

Workplace Health & Safety	1.866.415.8690
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Alberta Infrastructure & Transportation \_\_\_\_\_

Transportation of Dangerous Goods Emergencies	1.800.272.9600
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Alberta Health Services \_\_\_\_\_

Westlock Office	780.349.8705
Camrose Office	780.608.8800

Alberta Sustainable Resource Development \_\_\_\_\_

Fish and Wildlife Division	
Bonnyville	780.826.3142
Cold Lake	780.594.7876
St. Paul	780.645.6313
Public Lands Division	
Bonnyville	780.826.4297
St. Paul	780.645.6336
Report-A-Poacher	1.800.642.3800
Report a Forest Fire	310.FIRE (3473)

Government of Canada \_\_\_\_\_

Environment Canada (Prairie & Northern Office)	
General Inquiries	780.951.8600
Severe Weather Reporting	1.800.239.0484

Brian Storseth, MP	1.800.667.8450
National Energy Board	1.800.899.1265



key  
CONTACTS

**Abandoned Well** - A well that is permanently shut-in where the casing has been cut sub-surface and capped with a metal plate.

**Abandonment** - A procedure that leaves a drilled well in a condition that can be left indefinitely without further attention and will not damage freshwater supplies, potential petroleum reservoirs or the environment.

**Acid Deposition** - A broad term for the different ways acidifying compounds precipitate from the atmosphere and deposit onto surfaces. Includes acid rain, fog, snow, and dry deposition of acidic particles (also known as aerosols).

**Alberta Ambient Air Quality Objectives (AAAQO)** - Are established by Alberta Environment to define desired environmental quality that will protect public health and ecosystems. Some of the factors considered are; sensitivity of receptors, substance behavior in the atmosphere, natural levels and fluctuations, pollution control, and monitoring technology. AAAQOs are used to assess compliance and evaluate the performance of industrial facilities, which must be designed to meet AAAQOs.

**Aquifer** - An underground formation of permeable rock or loose material which can produce useful quantities of water. It is not an underground river, but water generally moves slowly through the ground, travelling from metres per day to centimetres per century. Aquifers also vary in size, from being able to supply a single household to being able to supply the water needs of a town, city or region.

**Artesian Well** - A well that penetrates a confined aquifer. The water level in these wells rises above the upper surface of the aquifer due to the pressure in the confined aquifer. If the pressure is great enough, the well will overflow.

**Background Concentration** - The concentration of a chemical substance in an area considered to be relatively unaffected by industry or other human activity. Background often refers to naturally occurring or uncontaminated levels. Background concentrations may vary by region.

**Barrel** - The common unit of measuring petroleum. One barrel contains approximately 159 litres.

**Battery** - Equipment to process or store crude oil from one or more wells.

# industryTERMS

**BTEX (Benzene, Toluene, Ethylbenzene and Xylene)** - Light aromatic hydrocarbons are some of the volatile organic compounds (VOCs) found in petroleum derivatives such as gasoline. It is a component of car exhaust and can be emitted from oil and gas facilities. Benzene is a known carcinogen and is an occupational and public health concern. The compounds toluene, ethylbenzene, and xylenes have harmful effects on the central nervous system.

**Biodiversity** - The variety and abundance of species (i.e. plants and animals) and the natural communities, ecosystems and landscapes in which they occur.

**Bitumen** - A naturally occurring viscous mixture, mainly of hydrocarbons heavier than pentane that may contain sulphur compounds and that in its naturally occurring viscous state will not flow to a well without being heated or diluted.

**Blow-Out** - An uncontrolled flow of gas, oil or other fluids from a well.

**Brackish Water** - Saline, non-potable water that is poorly suited for domestic or agricultural purposes and is typically located below the bedrock.

**Cogeneration** - A highly efficient energy system that produces both electricity and heat from one energy source.

**Cold Flow or Primary Recovery** - The production of oil reservoirs using the natural energy available in the reservoirs and pumping techniques.

**Consensus Decision Making** - A process for group decision-making. An entire group of people can come to an agreement where the input and ideas of all participants are gathered to arrive at a final decision that is acceptable to all.

**Cyclic Steam Stimulation (CSS)** - A method of producing heavy oil which involves injecting steam to heat and soften the heavy oil and producing the heavy oil from the same wellbore used to inject the steam.

**Diluent/Condensate** - Light petroleum liquids used to dilute bitumen and heavy oil so they can flow through a pipeline.

**Directional (slant) Well** - A well drilled at an angle from the vertical by using a slanted drilling rig; may be used to drill multiple wells from a common drilling pad or to reach a subsurface location beneath land where drilling cannot be done.

**Ecosystem** - A natural unit consisting of all plants, animals and micro organisms in an area functioning together with all the non-living physical factors of the environment.

**Environmental Impact Assessment (EIA)** - An assessment of the possible positive or negative impacts that a proposed project may have on the environment, together consisting of environmental, social and economic aspects.

**Enhanced Oil Recovery (EOR)** - Any method that increases oil production by using techniques or materials that are not part of normal pressure maintenance. (eg: steam can be injected into a reservoir to enhance or increase oil production).

**Fracturing / Fracking** - The practice of pumping special fluids down the well under high pressure; fracturing causes the formation to crack open, creating passages for the reservoir fluids to flow more easily into the wellbore.

**Horizontal Well** - Drilling a well that deviates from vertical and travels horizontally, generally through a producing formation.

**Hydrogen Sulphide/ Reduced Sulphur Compounds (RSC)** - Hydrogen Sulphide (H<sub>2</sub>S) is a highly toxic,

naturally occurring, reduced sulphur compound. It has the odour of rotten eggs. Other highly odourous reduced sulphur compounds include: mercaptans, dimethyl sulphide and dimethyl disulphide. Industrial sources include natural gas plants, petrochemical plants, sewage treatment facilities, pulp and paper plants and confined feeding operations. Natural sources of H<sub>2</sub>S include sulphur hot springs, sloughs, swamps and lakes.

**In-Situ** - Using drilling technology, steam is injected into the deposit to heat the oil sand lowering the viscosity of the bitumen. The hot bitumen migrates towards producing wells, bringing it to the surface, while the sand is left in place ("in situ" is Latin for "in place"). Steam Assisted Gravity Drainage (SAGD) is a type of in situ technology that uses innovation in horizontal drilling to produce bitumen.

**Landspraying** - Either spraying drilling waste onto cultivated land and cultivating to mix the waste with the soil or spraying onto vegetated land and not incorporating it. The ERCB regulates this activity.

**Multi-well Pad** - Consolidating wells to groups on a single pad and then drilling in a variety of directions to reach reservoirs - some previously inaccessible.

**Nitrogen Dioxide** - A toxic, pungent reddish-brown gas. Formed by the reaction of atmospheric ozone with the nitric oxide produced from combustion.

**Ozone** - A strong oxidizer with a sweet smell. Can be transported from the upper atmosphere or produced by the reaction of oxides of nitrogen with volatile organic compounds.

**Respirable Particulate Matter (PM 2.5)** - Airborne particles in solid or liquid form with median diameter less than 2.5 micrometers. Sources include construction, agriculture, combustion, forest fires or the reactions of other pollutants.

**Steam Assisted Gravity Drainage (SAGD)** - An advanced form of steam stimulation in which a pair of horizontal wells are drilled into the reservoir, one a few metres above the other. High pressure steam is continuously injected into the upper wellbore to heat the oil and reduce its viscosity, causing the heated oil to drain into the lower wellbore, where it is pumped out.

**Shut-In Well** - A well that is closed off to stop production (or prevent flow).

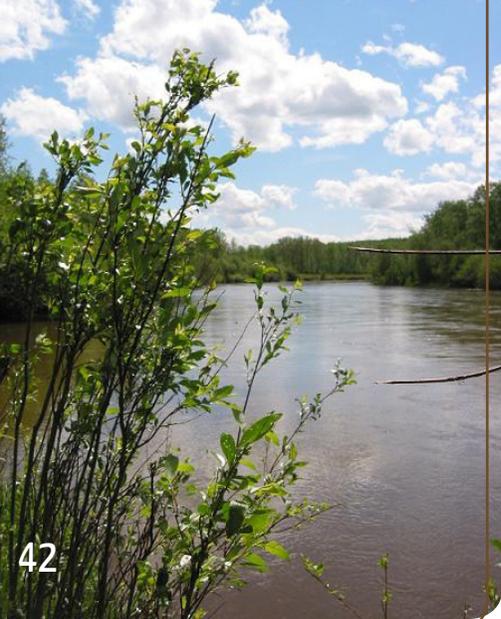
**Sulphur Dioxide** - A toxic, colorless gas with a pungent odor. Primarily formed by combustion processes of flaring of gas containing Sulphur compounds.

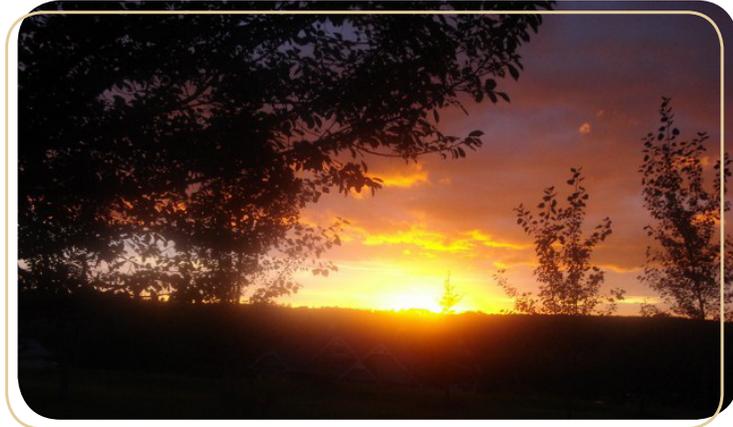
**Suspended Well** - A well site that for economic, environmental or other reasons is not viable and is not operating but may operate in the future.

**Total Hydrocarbons** - A family of chemicals containing carbon and hydrogen. Sources include vegetation, petroleum and chemical industries, dry cleaning, fireplaces, natural gas combustion, and aircraft traffic. Vehicles are the major source of hydrocarbons in urban locations.

**Total Reduced Sulphur** - Includes hydrogen sulphide, mercaptans, dimethyl sulphide, dimethyl disulphide and other sulphur compounds, but does not include dioxide. Potential sources are as listed for H<sub>2</sub>S

# 2010 photo contest entries





# MEMBERSHIP & volunteer form

## INDIVIDUAL, PROVINCIAL & FEDERAL GOVERNMENT, FIRST NATION, MÉTIS, NGO's: (NO COST)

**MUNICIPAL GOVERNMENT:** Population up to 5,000: \$250  
 Population of 5,001 – 10,000: \$500  
 Population over 10,000: \$750

\*Municipal Government fees based on most recent available Statistics Canada population figures.

**CORPORATE:**  Corporate I (more than 50 employees): \$5,000.00  
 Corporate II (fewer than 50 employees): \$2,000.00  
 Corporate III (fewer than 20 employees): \$1,000.00

Name: \_\_\_\_\_ Organization: \_\_\_\_\_  
 (if applicable)

## OPPORTUNITIES FOR PARTICIPATION:

Please check the committee(s) that you would like to become a member of & complete the other side of this form.  
 For more details contact the LICA office.

- |   |  |
|---|--|
| <input type="checkbox"/> Education & Information Committee      | <input type="checkbox"/> Governance Committee  |
| <input type="checkbox"/> Resolution Committee ( <i>Ad Hoc</i> ) | <input type="checkbox"/> Airshed Zone  |
| <input type="checkbox"/> Beaver River Watershed Alliance        | <input type="checkbox"/> I support this organization but I am not interested in being on a Committee at this time. |

## VOLUNTEER OPPORTUNITIES:

Please check the volunteer opportunities that you may be interested in participating in:

- Air Quality Monitoring    Education Programs    Lakewatch Program    Event Hosting  
 TD Great Canadian Shoreline Clean Up    Attend a Meeting

## I AM INTERESTED IN RECEIVING INFORMATION FROM LICA REGARDING THE FOLLOWING:

- Meetings    Open Houses    Email Updates  
 Newsletters    Annual Report    Other \_\_\_\_\_

**Vision:** Lakeland Industry & Community Association is a balanced partnership actively supporting a sustainable environment.

**Mission:** LICA supports the environment by gathering, sharing and acting on information regarding development in our region.

**Values:** • Trust • Respect • Honesty • Integrity • Equality • Cooperation • Transparency  
 • Accountability • Open-Mindedness • Responsibility • Supportiveness • Participation

## I AM INTERESTED IN THE COMMITTEE(S) AS SHOWN ON PART ONE OF THIS FORM.

1. My interest in the selected committee(s) is:

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2. I bring the following to the committee table (e.g.: state your related experience, general interest, etc.)

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3. I believe that LICA should focus on the following for the next 2 to 5 years:

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4. I am available to attend meetings during the :    Daytime    Evening

\_\_\_\_\_  
 Name (Please Print)

\_\_\_\_\_  
 Address

\_\_\_\_\_  
 Phone number

\_\_\_\_\_  
 Email

\_\_\_\_\_  
 Signature

\_\_\_\_\_  
 Date

Completed forms can be submitted to LICA at:  
 Lakeland Industry & Community Association  
 Box 8237, Bonnyville, AB T9N 2J5

Or via fax / email:  
 Fax: 780.812.2186  
 E: lica2@lica.ca

[www.lica.ca](http://www.lica.ca)

Lakeland Industry & Community Association

5107 W - 50 Street, Box 8237

Bonnyville, Alberta T9N 2J5

Phone: 780.812.2182

Toll Free: 1.877.737.2182

Fax: 780.812.2186

Open Monday - Thursday

9 a.m. - 3 p.m.