

# SiteLine

## Joffre Site Community News

Published for the Central Alberta community by NOVA Chemicals

Volume 28, Number 3 **September 2017**

### Special Edition: Annual Environment Review

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Joffre Community Advisory Panel

*Celebrating 35 years of  
working together*

See page 7

## Looking back at a decade of environmental performance data

This is our **16th annual report to our community** on our environmental performance and goals for continuous improvement at the Joffre Site.

As you are aware from previous newsletters and our Spring Open House discussions, this year we are preparing our **Applications for Renewal for our Operating Approval and our Waterworks System Approval** — both of which expire in 2019. With this in mind, we have **expanded this year's environment report** to include an overview of our site's environmental performance in key areas since the last renewal (2006 to 2016). This is an important component of our Operating Approval renewal application and we wanted to share the content with you so we can discuss it at our October 11 Open House (see invitation page 8).

In this and previous reports, we have proactively shared with you our performance with respect to water resource management, air quality, greenhouse gas emissions intensity reductions and other community areas of interest such as noise and light management. Next year, we will be including Polyethylene 1 (PE1) Expansion data as operations only began earlier this year.

As I review our performance over the past decade, I am reminded of our commitment to transparency and ongoing efforts to continuously improve, even as we increased production and added facilities. I am confident we will continue these focused efforts over the long term. Here are some highlights of our commitment to get better:

- **Meeting all regulatory requirements** and ensuring emissions are below all regulatory compliance limits;

- **Meeting our commitment to Responsible Care® and Sustainability** in our daily operations as well as our future growth;
- **Harnessing innovation, operational excellence and environmental stewardship** to help us continuously improve our performance;
- **Investing consistently and significantly into our facilities** (more than \$2 billion in the past decade) thus providing us an opportunity to proactively incorporate **energy efficiency and environmental performance improvements**; and
- **Continuing to engage our community and stakeholders** by seeking input into our operations and plans, and making a concerted effort to understand and respond to concerns and opportunities.

This year, we are marking **35 years of working together with a community advisory group**. The original FARM-AGE group started meeting in 1982 — shortly after our operations started at the site. Today, the Joffre Community Advisory Panel (JCAP) continues to foster ongoing positive working relationships with industry, neighbours and the surrounding community. Thank you to all of the community representatives through the years for their willingness to work with us in our **goal of being a socially responsible neighbour**.

We invite you to review this environment report and join us at the Fall Open House to discuss any aspect of our performance or our operations. We look forward to seeing you there!

**Rick Van Hemmen**, Joffre Site Leader

# About our environment report and our approach to Responsible Care

***We are committed to minimizing our impact on the environment because it is the right thing to do and is key to the sustainability of our business.***

This annual *SiteLine* environment report provides our community and stakeholders with an overview of our performance in the important areas of water, air, GHG emissions and noise management. As we are currently preparing our Applications for Renewal for our Operating Approval and our Waterworks System Approval — both of which expire in 2019 — we have expanded this year's environment report to include an overview of our site's environmental performance in key areas since the last renewal (2006 to 2016).

NOVA Chemicals continues to play a leadership role in the development of our industry's Responsible Care ethic and its sustainability principles. Our culture is built on the ethics and standards of Responsible Care.

Responsible Care, developed by the Chemistry Industry Association of Canada (CIAC), is the chemistry industry's approach to addressing stakeholder concerns about the potential effects of chemicals and chemical facilities on human health and the environment.

Our Taking Care model, shown to the right, frames our approach to putting Responsible Care into practice. It provides the “umbrella” for our corporate-wide Environmental Plan, and the Joffre Site environmental management system and programs.

We remain focused on meeting all regulatory requirements and ensuring emissions are below all regulatory compliance limits. We strive for continuous improvement in our performance.

## Taking Care

Our work at NOVA Chemicals results in plastic products that take care of food, water and other goods vital to life. To enable these products, we must first take care of the people, places, materials and processes that make them possible. We take care with respect to our operations, communities, products and the environment. Taking Care is a way to think and a way to work. It's our particular approach for putting Responsible Care® into practice.



### Operations

In our operations, we take care to attract and develop talented people committed to the safety and well-being of themselves and others. We foster relationships that promote community safety and other social and environmental values.



### Communities

In our communities, we take care to be a neighbor that promotes conversation, understanding and involvement. We contribute positively to community development, public policy and reporting.



### Products

In our products and those we enable, we innovate to improve people's lives. We take care to promote the safety, security and value of products throughout their life cycle.



### Environment

In our environment, we take care to conserve, protect and enhance natural resources. Through innovation, operational excellence and environmental stewardship, we seek to protect life and to continuously improve our environmental performance.

## Data for expanded Polyethylene 1 (PE1) facility

Our expanded PE1 facility began operations earlier this year. We will be including 2017 data from this additional facility in next year's environment report. Next year's report will compare actual performance from the expanded facility against the performance forecast we provided for these operations.

The forecast of performance was based on modeling conducted for this project's environmental studies. See last year's *SiteLine* environment report for details: <http://www.novachem.com/Pages/joffre/joffre-news.aspx>.

## Now available: NOVA Chemicals' 2016 Sustainability Report

Our 2016 report reflects our commitment to shaping a world where products vital to human health and happiness are even better tomorrow than they are today.

We invite you to review the report — both a snapshot of current company-wide performance and a commitment toward continual improvement — at [www.novachemicals.com](http://www.novachemicals.com).



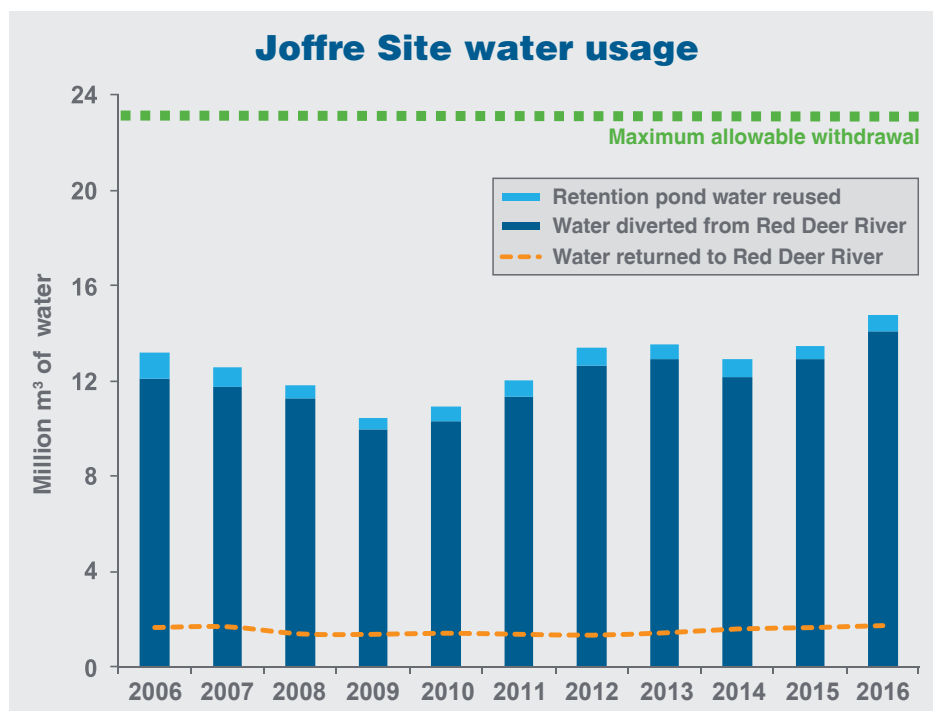
## Minimizing our impact on water resources

Water is critical to Joffre Site operations and our management programs focus on minimizing our impact on this valuable resource.

The Red Deer River has an annual flow of roughly two billion cubic metres (m<sup>3</sup>). NOVA Chemicals has water licences for approximately 23 million m<sup>3</sup> per year, which is just over 1% of the annual flow in the river.

In 2016, we withdrew almost 14.1 million m<sup>3</sup> or 62% of our allotment from the river. We also collected and used 0.65 million m<sup>3</sup> from surface run-off.

The majority of water used in our manufacturing facilities is returned to the environment through evaporation in cooling tower plumes. The amount of water vapour released back to the ecosystem is about 80% of our intake. Water returned to the river goes through extensive testing to meet regulatory requirements and strict environmental standards before discharge.



*This graph shows our 11-year water use at the Joffre Site. Generally, the greater the production rate, the greater our water use.*

## Commissioning of new stormwater retention pond

Construction of the new stormwater retention pond located just east of the existing pond is nearing completion, with commissioning scheduled for October.

The new pond incorporates best practices and will help the site more effectively capture run-off from major storm events. This water, once it is softened and clarified, is normally reused in our operations.

Once the new pond is operational, we will be able to remediate the existing pond using a staged *in-situ* approach to reduce the potential for issues such as odour. The existing pond has been in operation for many years and there is some contamination contained within the sediment from historical spills dating back to the early 1980s.

The first phase in the remediation program will be a soils investigation. Samples of the sediment will be obtained and submitted for analytical analyses. We expect to do this work during freeze-up in 2017. Based on the findings of the soils investigation, a detailed remediation plan will be developed. The remediation of the retention pond is scheduled to begin Fall 2018.



*The new pond incorporates best practices and will help the site more effectively capture run-off from major storm events.*



## Cleaning up our river banks

Twice a year our volunteers join hundreds of community participants to help clean up the banks of the Red Deer River. The Spring clean-up netted 65 bags of trash including everything from tires to briefcases. 4H youth helped cook and serve the lunch we sponsored. We also took part in the national initiative, the Great Canadian Shoreline Clean-up on September 10.

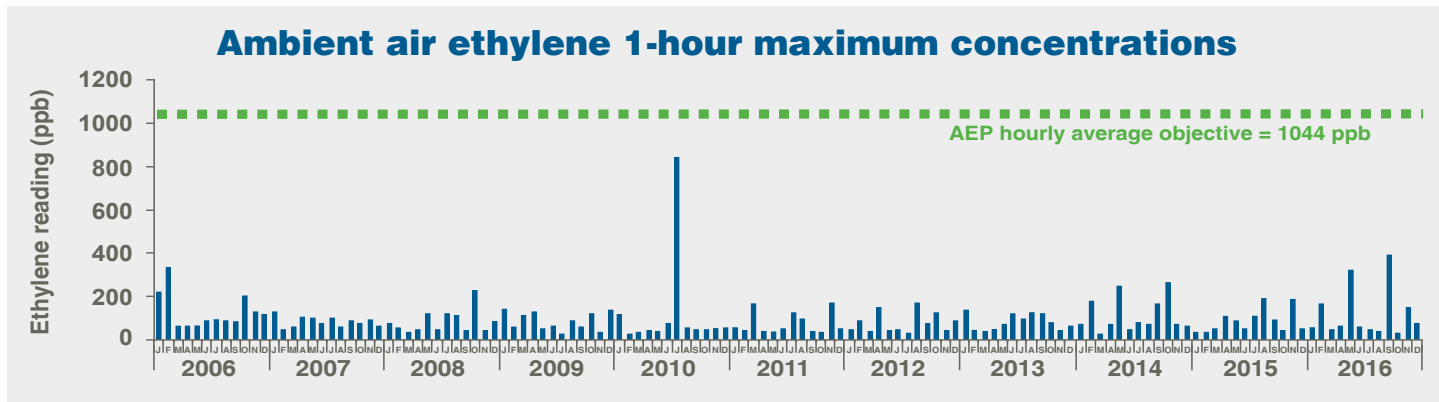


## Ensuring air emissions meet Alberta quality objectives

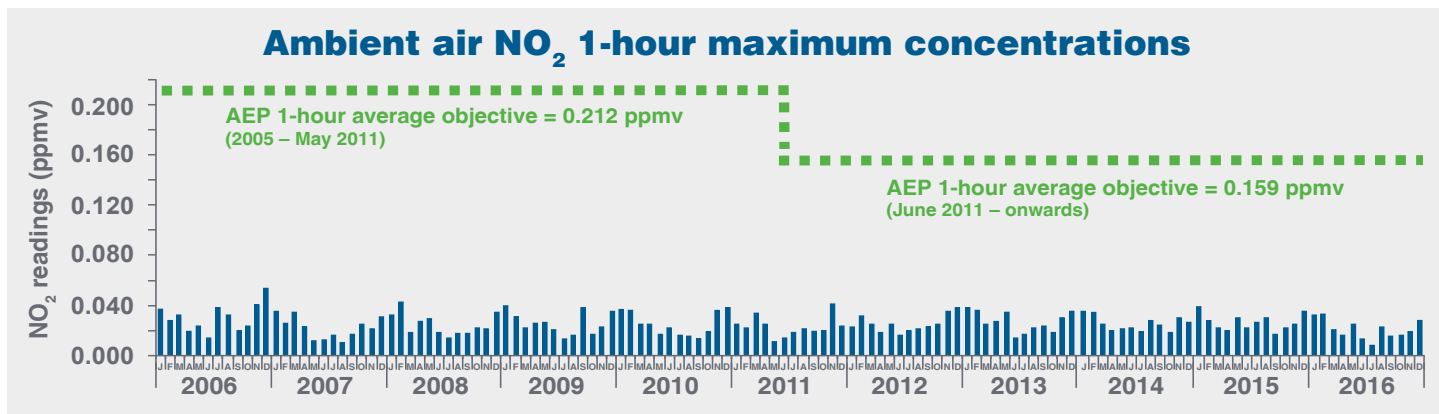
Air quality management is a priority for NOVA Chemicals. Through the Joffre Site Air Emissions Management Program we strive to reduce emissions, monitor impacts and continuously review our performance. We remain focused on ensuring air emissions are below all regulatory compliance limits and air quality objectives set out by Alberta Environment and Parks (AEP).

Data related to a variety of air quality parameters, as shown in the graphs below and on page 5, indicates our concentrations and readings are consistently below established guidelines.

In addition to the ambient monitoring data, we have completed air dispersion modelling using approval limits to confirm we can continue to operate under air quality objectives at full production rates.



Ambient ethylene (1-hour maximum) concentrations are well below the AEP Hourly Average Objective of 1,044 parts per billion (ppb). (The spike in 2010 was the result of a leak in an INEOS LAO facility exchanger, which was promptly repaired with no adverse environmental impacts indicated through ongoing atmospheric monitoring.)



Concentrations of oxides of nitrogen (specifically NO<sub>2</sub>) are consistently below regulatory limits.

Our NO<sub>x</sub> Emissions Reduction Steering Team determines strategies for Joffre Site NO<sub>x</sub> emissions reductions activities. The team includes site leaders, technical experts and Responsible Care environmental specialists. Some of the focus areas of the team include tracking NO<sub>x</sub> emissions performance, reviewing impacts and opportunities of site projects and interfacing with regional groups such as the Parkland Airshed Management Zone.

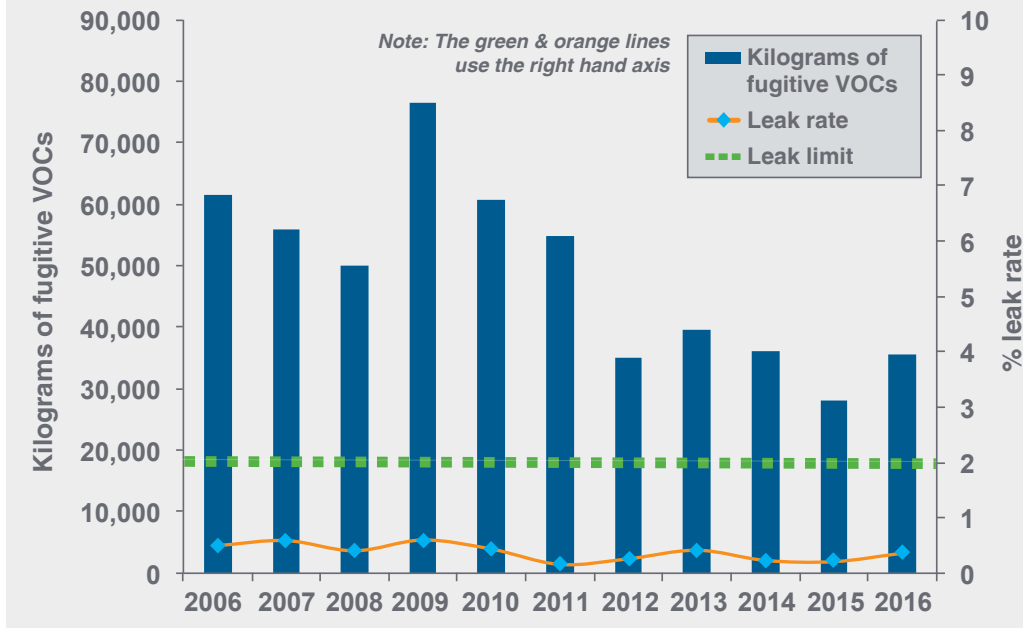
We expect the ongoing E2 Furnace Refurbishment Project (see page 5) to help offset emissions as a result of furnace design improvements and we are also evaluating where we can make more improvements.

## Youth sweep the ditches

This Spring we supported nearly 100 young people from six youth groups who cleaned 18 km of ditches around our Joffre Site as part of our Adopt-A-Highway commitment. We also supported Parkland Trek youth who swept the ditches of Highway 815. We appreciate their ongoing commitment to Taking Care!



## Petrochemical facility fugitive VOCs



Volatile organic compounds (VOCs) emissions are hydrocarbons that can affect air quality. Our site's comprehensive Leak Detection and Repair (LDAR) program is fully implemented according to the Canadian Council of Ministers of the Environment Code of Practice. While the Code states that leaks over 10,000 parts per million (ppm) must be repaired, we schedule prompt maintenance for any leak over 1,000 ppm.

## Update on E2 Furnace Refurbishment Project

To help meet the PE1 expansion ethylene needs and to help maintain Ethylene 2 (E2) plant operating capacity at design levels, the \$350-million Phase 1 E2 Furnace Refurbishment Project to upgrade and modernize five of 11 furnaces was started in 2014.



Phase 1 continues to progress as refurbishment of four furnaces is complete. This phase, including start-up of the fifth furnace, should be complete by January 2018. About 200 trade workers are on site.

We continue the development of Phase 2 which will focus on refurbishment of four of the remaining six furnaces. Phase 2 is expected to include a capital investment of approximately \$270 million.

A number of environmental benefits are expected from both phases of this project:

- The refurbishment includes replacing the convection section of the furnaces and the burner systems with new fuel and combustion air and burner management systems.
- The new burners will utilize best available technology (e.g. next generation low NO<sub>x</sub> burners).
- Improvements in design are expected to result in reductions in NO<sub>x</sub> emissions. Collectively, the improvements could result in a 30% to 40% reduction in NO<sub>x</sub> emissions from each furnace stack annually. Phase 1 confirmatory stack tests to date have demonstrated expected reductions in NO<sub>x</sub> levels.
- We also expect improvement in efficiency which would result in some greenhouse gas (GHG) emissions reductions. This improvement has also been demonstrated on Phase 1 furnace tests.

## A look at air quality monitoring at the Joffre Site

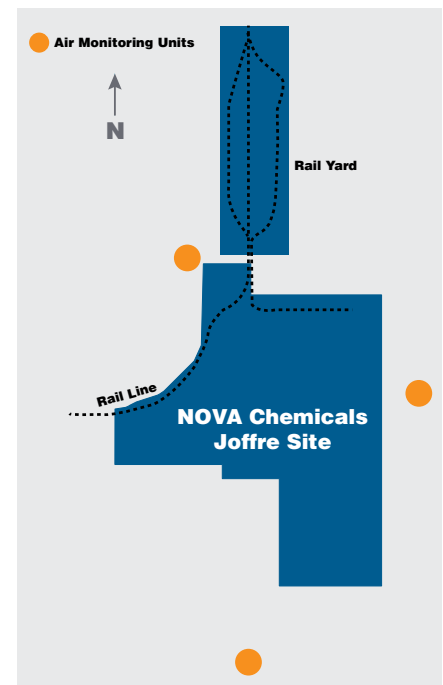
This diagram identifies the three permanent fenceline air monitoring stations at the Joffre Site. These stations monitor concentrations of emissions like ethylene, methane, non-methane hydrocarbons, oxides of nitrogen and ozone. They also track wind speed and direction.

We are proposing to remove an existing fourth station (located inside the fence line at the southern end of the site) with analyzers from that unit incorporated into the south fence line station.

Monitoring stations are located outside the site's fence line in locations where maximum ground level concentrations are predicted to occur.

Air quality information is reported to regulatory bodies. AEP has ambient air quality guidelines for oxides of nitrogen, ethylene and ozone.

We remain focused on ensuring air emissions are below all regulatory compliance limits and that Alberta air quality objectives are met.





## Continued reduction in GHG emissions intensity

In 2016, we continued to reduce our GHG footprint. NOVA Chemicals Joffre Site has achieved nearly a 4% reduction in our GHG emissions intensity as compared to the average emissions intensity established during the baseline period of 2003 to 2005.

As of January 1, 2017, there is an Alberta regulatory requirement for large industrial facilities to reduce their emissions by 20% when compared against the three-year baseline period. When facilities are not able to achieve the provincial compliance obligation, GHG offset markets, as well as technology funds that contribute to research and development opportunities, are critical tools to help meet compliance. The carbon price set by the technology fund is \$30 per tonne as of January 1, 2017.

Offsets are based on reductions of GHG emissions by parties who are not regulated, such as agricultural producers. The offsets we have purchased for our Joffre Site support the building of organic carbon in soil through low and zero-tillage practices and assist the agricultural community in advancing sustainable practices. In March 2017, the Alberta Climate Change Office (ACCO) made a policy announcement that

limits the use of offsets to 30%, which had impacts on the offset market in the province. For 2016 compliance, we used a combination of offsets and we also purchased compliance units from the Climate Change Emissions Management Fund (CCEMF) to meet the obligations for the Joffre Site. These funds are invested into Alberta projects that will help to reduce GHG emissions.

Federal and Provincial governments are continuing to add and update regulations related to GHG emissions. The Joffre Site will be subject to the *Specified Gas Emitters Regulation* (SGER) until the end of 2017 when Alberta will transition to an Output-Based Allocation (OBA) approach for large industrial emitters. The new regulation is expected to move away from a facility baseline intensity-based calculation and will instead focus on emissions related to each product produced.

We are committed to continuously improve our manufacturing, energy and fuel efficiency in order to reduce the intensity of GHGs per tonne of product produced.

## 20 years of tree planting

For the 20th consecutive year, Joffre Site employees and their families participated in the annual Red Deer Urban Forestry Project. The 31 enthusiastic volunteers planted 1,710 tree seedlings in the green space north of Maskepetoon Park. This brings our 20-year total to over 11,500 trees planted in the Red Deer area. All of the trees and seedlings benefit air quality, biodiversity and habitat for wildlife corridors within The City of Red Deer.



## Great turnout for annual August event

More than 65 neighbours came out for our annual Emergency Preparedness Awareness BBQ on August 17. Tours of our emergency equipment, information booths, kids' events and an opportunity to validate emergency response contact information were part of the evening.

## Educational pollinator trail under construction at our Nature Trail

We are constantly looking at ways to enhance the visitor experience and the wildlife habitat potential at the NOVA Chemicals Community Nature Trail. Even during the construction of the trail several years ago, we received community input on the possibility of attracting bees to the area.



*This bumble bee on fireweed is an example of the many pollinators the new trail at the NOVA Chemicals Community Nature Trail may attract.*

Now under construction is an educational pollinator trail designed to raise awareness and provide an educational opportunity for our visitors. The mini trail is looped off the east side of the main west trail system and will eventually house eight to 10 plant species increasing the floral resources for pollinators. We're also excited about the inclusion of a pollinator hotel. To help visitors enjoy the hotel activity, we are installing a bench commemorating JCAP's 35th anniversary (see below).

We have engaged a specialist for this project. Phase one (construction of the mini trail) is scheduled for completion this Fall. Phase Two (planting and identifier sign installation) will follow in Spring 2018.

Alberta native pollinators include bees, butterflies, wasps, moths, flies, beetles and hummingbirds. Trails such as the one we are constructing can help enhance local pollinator populations by increasing sources of nectar and pollen and providing a favourable habitat.

A recent survey conducted on behalf of Friends of the Earth Canada suggests nearly seven in 10 Canadians are concerned or very concerned about the loss of the bee population.

## PE1 expansion noise sources validated

Our noise management strategy is constantly being updated and adapted to reflect site changes. The overall goal, however remains the same: to mitigate site operating noise impacts on our neighbours.

With the completion and commissioning of the PE1 Expansion Project earlier this year, we have validated noise sources. Modeling indicates that there are a few new sources in the expansion that have higher noise results than estimated prior to construction. However, predicted sound levels including background noise at residence locations show only a slight increase in noise levels that would not be an audible change. We are currently evaluating mitigation options that could be used to reduce the noise levels.

Our annual community noise survey was completed this Summer at five residences near the Joffre Site. Results from this survey will be shared at the October Community Open House.

Current mitigation projects:

- The E2 Furnace Refurbishment Project (update page 5) is using silencers on the new induced and forced draft furnace fans.
- Our North Rail Yard Noise Abatement Strategy is in place to meet commitments made to the community at a stakeholder workshop in 2013. The strategy is regularly assessed to ensure its effectiveness especially as increased shipments began this year.



*Enhanced noise monitoring introduced in 2016 helps us assess site operating noise and the effectiveness of various mitigation projects.*

## Joffre Community Advisory Panel (JCAP)

...A history of community outreach going back 35 years

NOVA Chemicals Joffre Site, located in Lacombe County, has been working with the community for many years. In fact, the original FARM-AGE community advisory group started meeting 35 years ago in 1982 — shortly after our operations started at the site.

Today, the Joffre Community Advisory Panel (JCAP) continues to promote and enhance two-way communications between the community and industrial operations resident on NOVA Chemicals' land holdings.

Meeting quarterly, the group covers a wide range of topics from business results to operational challenges, to environmental performance, community contributions and engagement activities. Raising and discussing community interests and concerns is key — and provides valuable input into our operations. JCAP members are interested in hearing from the community and want to hear from you.

To learn more about JCAP and NOVA Chemicals' operations please see:  
[www.novachemicals.com/Joffre](http://www.novachemicals.com/Joffre)



### Thank you to all the community representatives on FARM-AGE and JCAP through 35 years!

JCAP continues to play an important role in shaping the community focus of the Joffre Site and in fostering ongoing positive working relationships with industry, neighbours and the surrounding community.



**Current JCAP community members:**  
(Front row L-R): Angela Jones, Kathy Pyper  
(Back row L-R): Shawn Morton, Jim Robertson, Ken Burden, Mike Forsyth  
Missing from photo: Larry Keller, Mark Visscher



## Regulatory update

### Applications for Renewal of Operating Approval and Renewal of Waterworks System Approval:

In 2019 both of these approvals expire. We are now developing renewal applications for submission to AEP early in 2018.

This edition of *SiteLine* includes an overview of the comprehensive evaluation of our site's environmental performance since the last renewal. This information is an important component of the Operating Approval Renewal application. We will discuss the performance information with you at our October 11 Community Open House.

Once the Application for Renewal is deemed complete by AEP, notices will be placed to allow for public review of the application.

**An essential component of both of these renewal processes is consultation with our neighbours and community. Your input is welcome.**



## Oops! Wrong picture

In the July edition of *SiteLine*, we wanted to show you this picture of Dylan Fuller of the East Lacombe 4-H Club who had the Supreme Grand Champion at the annual Lacombe & District 4-H Steer Sale. He is pictured with NOVA Chemicals' Robert MacTaggart as we were pleased to purchase six steers at the sale, including Dylan's. Our apologies also to Michael Sharp (Reserve Champion sponsored by NOVA Chemicals) for the mix-up in pictures.

## Responsible Care verification coming in 2018

NOVA Chemicals takes part in regular verification processes since we received Responsible Care status in 1994.

Through this process, CIAC regularly assesses member companies for credibility with peers and the public, and for continuous improvement in the implementation of the Responsible Care ethic and principles. (See page 2 for Responsible Care overview.)

The CIAC-appointed team will include a community representative. JCAP provides input into the selection of the community representative.

We will provide more information on the process and outcome in the coming year.



## Community Open House

**Date:** Wednesday, October 11, 2017  
**Time:** 5:30 to 6:30 p.m. "Drop in to Chat"  
6:30 to 7:30 p.m. Presentation / Discussion  
**Place:** Haynes Hall (Travelling east on Highway 11, turn north (left) on Range Road 244 for 3.3 km to Township Road 390. Cross over 390 and take first left into parking lot of Haynes Hall.)

### Refreshments will be served

- Agenda:**
- Get business and facility operations updates
  - Review 16th Annual Environment Report to our community and upcoming Renewal of Operating Approval
  - Provide your input and suggestions

**We hope to see you there!**



**Celebrating together...  
Canada's 150th**

### SiteLine is published by NOVA Chemicals Corporation

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### For more information, please see these websites:

- [www.novachemicals.com](http://www.novachemicals.com) | [www.novachemicals.com/Joffre](http://www.novachemicals.com/Joffre)
- Chemistry Industry Association of Canada: [www.canadianchemistry.ca](http://www.canadianchemistry.ca)
- American Chemistry Council: [www.americanchemistry.com](http://www.americanchemistry.com)



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