



Chemistry Industry Association of Canada Association canadienne de l'industrie de la chimie

RESPONSIBLE CARE® VERIFICATION REPORT

NOVA CHEMICALS CORPORATION

September 24-28, 2012

Disclaimer

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Our commitment to sustainability.



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Notre engagement envers le développement durable.

EXECUTIVE SUMMARY

This report documents the observations and conclusions of the independent verification team tasked with conducting a Responsible Care Verification of NOVA Chemicals Corporation (NOVA Chemicals). The verification was undertaken on September 24 to September 28, 2012 and included team visits to their Joffre (near Red Deer, AB) and St. Clair Township (near Sarnia, ON) facilities. The verification team also conducted interviews with other company personnel at locations the team was unable to visit. This was the sixth Responsible Care verification completed for NOVA Chemicals. The last verification was completed on Mar 31, 2010.

As a result of the examination conducted, the verification team has concluded that the Responsible Care Ethic and Principles for Sustainability are guiding company decisions and actions, and that a self-healing management system is in place to drive continual improvement. The team believes that the company is capable of responding to the Finding Requiring Action identified during the verification - summarized below and discussed in detail in the report. The verification is complete and no further involvement is required by the verification team.

Signed: _____ Date: Nov 12, 2012
Gerry Whitcombe
Verification Team Leader

For more information on this or a previous Responsible Care Verification Report, please contact your local company site or the company's overall Responsible Care coordinator:

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Summary of Verification Team Observations

Findings Requiring Action

1. It is a finding requiring action to confirm that near neighbours know what to do should an emergency occur at company plant sites. 9

Improvement Opportunities

There is an improvement opportunity to.

1. develop a process for long-term proactive awareness of local land use zoning and development activities. 7
2. document the requirement that NOVA Chemicals regularly audit 3rd party pipeline service providers. 7
3. work with local neighbours to determine what is necessary to ensure they (and others performing contracted services e.g. custom combiners) i) can be notified and ii) are notified when working nearby. 9
4. benchmark existing company efforts against the self-assessment checklist contained in the new CIAC guidance document. 9
5. promote Responsible Care by name by adding the Responsible Care logo to the training/orientation video and to seek out other areas in the plant to display the RC logo. 10
6. increase the visibility of Responsible Care in communications with other parties. 11
7. include reference in NOVA Chemicals Corporate Standard 140 (Community Outreach and Involvement) to non-local Non-governmental Organizations (NGOs). 12
8. include in the Responsible Care Council a representative from the Sales organization on the Council as well as to consider the creation of an Accountability Code Functional Council to support company efforts in this area. 14
9. ensure public input into projects is routed effectively to plant design teams and that decisions are quickly reported back to the community. 14
10. document the requirements to review corporate and site procedures that have been spawned from corporate standards when those standards change. 14

Successful Practice

1. The team considers NOVA Chemicals overall rail transportation and distribution management practice an industry Best Practice. 8
2. The team views company's focus on understanding and implementing programs in support of CIAC's new focus on sustainability through the creation of a Sustainability Functional Council reporting to the Responsible Care Council as a successful practice 14
3. The team is of the opinion that the company audit system comprised of the Responsible Care Audit, the Facility Self-Assessment and the Focused Risk Assessment with external 3rd party system auditing is a successful practice. 15

1. INTRODUCTION

1.1 About Responsible Care Verification

As a member of the Chemistry Industry Association of Canada (CIAC), the most senior executive responsible for NOVA Chemicals operations in Canada attests annually to CIAC and its peers that the company's operations conform to the expectations contained in the Responsible Care Commitments and are guided by Responsible Care Ethic and Principles for Sustainability.

The Responsible Care® Ethic and Principles for Sustainability

We dedicate ourselves, our technology and our business practices to sustainability - the betterment of society, the environment and the economy. The principles of Responsible Care® are key to our business success, and compel us to:

- work for the improvement of people's lives and the environment, while striving to do no harm;
- be accountable and responsive to the public, especially our local communities, who have the right to understand the risks and benefits of what we do;
- take preventative action to protect health and the environment;
- innovate for safer products and processes that conserve resources and provide enhanced value;
- engage with our business partners to ensure the stewardship and security of our products, services and raw materials throughout their life-cycles;
- understand and meet expectations for social responsibility;
- work with all stakeholders for public policy and standards that enhance sustainability, act to advance legal requirements and meet or exceed their letter and spirit;
- promote awareness of Responsible Care, and inspire others to commit to these principles.

As an element of this commitment to Responsible Care, NOVA Chemicals must, every three years, participate in an external verification intended to:

1. Provide the Executive Contact with an external perspective when assessing if the company is indeed meeting the intent of the Responsible Care Commitments, along with advice on areas that may require attention;
2. Identify opportunities for assisting the company when benchmarking its own practices and performance against those of its peers, thus supporting continual improvement;
3. Contribute to the credibility of Responsible Care amongst company personnel and stakeholders, as well as the stakeholders of the broader industry;
4. Identify successful company practices that can be promoted to peers in the CIAC membership; and
5. Support the identification of areas of common weakness so that collective tools and guidance can be developed to improve performance in those areas across the CIAC membership.

Verification is conducted according to a common protocol, developed by the association's members and others, including several critics of the chemical industry. The verification is conducted by a team consisting of:

- Knowledgeable industry experts with experience in Responsible Care;
- A representative of the public at large (usually with a public interest background and with experience in Responsible Care gained from serving on the CIAC's National Advisory Panel) and
- One or more representatives of the local communities where the company's facilities are located.

Once completed, the Verification Report is made publicly available through the CIAC website (www.canadianchemistry.ca). NOVA Chemicals is also expected to share the report with interested persons in its communities and other stakeholders as part of their ongoing dialogue processes.

Additional information on Responsible Care and/or the verification process can be found at the CIAC website www.canadianchemistry.ca, or by contacting the Responsible Care staff at CIAC at glaurin@canadianchemistry.ca or (613) 237-6215 extension 233.

1.2 About NOVA Chemicals

NOVA Chemicals is a multinational chemical company owned by The International Petroleum Investment Company (IPIC) of the Emirate of Abu Dhabi and headquartered in Calgary, Alberta.

In Canada, the company manufactures ethylene, petrochemicals and a variety of polyethylene products at its facility in Joffre, Alberta (near Red Deer) and in three sites located near Sarnia, Ontario in Lambton County (Corunna, St Clair and Moore). The Joffre facility uses natural gas as raw material feed while the Corunna plant can use crude oil, petrochemical condensates or natural gas liquids as feed materials. Modification of the Corunna site to accept natural gas sourced from Marcellus Shale deposits in the northeast United States is underway. The Corunna facility produces various petrochemicals depending on the feedstock utilized. The Joffre site also has projects underway to accept ethane from the Bakken oil shale formation in North Dakota.

The company employs approximately 1600 workers in its Canadian manufacturing locations, and about 850 in its other operations across Canada and the rest of the world (Research and Development (R&D), Technical, Sales, Marketing, Corporate support).

For more information visit their website at www.NOVA Chemicalschem.com

1.3 About This Verification

The verification of NOVA Chemicals Corporation (NOVA Chemicals) was conducted on September 24 to September 28, 2012 and included team visits to their Joffre (near Red Deer, AB) and St. Clair Township (near Sarnia, ON) facilities. The verification team also conducted interviews with other company personnel at locations the team was unable to visit. During the course of the verification, the team had the opportunity to interact with a wide range of company personnel. Attachment 2 contains a list of those individuals interviewed and their affiliations.

This was the sixth Responsible Care verification completed for NOVA Chemicals. The last verification was completed on March 31, 2010.

The verification team was comprised of the following individuals.

Name	Affiliation	Representing
Gerry Whitcombe	CIAC Verifier	Industry (team leader)
Alec Robertson	CIAC Verifier	Industry
David Powell	CIAC Verifier	Public-At-Large
Bert Bell	Joffre Community Advisory Panel	Joffre Community
Marg Ryan	Bluewater Community Advisory Panel (BCAP)	Lambton County Community

2. TEAM OBSERVATIONS CONCERNING THE RESPONSIBLE CARE COMMITMENTS (CODES AND BENCHMARK AND COLLECTIVE EXPECTATIONS)

During the verification evidence that the company was addressing the expectations documented in the Responsible Care Commitments (152 code elements plus 28 benchmark and collective expectations) was examined.

In communicating its observations, the verification team will make repeated reference to the following categories of observations:

1. **Findings Requiring Action** document instances where the verification team observes specific company actions (or the absence of company actions) which are inconsistent with the detailed codes and benchmark and collective expectations contained in the Responsible Care Commitments. Where possible, the verification team will communicate, based on their experience and judgment, why it is inconsistent and how the observation relates back to a possible gap in the expected management system and / or the ethic and principles underpinning company actions. The team may also provide advice on how the situation might be responded to.
2. **Works in Progress** document instances where the verification team has observed the company self-initiating actions in response to identified gaps and deficiency arising from other internal or external audit and review activities, or where the company has self-initiated important improvement opportunities.
3. **Successful Practices** document instances where the team believes the company has taken actions that strongly support sustained excellence in performance, and which should be communicated throughout the CIAC membership.
4. **Improvement opportunities** identify instances where the verification team has observed company actions and decision making as being largely consistent with the expectations detailed in the Responsible Care Commitments, but for which the team is of the opinion that the company could support further improvement by considering alternate or additional benchmarks when undertaking its planning and decision making.

The verification team's observations of how the company has addressed the Responsible Care Commitments are as follows:

2.1 Team Observations Concerning Operations Code

2.1.1 Design and Construction of Facilities and Equipment

There is considerable activity underway as the company prepares for expansions and/or new facilities and the team interviewed company employees in Houston Texas who are involved with these projects. The team discovered well designed and managed processes led by competent personnel.

The team raised an issue expressed by the community with this design group. The issue related to the potential noise from the Joffre R3 facility (currently in design) from the perspective of making sure that community issues related to noise and increased rail and truck traffic were being addressed early in the process and in a manner sensitive to community concerns. The community felt that personalized feedback from company deliberations as well as continued/enhanced company dialogue with the

community were important aspects of any path forward. These methods of communication would be in conjunction with the proposed web based dialogue process.

Although not discussed with the design group the team also heard similar concerns from Corunna neighbours. There is an improvement opportunity in the Management Section of this report related to this issue.

The team reviewed the company response to a previous 'opportunity for improvement' and would like the company to reflect again on the benefits of having a formal process in place to understand community land use issues and be in a position to proactively ensure encroachment does not jeopardize plant operation and viability.

There is an improvement opportunity to develop a process for long-term proactive awareness of local land use zoning and development activities.

2.1.2 Operations Activities

The team is of the opinion that for Operations Activities the company generally exceeds Responsible Care code implementation expectations.

a. General Considerations

It is generally the responsibility of NOVA Chemicals Process Safety professionals to ensure that the objectives of Operations Code Element #7 have been achieved. The current level of analysis by these professionals exceeds code implementation expectations.

b. Laboratory Practice

The team reviewed general laboratory, quality control and Pilot Plant operations and found that all RC codes requirements have been met or exceeded.

c. Transportation and Physical Distribution

Overall for this section the Team is of the opinion that the company exceeds code implementation expectations.

The company has excellent programs and processes in place to cover large shipments of polyethylene as well as liquid petrochemicals via rail and truck and liquefied gases via pipeline (from suppliers, in house, direct to customers and to marine loading).

The team reviewed pipeline operations in both the west and east from the perspective of assuring the team that incidents such as those recently reported in the media are unlikely to occur at the company. The team found excellent programs in place for mechanical integrity and operations and a staff dedicated to ensuring safe operation.

The team was assured that on-going audits of 3rd party pipeline service providers are conducted regularly but the requirement to do so is not documented. For the purpose of sustainability the team is of the opinion that this should be reconsidered.

There is an improvement opportunity to document the requirement that NOVA Chemicals regularly audit 3rd party pipeline service providers.

The team reviewed TransCAER activities in the east and concludes that activities meet code expectations.

The team considers NOVA Chemicals overall rail transportation and distribution management practice an industry Best Practice.

Specific aspects include:

- Proactive involvement in the Association of American Railroads (AAR) specification development and review processes for railcar tanks, valves, wheels etc. Examples include performing a solid root cause analysis leading to the change of industry specs on railcar manways and the reduction in requalification time on general purpose railcar safety valves after investigation away from the industry recommended practice
- Utilization of global positioning satellite devices and wireless handbrake sensors to monitor dragging of cars with brakes on
- Recycle of pellets during hopper car lining refurbishment program
- Proactive involvement in CIAC's TEAP III team and TransCAER committees.
- Implementation of RIDETIGHT® gasket program for tank cars and a centrally maintained gasket matrix for railcars.
- Rail car specifications reviewed annually
- On-site/field visits with service providers
- Inclusion of Responsible Care in Stewardship meetings with suppliers/vendors
- Joffre facility recently completed 10 years without a transportation related non-accident release(NAR)

d. Maintenance

The team was very impressed by the company's maintenance function. The systems for planning and reliability (preventive maintenance (PM) as well as predictive preventive maintenance (PPM)) were outstanding. This is a new code area and the company exceeds code implementation expectations.

2.1.3 Safety and Security

a. Occupational Health and Safety

In the west the Team reviewed the company's Occupational Health (OH) program where it is striving to ensure the workforce is capable of performing their duties with the 'fitness to work' program and it is obvious the company is dedicated to maintaining or improving the general health of its employees with programs such as 'pick up the torch' and 'know your numbers'.

With Occupational Safety (OS) there has been recognition that a different thrust is required to reenergize the safety program. An intensive two day training program (Safety Management Systems) has been developed and is currently being implemented globally. Success of the program is in part due to the organizational structure driving the program – Responsible Care Council, NOVA Management Board Responsible Care (NMB RC) Committee and the Safety Improvement Strategy Core and Task Teams. Throughout the visit, the Team found broad acceptance of this initiative by employees.

Performance in OS has been about average when compared with the company's peers. Through its Safety Improvement Strategy the company is looking to take its performance to a higher level. .

b. Process Safety Management

The company has a rigorous program for hazard analysis and is on track to have all assessments caught up by the end of the year for all facilities and operating areas. Continual improvement is evident in the updating of technologies used by discipline practitioners.

c. Emergency Management

Programs both east and west are excellent as is participation in community based emergency response activities. There are issues related to ensuring the notification of farm workers outside and in equipment potentially in harm's way should an incident occur.

There is an improvement opportunity to work with local neighbours to determine what is necessary to ensure they (and others performing contracted services e.g. custom combiners) i) can be notified and ii) are notified when working nearby.

In talking with community members in the east the team identified that near neighbours were not as aware as they needed to be of the 'shelter in place' emergency strategy. This is discussed in detail in "Operating Site Community" section of the Accountability Code later in this Report. However, it is a requirement under Operations Code Element #39 that the company:

"i. ensures on a regular basis that residential and industrial neighbours that could be seriously affected by a site emergency scenario know what action to take should one of these scenarios occur ;"
It is a finding requiring action to confirm that near neighbours know what to do should an emergency occur at company plant sites.

The team reviewed the company's transportation emergency management system and found it to meet code implementation expectations.

d. Malicious Intent

All aspects of this code area meet code implementation expectations.

e. Critical Infrastructure/Business Continuity

The company has done some work in this area and coincidentally many of the risk characterizing scenarios are already described in STD 330 (Management of Process Risk). However, since guidance on this area is forthcoming from the CIAC, there is an opportunity to understand and adapt that guidance once available.

There is an improvement opportunity to benchmark existing company efforts against the self-assessment checklist contained in the new CIAC guidance document.

f. Incident Reporting and Investigation

The company has a process and an electronic tool to manage this area and are currently in the process of switching to a new module for their existing SAP installation (SAP is a commercial software system whose acronym stands for "Systems, Applications, and Products in Data Processing"). Currently the company fully meets implementation expectations for this code area. Nevertheless, the goal for switching to a new software product is to dramatically improve employee participation and incident notification and analysis capability.

2.1.4 Environmental Protection

The company has an excellent overall program in this area and generally exceed code implementation expectations.

They have completed the gap analysis and are in the process of implementing recommendations.

The team has listened to some concerns expressed by the community in respect of a potential noise increases from expansion projects (process related noises as well as increased rail traffic) and acknowledges the company's efforts to keep on top of the issues. We have, however, presented an improvement opportunity in the Management System section of this report to suggest a need for enhanced dialogue.

a. Emissions and Waste Reduction

The company is very proactive in its approach to emission and waste reduction and has completely rethought their environmental programs to align more closely with the guidance present in the codes resulting in an Environmental Management Information System (EMIS). They have used a 3rd party to audit their emission reporting. They have begun using a contractor to monitor fugitive emissions utilizing Infra-Red (IR) camera technology and are planning to use a thermal oxidizer to treat ethylene emissions from pellet bins.

b. Handling, Treatment and Disposal of Wastes

The company meets Responsible Care expectations in the management of hazardous and non-hazardous wastes. The company does research into improved waste treatment and disposal methodologies and looks for opportunities to deploy them. They track their improvements through a waste intensity metric.

2.1.5 Resource Conservation

The team concludes that code implementation expectations are being met for this area based on the examples presented to the team of where the company is actively looking to conserve resources.

One is the attempt to locate the new PE3 on as much currently developed land at the Joffre location as possible without taking land from their surrounding reserve.

Another is that they are beginning to look at overall life cycle with respect to the Marcellus Shale gas project and are attempting to delineate, understand and apply the process.

2.1.6 Promotion of Responsible Care by Name

All aspects of code implementation generally meet expectations. The team found that employees have internalized Responsible Care and that many opportunities have been taken to include promotion with third parties and others who provide services to the plants. Nevertheless, we did discover several areas where improvements could be made.

There is an improvement opportunity to promote Responsible Care by name by adding the Responsible Care logo to the training/orientation video and to seek out other areas in the plant to display the RC logo.

2.2 Team Observations Concerning Stewardship Code

Company representatives worked with other CIAC members and staff to develop the Stewardship Guide and then used the guide to set expectations during their Stewardship Code gap analysis exercise. The result has been an exemplary review of affected areas and a reinigorated effort on stewardship.

Existing programs and procedures are in place which fully met previous code expectations. Complete implementation of modifications or new programs/procedures is not scheduled to be completed until late 2013 but the results so far exceed code implementation expectations.

One decision to date, with far reaching implications, was to create a Sustainability Functional Council in support of the Responsible Care Council. Local membership on that team will allow a reasoned, informed and aligned approach to moving sustainability forward within the Stewardship sphere.

2.2.1 Expectations of Companies

a. Research and Development (R&D) Expectations

This area is well served by procedures and programs.

The R&D group performs better than company norms on lagging indicators and has a very active program utilizing leading indicators to help understand trends in order to avoid potential incidents.

b. Expectations Beyond R&D

A very thorough gap analysis resulted in effective integration of code requirements into standards and procedures. Most processes have been in place for nearly ten years so the modifications have been minimal.

2.2.2 Expectations with Respect to Other Parties

The team viewed some of the internal web material supporting activities for service providers and was impressed at how well all appropriate information and documentations are made available. This observation has been repeated in most areas visited.

The team viewed a presentation to a service provider (2012 Bulkmatic NOVA Chemicals Stewardship Presentation) and noted that only one mention was made about Responsible Care (“*Supports and endorses principles of Responsible Care.*”) and that there was no usage of the RC Logo. The team feels this would be an ideal venue for the ‘Promotion of Responsible Care by Name’.

There is an improvement opportunity to increase the visibility of Responsible Care in communications with other parties.

2.3 Team Observations Concerning Accountability Code

2.3.1 Operating Site Communities

In the west the program reflects the size and complexity of the site. They have excellent programs that are well executed. Recently they have joined with NOVA Chemicals pipeline group for the dissemination and collection of information. The plan is to expand the program put in place by the pipeline’s group contractor (EMIS) to include the plant’s 5km radius rural neighbours. However, there was concern expressed by members of the JCAP about NOVA Chemicals not providing a definitive answer to whether or not the planned plant expansion will increase the noise level of operations. This concern has been captured as an improvement opportunity in the management system section of this report. In the east the company also has well established and implemented programs.

They have for quite some time participated with other Lambton County industries in the Bluewater Community Advisory Panel (BCAP). The company is a member of the Sarnia and area CAER program consisting of an emergency response arm (CVECO - Chemical Valley Emergency Control Organization) as well as a community outreach component (Community Awareness Sarnia/Lambton). The company’s efforts in outreach have been given very high praise from community members with whom the team spoke.

However in the east the team continues to find that the community outreach component does not achieve expected outcomes. This finding is consistent with comments from other teams commenting on similar issues in other verifications. For example, shelter in place was not a concept well understood by near neighbours. Some were not aware of the St. Clair Twp. program making an electronic notification device (FM Alert) available under subsidy from the township. This is information that is expected to be delivered to the community by Community Awareness Sarnia/Lambton. Despite an honest effort by all partners, some nearby residents are not as aware as emergency standards require. Near neighbours could be immediately effected and they need to be prepared should an event occur.

Regardless of who has been charged with the task of delivering the information the company is responsible to determine that those residents are cognizant of and can act on required knowledge.

These observations form the basis of the finding presented in the 'Emergency Management' section of this report.

2.3.2 Other Stakeholders

All sections of this largely new group of code elements have been considered and standards appropriate to the company's situation have been put in place or current standards modified. The company demonstrated an excellent response to this new group of codes.

The company is addressing the requirements of the broader stakeholders section of the Accountability Code with an exception for the requirements with respect to Non-Governmental Organizations (NGO's) (section 3.6) where a broadening of approach would be to the company's benefit.

There is an improvement opportunity to include reference in NOVA Chemicals Corporate Standard 140 (Community Outreach and Involvement) to non-local Non-governmental Organizations (NGOs).

3. TEAM OBSERVATIONS ON THE COMPANY MANAGEMENT SYSTEM

It is a requirement of Responsible Care that companies have a documented, self-healing management system or systems capable of identifying and responding to deficiencies and otherwise supporting continual improvement across all company business units, functions, and sites and as a framework for implementing the Responsible Care Commitments.

The verification team studied NOVA Chemicals management system(s) and compared and contrasted the attributes of that system(s) to those of a self-healing overall management system as discussed in the CIAC Management System Guide. The verification team's related observations to the company management system(s) are as follows:

- The company has an overall Responsible Care Policy implemented through a documented management system ("Responsible Care Management System Manual").
- The system follows the ACC (American Chemistry Council) RCMS style and as such the company easily conforms to both the ACC and CIAC requirements.
- The manual sets requirements for Corporate Standards and Procedures covering all important aspects of Responsible Care and managing the system.
- In turn the Standards require Site and Business Programs and Procedures to ensure company compliance with its Responsible Care direction.

3.1 Observations on the PLAN Step

During the PLAN Step of the management system, the company decides what the goals of the company are and how they will be met. In determining those goals, it is expected the company will look inward, across its operations, but will also look outward, considering the expectations of: stakeholders; regulatory requirements; relevant CIAC Responsible Care Commitments and supporting tools; and other industry benchmarks.

In considering the PLAN Step of NOVA Chemicals management system, the verification team observed the following:

- The company has fully documented the processes necessary to successfully perform this component of the management system and fully meets implementation expectations.

3.2 Observations on the DO Step

During the Do Step in the management system, the company converts the decisions of the PLAN Step into action and ensures awareness and understanding by all involved. It is expected that the company will implement an organizational structure, assign responsibilities to appropriate personnel, supply sufficient training and resources to execute planned actions and develop and document standards, procedures and programs, as applicable.

In considering the DO Step of NOVA Chemicals management system, the verification team observed the following:

- A large strength of the company is its organizational structure for Responsible Care.
- The overall design including the Board of Directors, NOVA Chemicals Management Board (NMB), the Responsible Care Council (RCC) and the RC Functional Councils contribute to ensuring success in implementing and sustaining Responsible Care.
- All components have been carefully thought out, have clear charters, responsibilities and accountabilities.

The team observed a unique component in the Functional Council relating to Sustainability whose mandate it is to determine how the company will move forward on the new sustainability aspects found throughout all of the codes.

The team views company's focus on understanding and implementing programs in support of CIAC's new focus on sustainability through the creation of a Sustainability Functional Council reporting to the Responsible Care Council as a successful practice

In general terms the team concludes that the formation of the Responsible Care Council is key to its long term on-going improvement in Responsible Care performance. There are two suggested opportunities:

There is an improvement opportunity to include in the Responsible Care Council a representative from the Sales organization on the Council as well as to consider the creation of an Accountability Code Functional Council to support company efforts in this area.

The team observed on several occasions, described elsewhere in this report, community concern about specific issues (increased plant noise from new facilities, increased noise and traffic from increased rail, truck and construction activities)

The team would encourage the company to ensure its programs and procedures are effective in getting public input early and specifically from near neighbours and ensuring the information becomes part of plant design criteria and that any decisions are promptly communicated to the community.

There is an opportunity to ensure public input into projects is routed effectively to plant design teams and that decisions are quickly reported back to the community.

The team felt that documentation was comprehensive, mostly up-to-date and clearly in support of corporate standards. We were somewhat unclear as to how revisions to site procedures are initiated as the result of a revision to a corporate standard.

There is an improvement opportunity to document the requirements to review corporate and site procedures that have been spawned from corporate standards when those standards change.

In general the team believes that the 'do' part of the company's management system exceeds implementation expectations.

3.3 Observations on the CHECK Step

During the CHECK Step in the management system, actions carried out in the DO Step are assessed to determine if they are actually being carried out according to plan, and whether they are achieving the desired outcomes and delivering continual improvement. Here, the overall management system and components will be reviewed along with employee competences for assigned responsibilities. Internal and external audits will be undertaken, incidents will be assessed to identify root causes, and performance measurement will be conducted and reviewed.

In considering the Check Step of NOVA Chemicals management system, the verification team observed the following:

- The team found excellent programs, documentation and implementation.
- The Responsible Care Audit program, Facility Self-Assessment program, Focused Risk Assessment audit program are all exemplary. There is adequate staffing utilizing a central group and supplemented by auditors acquired from other facilities to ensure independence. The overall

program has had a 3rd party audit to determine audit system performance and to apply continual improvement.

The team is of the opinion that the company audit system comprised of the Responsible Care Audit, the Facility Self-Assessment and the Focused Risk Assessment with external 3rd party system auditing is a successful practice.

The team is of the opinion that implementation expectations for the check step of the company's management system have been exceeded.

3.4 Observations on the ACT Step

During the ACT Step in the management system, the company translates the results of the CHECK Step into corrective actions for improvement. This includes revisiting the PLAN Step to decide whether changes are need to the company's stated goals or action plans as well as policies and procedures for achieving those goals. Considerations when examining the Act Step include whether and how:

- audit and review findings are responded to;
- performance is communicated internally and externally;
- employee and contractor performance is rewarded and corrected,
- etc.

In considering the Act Step of NOVA Chemicals management system, the verification team observed the following:

- The company effectively takes all inputs from its audit program, risk assessments, corrective actions, Responsible Care performance and system reviews (among other inputs) and determines courses of action.

All implementation aspects of this component of the management system meet implementation expectations.

4. TEAM OBSERVATIONS ON THE RESPONSIBLE CARE ETHIC AND PRINCIPLES FOR SUSTAINABILITY

Each CIAC member company is formally committed to the ethic of *“Doing the right thing, and being seen to do the right thing.”* This ethic, along with the principles for sustainability are expected to guide the company’s decision making and practices. In conducting the verification, the team is looking to understand how well the ethic is understood and adopted within the company, and the degree to which the principles inform the manner in which the company does its business.

The verification team carefully observed NOVA Chemicals decision making processes and actions and compared and contrasted the attributes of those with the attributes of a company guided by the Responsible care Ethic and Principles For Sustainability as presented in Appendix E of the Responsible Care Commitments. The verification team’s related observations on the company’s application of the Responsible Care Ethic and Principles for Sustainability are as follows:

- It is the team’s opinion that the company aligns very well with all eight Principles for Sustainability and the team encourages NOVA Chemicals to continue making progress in all areas. At this time it has been strategically determined that the Responsible Care Ethic and the principles for Sustainability are the same, as well as equal and integrated with one another

Examples for each of the principles are:

- *work for the improvement of people’s lives and the environment, while striving to do no harm;*
The company has undertaken a renewed focus on rebranding plastics based on their important properties in protecting food and on their recyclability.
The company, through its health initiatives, is helping employees understand important medical issues and thus be in a better position to make healthy choices.
The number one priority determined through the Sustainability Council’s strategic planning is recruiting, training and supporting employees.
During the re-verification, all individuals were valued and treated with dignity, respect and openness.
The company’s initiative with Lambton College ensures there is a well trained work force (e.g. CPET program) to replace retirees with newly hired employees.
- *be accountable and responsive to the public, especially our local communities, who have the right to understand the risks and benefits of what we do;*
The company expends significant amounts of energy into making sure they are open, engaged and transparent with their local communities.
Manufacturing East decommissioned a storage tank early, due to the fact that interventions did not eliminate the odour complaint from a near neighbour. This resolved the problem.
- *take preventative action to protect health and the environment ;*
There is a new company wide initiative just underway to reinvigorate the company’s safety programs. Each and every company employee will participate and the company hopes to make a step change in safety performance as a result.

The NOVA Chemicals Sarnia area employees completed their first water front cleanup on Ferry Dock hill on the St. Clair River.

The necessary communication to document and find “root cause” for a reportable injury is embedded and flows seamlessly between manufacturing sites and corporate. The drive for the

zero injuries initiative inspired by sister company Borealis (a member of Responsible Care in Europe) has been integrated into the company's safety improvement strategy. Even though the target is not presently met, it is believed that this principle is attainable.

Achieving superior Responsible Care performance lives in the Mission/Strategy statement of NOVA Chemicals.

- *innovate for safer products and processes that conserve resources and provide enhanced value;*
NOVA Chemicals focuses on making products better with respect to their use, resource conservation, etc. (the life cycle of the product). The life cycle approach is driven in part by criticism of plastics as a category, but also by innovation for better products that address a commercial opportunity as well as increase recyclability (e.g. making caps and closures out of polyethylene for polyethylene containers simplifies recycling and reduces contamination). Plastic food packaging has the potential for significantly decreasing the 40% of food which currently is wasted globally.

New plants are being designed to occupy already developed land.

The Sunoco pipeline from Philadelphia and used by NOVA Chemicals is being reversed as part of the Marcellus Project. This is conserving resources and enhancing value of a present resource.

The work to reconfigure Corunna to accept ethane directly is also an example.

- *engage with our business partners to ensure the stewardship and security of our products, services and raw materials throughout their life-cycles;*

The Board of Directors, CEO and the Management Board had to be convinced that the development of the Marcellus Shale gas deposits could be developed for NOVA Chemicals benefit with sound scientific evidence that collateral harm would not occur.

The pipeline portion of the project is being vetted by a 3rd party due diligence process. Emphasis on ensuring the integrity of the shipping process will help ensure broad public support and approval in the light of recent pipeline oil spills.

NOVA Chemicals owned pipelines are all being retrofitted or replaced over five years in order to make them all 'smart pigable.'

NOVA Chemicals was one of six recipients of the 2011 Non-Accident Release Grand Slam Award for achieving excellence in rail transportation of hazardous materials from the Association of American Railroads. (To be eligible to receive the award, a shipper must be honoured individually by at least four Class 1 railroads and have zero non-accident releases (NAR) the previous calendar year)

- *understand and meet expectations for social responsibility;*

Have a corporate policy on supporting Education and Science, Health and Community Services and the Arts.

Manufacturing East and West have very active support programs as does Calgary headquarters. Manufacturing East has financially supported the newly opened Alix Art Gallery, which can now house and display one of the largest Group of Seven collections in Canada.

- *work with all stakeholders for public policy and standards that enhance sustainability, act to advance legal requirements and meet or exceed their letter and spirit;*

The company actively participates in all CIAC programs for public programs and standards to enhance sustainability.

- *promote awareness of Responsible Care, and inspire others to commit to these principles.*
There is strong support for the promotion of Responsible Care by company executives. The CEO has insisted that ACC meetings begin with a safety moment. He has created a CEO award for Responsible Care (awarded to the loading staff at Joffre for 10 years without a Non-Accident Release)

NOVA Chemicals executives have joined with other CIAC company executives to formulate a letter of encouragement for a non-member to join CIAC after it received adverse publicity following an incident.

5. VERIFICATION TEAM CONCLUSION

As a result of the examination conducted, and in consideration of the observations communicated within this report, the verification team is of the opinion that the Responsible Care Ethic and Principles for Sustainability are guiding company decisions and actions, and that a self-healing management system is in place to drive continual improvement. The team believes that the company is capable of responding to the Finding Requiring Action identified during the verification -summarized above and discussed in detail in the report. The verification is complete and no further involvement is required by the verification team.

Attachment 1

Company Response to Verification Team Report

On behalf of NOVA Chemicals I have reviewed this verification report. The observations and conclusions contained in the report have been discussed with the verification team.

NOVA Chemicals will communicate the results of the verification exercise with its CIAC peers at their next meeting, and will discuss the verification results with our stakeholders, including those representing communities near our operating sites.

We will give consideration to the Improvement Opportunities identified by verification team and will assist the CIAC in communicating and sharing the identified Successful Practices to other CIAC members. Plans will be developed and implemented to respond to the Findings Requiring Action identified by the verification team. Our progress in implementing those plans will be discussed when preparing our Annual Statement of Re-Commitment to Responsible Care, and communicated to the verification team at the time of our next verification.

We appreciate the pragmatic approach and candor of the Verification Team and thank them for the new perspectives, guidance and shared enthusiasm for Responsible Care demonstrated throughout the verification process. The Verification Team's efforts to apply the new CIAC Verification Process delivered a significant improvement in terms of efficiency of preparation, focus on relevant issues and clarity of the results.

Eric Hiddema
Overall Responsible Care Coordinator
NOVA Chemicals Company
28 January, 2013

Attachment 2

Interview Lists

A: Company Personnel and Stakeholders Contacted During Verification Process

Name	Position	Location
Corporate Functions		
Randy Woelfel	Chief Executive Officer	USCC, Pittsburgh, PA
Bill Greene	Senior VP, Operations	USCC, Pittsburgh, PA
Grant Thomson	Senior VP and President, Olefins & Feedstock	NHO, Calgary, AB
Pace Markowitz	Director, Corporate Communications	USCC, Pittsburgh, PA
Wendy Lomicka	Sustainability & Citizenship Leader	USCC, Pittsburgh, PA
Mark Lesky	Director, Responsible Care	USCC, Pittsburgh, PA
Eric Hiddema	Responsible Care Systems & Projects Manager	NHO, Calgary, AB
Dave Schwass	Senior Advisor, Environment	NRTC, Calgary, AB
Nigel Clark	Director, Logistics Operation	USCC, Pittsburgh, PA
Dave Blanchard	Dry Bulk Truck Coordinator	USCC, Pittsburgh, PA
Kevin DeAngelis	Rail Fleet Maintenance Manager	USCC, Pittsburgh, PA
Carrie Maxim	Distribution Specialist, Logistics	Sarnia, ON
Fred Henselwood	Leader, Process Safety	NHO, Calgary, AB
Paul Vandervoort	Leader, Technical Services	Joffre Site, Joffre, AB
Manny Marta	Process Safety Engineer	Sarnia, ON
Research & Development; Stewardship		
Daryll Harrison	VP, Technology	NRTC, Calgary, AB
Rod Immel	Team Leader, Research Support	NRTC, Calgary, AB
Adrian Cassola	Leader, Product Integrity	Mississauga, ON
Mike Francis	Scientist, Environment & Corrosion	NRTC, Calgary, AB
Linda Santry	Senior Advisor, Product Regulations	Mississauga, ON
Ken Sonnenberg	Senior Advisor, Product Regulations	NHO, Calgary, AB
Linda LeGoullon	Product Stewardship Team Leader	USCC, Pittsburgh, PA
Anna Madajczuk	Advisor, Product Stewardship	Sarnia, ON
Manufacturing West		
Rick VanHemmen	Director, Manufacturing West	Joffre, AB
Ed Bryant	Leader, Polyethylene	Joffre, AB
Jim Dixon	Leader, Process Engineering	Joffre, AB
Lois Erichson	Operations Leader	Joffre, AB
Roxann Good	Communications, Community Relations	Joffre, AB
Dave Richmond	Director, Central Engineering	Joffre, AB
Ernie Tromposch	Project Leader, Engineering & Projects	Joffre, AB
David Weizenbach	Team Leader, Responsible Care	Joffre, AB
Doug Batke	Safety Specialist	Joffre, AB
Sherri LaRose	Regional Coordinator, Occupational Health	Joffre, AB
Craig Ellefson	Laboratory Coordinator	Joffre, AB
Ben Couturier	Operations Training Specialist	Joffre, AB
Ross Boukall	Construction Leader	Joffre, AB
Kevin Imeson	Inventory Analyst, Purchasing & Supply	Joffre, AB
Janeth Liendo	Process Engineering	Joffre, AB

Name	Position	Location
George Donaldson	Operations	Joffre, AB
Ken Morton	Member Joffre CAP/Near Neighbour	Joffre, AB
Norma Carman	Member Joffre CAP/Near Neighbour	Joffre, AB
Kathy Pyper	Member Joffre CAP/Near Neighbour	Joffre, AB
Jim Robertson	Member Joffre CAP/Near Neighbour	Joffre, AB
Mike Marshall	Member Joffre CAP/Near Neighbour	Joffre, AB
Dawn Marshall	Member Joffre CAP/Near Neighbour	Joffre, AB
Manufacturing East		
Tom Thompson	Regional Manufacturing Director	Sarnia, ON
Ted Cooper	Leader, Regional Maintenance & Reliability	Sarnia, ON
Steve Gyurky	Laboratory Coordinator	Sarnia, ON
Krista Hagan	HR, Community Relations	Sarnia, ON
John Harwood	Metallurgical Inspector	Sarnia, ON
Percy Holder	Laboratory Coordinator	Sarnia, ON
Bob Huggett	Occupational Hygiene	Sarnia, ON
Richard Ilves	Senior Environmental Coordinator	Sarnia, ON
Dave Lyford	Poly Laboratory/Pilot Plant Team Leader	Sarnia, ON
Sean McCarthy	Team Leader, Mechanical Reliability	Sarnia, ON
Margy Muller	Team Leader, Manufacturing	Sarnia, ON
Bill Ramsay	Team Leader, HD/LD & Utilities	Sarnia, ON
Ted Salari	Regional Technical Leader	Sarnia, ON
Bill Taylor	Senior Operations Coordinator	Sarnia, ON
Rob Thompson	Director, HR Business Consulting & Organizational Effectiveness	Sarnia, ON
Tracy Tiernay	Communications Consultant	Sarnia, ON
Kevin Schroeter	Team Leader, Safety, ER, Security	Sarnia, ON
Kathy Brodie	Safety & Emergency Response Specialist	Sarnia, ON
Emilio Iacobelli	Safety & Emergency Response Specialist	Sarnia, ON
Pat Lea	Safety & Emergency Response Specialist	Sarnia, ON
Stakeholders		
Ken Morton & Norma Carman	Member Joffre CAP/Near Neighbour	Joffre, AB
Kathy Pyper	Member Joffre CAP/Near Neighbour	Joffre, AB
Jim Robertson	Member Joffre CAP/Near Neighbour	Joffre, AB
Mike & Dawn Marshall	Member Joffre CAP/Near Neighbour	Joffre, AB
John Burton	Member BCAP	Corunna, ON
Ralph Butt	Member BCAP	St Clair Twp, ON
Rick Charlebois	Member BCAP	Sarnia, ON
Clarke Henry	Member BCAP	Sarnia, ON
Liz McLachlan	Member BCAP	Sarnia, ON
Rakesh Taneja	Member BCAP	Sarnia, ON
Jack & Frances Prouse	Moore site near neighbour	St Clair Twp, ON
Linda Wilson	Corunna Site near neighbour	St Clair Twp, ON
Nicole Wilson	Corunna Site near neighbour	St Clair Twp, ON
Patrice McClemens	Corunna Site near neighbour	St Clair Twp, ON