

Disclaimer

This report has been produced by a team, convened by the Chemistry Industry Association of Canada (CIAC), to provide advice to the member-company and assist it in meeting its Responsible Care[®] commitments. The material in this report reflects the team's best judgment in light of the information available to it at the time of preparation. It is the responsibility of the CIAC member-company that is the subject of this report to interpret and act on the report's findings and recommendations as it sees fit. Any use which a third party makes of this document, or any reliance on the document or decisions made based upon it, are the responsibility of such third parties. Although CIAC members are expected to share the results of this guidance document with interested parties, the Association, its member-companies, their employees, consultants and other participants involved in preparing the document accept no responsibility whatsoever for damages, if any, suffered by a third party as a result of decisions made or actions based on this report.

Responsible Care® is a registered trademark of the Chemistry Industry Association of Canada.

EXECUTIVE SUMMARY

This report documents the observations and conclusions of the independent verification team tasked with conducting a Responsible Care Verification of National Silicates. The verification was undertaken on May 17, 18, 2016, and included team visits to the headquarters in Etobicoke (Toronto) Ontario. The verification team also conducted interviews with other company personnel by phone at locations the team was unable to visit. This was the seventh Responsible Care verification completed for National Silicates. The last verification was completed on March 2013.

While considering all aspects of the Responsible Care Commitments during this verification the team placed an emphasis on conducting an in-depth examination of company aspects related to:

- Responsible Care Ethics and Principles of Sustainability
- Promoting Responsible Care up and down the chemical value chain
- Identifying opportunities for assisting the company when benchmarking its own practices against those of its peers, thus supporting continual improvement
- Re-energizing Corporate Sustainability
- Management of Change
- Reduction of Waste & Waste Management

As a result of the examination conducted, 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 Improvement Opportunities 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.

Verification Team Leader

Andie Ken

Archie Kerr Date: August 8, 2016

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:

Jennie Houle

Health, Safety & Environmental Manager

416-255-7771 Ex.149

Jennie.houle@silicates.com

SUMMARY OF VERIFICATION TEAM OBSERVATIONS

Findings Requiring Action:

The verification team would like to congratulate the National Silicates Management Team and all of its employees as the re-verification did not identify any Findings Requiring Action.

Improvement Opportunities:

- 1. Place copy of the most recent Responsible Care verification report on the National Silicates website or provide a link to the CIAC website that would go directly to the Responsible Care verification reports. (AC 146). This was completed by the second day of the verification
- 2. Promote Responsible Care by name by providing more details of Responsible Care and how it improves HSE in the Contractor's Booklet. (OP 81)
- 3. Include the Responsible Care logo on SS-20 product bags for RC promotion going down the value chain. (ST 102)
- 4. Contact the local Emergency Planning department in each National Silicates' facility area to determine if an evacuation plan for the local community is part of their emergency response plans. This is in case there is a major incident of a near-by industry involving a hazardous chemical release or a serious train derailment. (OP 33-35)
- 5. Evaluate the installation of lighting motion sensors in areas where employees only have to go a few time per shift. (OP 76-77)
- 6. National Silicates needs to complete a simulation with observers to test that there are no gaps in the business continuity plan. (OP 49-55)
- 7. Standardize intranet terminology (PQ Vision) for all Canadian sites to make it easier to search and find specific information. (OP 7)
- 8. Work with Corporate PQ Corporation to better articulate sustainability policy and practices throughout the organization.
- 9. Provide examples that support National Silicates five Pillars of Sustainability as outlined in the CIAC's commitment to the Principles for Sustainability.
- 10. Work with the Valleyfield CAP facilitator and other industrial partners to increase the number of community members. (AC 130)
- 11. National Silicates should evaluate the in-situ remediation of the oil contaminated soil at the Toronto site. (OP72)
- 12. Repair or replace the leaking heat exchanger in Shipping and clean up the area to eliminate a slipping hazard. (OP18)

Works in Progress:

1. National Silicates has developed an effective dust control practice that involves moisturizing the raw material during the batching process. The company needs to continue the high pressure cleaning to

remove historical dust accumulation throughout the processing area.

2. National Silicates has organized a team to reduce cost and waste of tank bottoms. They are investigating a chelating agent to maintain clarity in suspension. They are also working with a local university to try and find a use for tank bottoms rather than sending the material to a non hazardous waste facility.

Successful Practices:

- 1. National Silicates has developed a very visual and engaging inspection system in the office and plant, called Sticks and Snakes. A small area (200 300 sq ft) is inspected for safety, housekeeping and general appearances. Each concern is identified with a tag and a photo is taken, as the issues are resolved the tags are removed and a post inspection photo is taken when all identified issues have been resolved. The before and after photos are posted and shared with all plant employees to show the improvements.
- 2. The National Silicates BBS process has been running for 7 years and has a 82% participation rate at the Toronto facility. The 22 plant employees are doing approximately 70 observations per month. The program is driven by hourly employees who visit other facilities in North America to assist them with the BBS implementation and improvement.

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 National Silicates 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 are committed to do the right thing, and be seen to do the right thing.

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, National Silicates 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.canadianchemsitry.ca). National Silicates is also expected to share the report with interested persons in its communities and other stakeholders as part of its 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 CIAC at glaurin@canadianchemistry.ca or (613) 237-6215 extension 233.

1.2 About National Silicates

National Silicates is a wholly owned subsidiary of PQ Corporation based in Malvern PA USA. Recently George Blitz was appointed President and CEO. Approximately a year ago CCMP purchased PQ Corporation and all of its manufacturing sites including National Silicates.

National Silicates have 77 employees in their Canadian operation at the following four operational locations:

- Valleyfield, Quebec 18 employees
- Toronto, Ontario 22 employees plus management and technical staff
- Whitecourt, Alberta 5 employees
- Surrey, British Columbia 5 employees
- The Parksville, BC plant was closed in February 2015

National Silicates in Canada produce sodium & potassium silicates in solid, powder and liquid forms at their Toronto facility and has four dissolvers and two furnaces. Toronto is the corporate headquarters including engineering and technical support staff in Canada. Valleyfield produces only sodium silicates in solid and liquid forms and has four dissolvers and one furnace. Their Whitecourt facility produces liquid sodium & potassium silicates in their dissolvers and Surrey produces liquid sodium silicates and liquid magnesium sulphate. For more details, visit PQ Corporation or National Silicates websites:

- www.pqcorp.com
- www.silicates.com

1.3 About This Verification

The verification of National Silicates was conducted on May 17 & 18, 2016. Plant management, a Toronto community representative and a Community Advisory Panel member from Valleyfield Quebec were present in Toronto during the verification. Management from their Whitecourt and Surrey facilities utilized conference call system for various sections of the verification. During the course of the verification, the team had the opportunity to interact with a wide range of company personnel, as well as stakeholders external to the company. Attachment 2 contains a list of those individuals interviewed and their affiliations.

This is the seventh verification exercise completed for National Silicates. The last verification was completed on March 2013.

The verification team was comprised of the following individuals.

Name	Affiliation	Representing
Archie Kerr	CIAC Verifier	Team Leader Industry
Brenda Lorenz	CIAC Verifier	Public-At-Large Verifier Environmentalist
Chris Goddard	Toronto Ontario	Community Representative
Nicole Thibeault	Valleyfield Quebec	Community Representative CAP Member

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

During the verification of National Silicates, the verification team looked for evidence that the company was addressing the expectations documented in the Responsible Care Commitments (152 code elements plus 28 benchmark and collective expectations). While considering all aspects of the Responsible Care Commitments, the team placed an emphasis on conducting a more in-depth examination of certain company aspects identified by the company or the team related to:

- Responsible Care Ethics and Principles of Sustainability
- Promoting Responsible Care up and down the chemical value chain
- Identifying opportunities for assisting the company when benchmarking its own practices against those of its peers, thus supporting continual improvement
- Re-energizing Corporate Sustainability
- Management of Change
- Reduction of Waste & Waste Management

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, benchmarks and collective expectations contained in the Responsible Care Commitments. Where possible, the 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 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.
- 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 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

The Verification Team was impressed with the management commitment towards Responsible Care and the details of the National Silicates management system with the focus on the Plan, Do, Check, Act. This is relatively a small member company that provides significant "sweat equity" on many CIAC Committees.

2.1.1 Design and Construction of Facilities and Equipment

National Silicates use the PQ Corporate Engineering standards when designing or rebuilding equipment. The company has started tracking equipment failures using their incident reports. The results of the findings and follow ups are documented in their Corrective Action Preventative Action (CAPA) system. For any new or modified equipment or processes the electronic Management of Change (MOC) system will trigger the need for a Process Hazard Analysis and/or Job Safety Analysis as well as a Pre-start Health and Safety Review for each MOC.

Mechanical Integrity such as pressure testing or tank or pipe wall thickness testing is managed using their Maintenance Management system software (EPAC). IR testing for all electric furnace equipment is conducted on a routine basis as well as arc flash reviews are done every three years.

Engineering staff from across all the North American operations as well as furnace operators hold an annual conference to share best practices and review procedures. PQ Corporation has a dedicated furnace start-up crew that travels to any facility in North America, ensuring standardization and sharing of best practices from the various facilities during a furnace commissioning after a rebuild.

National Silicate meets Responsible Care Design & Construction expectations

2.1.2 Operations Activities

The company has many electronic standards and procedures to ensure that controls are applied appropriately for both process and maintenance operations. Procedural reviews are conducted regularly using the MOC system. As part of National Silicates management system there is an annual review of all Responsible Care codes and under ISO 14001 annual Aspects and Impacts reviews are completed on all of their Canadian operations.

• There is an Opportunity For Improvement that National Silicates standardize intranet terminology (PQ Vision) for all Canadian sites to make it easier to search and find information (OP7)

National Silicates use only approved carriers with dedicated trailers to transport their products. The shipper checks the bulk tank using a pre-load checklist and verifies the cleaning certificate before he/she begins to load. Customer tank trucks undergo the same scrutiny and at times are not loaded because of a physical defect or not being properly cleaned. A company representative meets with its dedicated carrier or customer's carrier to review complaints and determines how deficiencies can be rectified.

Operations Maintenance at the facilities relies heavily on Outside Contractors. Before any work is done the contractor's employees must review the Contractor's Safety booklet and complete a short quiz.

The computer maintenance software has a list of all critical equipment, inspection frequency, spare part list and documented mechanical procedures that are given to contractors when completing a maintenance task. The computer also tracks how long it takes to get safety work orders completed; this is one of their Key Performance Indicators (KPI).

• There is an Opportunity for Improvement that the leaking heat exchanger in Shipping be repaired or replaced and clean up the area to eliminate a slipping hazard. (OP18)

Packaging in bulk sacks or bags is only done at their Toronto facility using approved packaging suppliers utilizing UN designated packaging.

National Silicate meets Responsible Care Operations Activities expectations (OP7-21)

2.1.3 Safety and Security

The verification team reviewed the six subsections (OP22-57) and finds that National Silicates meets the Responsible Care expectations.

a. Occupational Health & Safety

Job Safety Analysis (JSA), Behavioral Based Safety (BBS) and JHSC Sticks & Snakes intense inspection all increase employee's safety awareness. The intense inspection looks at safety, housekeeping and general appearance of a small 200-300 sq ft area and tags everything that is sub-standard as the issue is resolved the tag is removed. Pictures are taken before and after to show the improvements. All identified hazards are documented either in the CAPA or EPAC software system for follow up and closure.

All day shifts in every facility begin with a safety tailgate talk. Incidents for other North American plants are reviewed. Once every other week there is a Safety conference call lasting approximately 30 minutes Management, JHSC, and plant operators in control rooms can all listen in.

JHSC indicated that they are getting 82% participation in their BBS process being driven by hourly employees. JHSC at each facility share meeting minutes to remain current on H & S issues. National Silicates sponsors an annual conference for JHSC members from each facility to attend. Overall the JHSC see significant management commitment to address issues and improve safety culture.

The Industrial Hygiene program includes dust, noise, asbestos and silica. Plant monitoring is conducted to determine employee's exposure. Once every two years, plant employees have audiometric tests, chest X-rays and pulmonary lung function tests. All employees and contractors are trained on how and when to wear respiratory protection and is given a respirator fit test.

The verification team feels that the following Occupational Health and Safety initiatives are Successful Practices:

National Silicates have developed a very visual and engaging inspection system in the office and plant, called Sticks and Snakes. A small area (200 – 300 sq ft) is inspected for safety, housekeeping and general appearances. Each concern is identified with a tag and a photo is taken, as the issues are resolved the tags are removed and a post inspection photo is taken when all identified issues have been resolved. The before and after photos are posted and shared with all plant employees to show the improvements.

The National Silicates BBS process has been running for 7 years and has an 82% participation rate at the Toronto facility. The 22 plant employees are doing approximately 70 observations per month. The program is driven by a task force composed of hourly employees who visits other facilities in North America to assist other PQ Corporation plants in implementing BBS.

b. Process Safety Management

All new equipment projects use the latest ASME or API standards. If equipment is being replaced or changed the Management of Change (MOC) process is used and requires both HSE and Operations sign off. If the change is more complex, other specialists will also be asked to review and sign off on the project. Each of the MOC changes also requires a Pre-start Health and Safety Review before the equipment is turned over to process operators

National Silicates participates in the CIAC Process Safety Management Committee to remain current.

Emergency Management Fixed Facilities & Transportation

The Company has both a fixed facility and transportation emergency plans in place. The City of Toronto Fire

Department has National Silicates Emergency Plan on file. In addition, Valleyfield has an automated call out system in place for their near neighbours.

During a Responsible Care visit to their near industrial neighbours, the Toronto plant discovered that a food processing plant used significant quantities of Ammonia for refrigeration.

The verification team identified and Opportunity for Improvement that:

each National Silicates facility contact the local Emergency Planning department to determine the
details of the evacuation plan if there were ever a near industrial neighbour major incident
involving a hazardous chemical release or a serious train derailment and incorporate the details in
their emergency response plans. (OP 33-35)

To minimize transportation emergencies only pre- approved carriers will be used. These carriers have their own emergency contractors and National Silicates would supply technical assistance in the case of a transportation emergency.

c. Malicious Intent

Each facility has completed a third party Vulnerability Assessment. As a result of the findings close circuit cameras have been installed and monitors are located in the control rooms. Selected management has access to the cameras and can monitor remotely over the internet.

d. Critical Infrastructure/Business Continuity

A Business Continuity study has been completed and documented identifying roles and responsibilities; it is kept current by the Director of Plant Operations. The verification team identified an Opportunity for Improvement:

• That National Silicates needs to complete a simulation with observers to test the business continuity plan to determine if there are any gaps. (OP 49-55).

The Company computer system is backed up remotely by corporate offices in the US. The IT firewall and access to the system through the internet is via secure VPN servers and managed by corporate.

e. Incident Reporting and Investigation

There are no issues in this area; procedures are in place and effective. The company's Corrective Action Preventative Action (CAPA software) tracks incident to closure. The software sends out emails on overdue action items to the assigned employee. Final approval and closure is either HSE or a senior manager.

2.1.4 Environmental Protection

National Silicates sets annual performance goals for emissions and waste generation. There is a team working on reducing or reusing tank bottoms one of their largest wastes.

Over the last three years there has only been one off site incident involving dust. National Silicates has been encouraging reporting of environmental incidents and the numbers are increasing year over year but have decreased in severity. The verification team identified an Improvement Opportunity that:

 National Silicates could evaluate other opportunities for the in-situ remediation of the oil contaminated soil at the Toronto site. (OP72)

The Verification Team noted the following Works in Progress:

National Silicates has developed an effective dust control practice that involves moisturizing the raw
material during the batching process. The company needs to continue the high pressure cleaning to
remove historical dust accumulation throughout the processing area.

National Silicates has organized a team to reduce cost and waste of tank bottoms. It is investigating a
chelating agent to maintain clarity in suspension. It is also working with a local university to try and
find a use for tank bottoms rather than sending the material to a non-hazardous waste facility.

The Company meets Responsible Care Environmental expectations

2.1.5 Resource Conservation

Each year each facility is required to set energy intensity targets for electricity and water. The Toronto facility recently converted all its lighting to LED or low energy T 41 lights. The verification team identified an Opportunity for Improvement that:

• National Silicates evaluate the installation of lighting motion sensors in areas where employees only have to go a few time per shift. (OP 76-77).

Most of the water used is recycled and no process water is discharged to the sewers. Water softeners and reverse osmosis process is used to condition boiler feed water reducing water use by 90% and chemical treatment by 80%

The Company meets Responsible Care expectations for Resource Conservation expectations.

2.1.6 Promotion of Responsible Care by Name

The Company has taken many opportunities to promote Responsible Care. Each year both the Toronto and the Valleyfield facilities visit their close neighbours and provide them with the National Silicates Responsible Care brochure. Every Site visitor goes through a safety orientation that also discusses Responsible Care. The verification team identified an Opportunity for Improvement that more details about responsible Care and how it improves H & S be included in the Contractor's Safety Booklet. (OP81)

The National Silicates representative on the Toronto West CAER group promotes Responsible Care at the meeting of 14 Industrial organizations that are not CIAC members. Recently Responsible Care verbiage has been included in Supplier contracts

The Company exceeds the Responsible Care implementation expectations for this section

2.2 Team Observations Concerning Stewardship Code

The practices and procedures in place meet the Product Stewardship Code at National Silicates

2.2.1 Expectations of Companies

The company's Tech Services group uses a development project planning template to identify potential HES, PSM and toxicity testing for any new application of existing products. The Tech service group develops plant and/or customer procedures when introducing a new chemical or new application of an existing product. The Tech Services Group also works with Suppliers, testing the purity of the raw materials and completes a MOC if changing suppliers.

2.2.2 Expectations with Respect to Other Parties

The Company works with new customers in the chemical value chain doing on-site visits. The National Silicates representative looks at their unloading facilities, the use of the chemical, provides MSDS and education for customers not familiar with the product. They have also developed safe handling bulletins for safe storage and handling of their products.

• There is an Improvement Opportunity to include the Responsible Care logo on SS-20 product bags for RC promotion going down the value chain. (ST 102)

2.3 Team Observations Concerning Accountability Code

National Silicates has done an exceptional job of implementing the Accountability Code. All employees interviewed by the verification team were enthusiastic ambassadors of Responsible Care activities.

2.3.1 Operating Site Communities

All sites have produced a detailed brochure describing the company's products, guiding principles potential hazards, including their Responsible Care and Sustainability initiatives. These are hand delivered to the Site's near neighbours. As well Valleyfield has completed an open house since the last verification. V is a member of the Community Advisory Panel along with other adjacent industries and members of the public. Many of the public members have been on the CAP for many years. There is an Improvement Opportunity:

- That National Silicates work with the Valleyfield CAP facilitator and other industrial partners to increase the number of community members. (AC 130)
- To place a copy of the most recent Responsible Care verification report on the National Silicates website or provide a link to the CIAC website that would go directly to the Responsible Care verification reports. (AC 146). This was completed by the second day of the verification.

2.3.2 Other Stakeholders

The Company has an answering service 24/7 taking down any concerns and their contact information so a call back can be made the next day once the investigation has taken place. Currently National Silicate's employee from Toronto is president of the South Etobicoke Employers Association and has been a member for over 22 years. National Silicates employees are involved with the Local Chamber of Commerce and a number of social services such as Out of the Cold Lunches.

The Plant Manager is chair of the Ontario West CIAC committee and interacts with local MPs and MPPs promoting Responsible Care. From 2009 to 2014 National Silicates was actively involved as a facilitator of the local area air study. Once the results were presented the local environmental committee has ceased to exist.

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 National Silicates 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:

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 National Silicates management system, the verification team observed the following:

The Verification team reviewed the documented and mature Responsible Care Management System
and was impressed that management staffs interviewed were competent and comfortable with their
management system giving examples of how day to day activities were driven by Responsible Care.
They consider stakeholder input, business imperatives, laws and regulation, industry best practices and
Responsible Care Commitment during their planning process.

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 National Silicates management system, the verification team observed the following:

Management identifies resources needed, identifies risk and critical areas of focus and develops
training programs and completes competency reviews. They also have an ongoing corporate
requirement to review and update all documentation on HSE and Responsible Care and have it
electronically available for every employee at every facility in Canada.

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 National Silicates management system, the verification team observed the following:

The Company completes annual management reviews of all aspects of Responsible Care. Their
incident management procedures require a root cause identification of all HSE incidents and
equipment failure. Management Performance Reviews are completed to ensure that targets and goals
are being achieved. Third Party reviews are completed for both ISO 9001 & 14001 as part of the Check
cycle of the Management Program

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, 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 or corrected, etc.

In considering the Act Step of National Silicates management system, the verification team observed the following:

The Verification Team saw evidence of the Act step in the electronic CAPA corrective action and follow
up software program. The company's active involvement in the community, communication of their
performance to their stakeholders and their customer complaint process meet the intent of the Act
step of Responsible Care.

In considering the Management system of Responsible Care's Plan, Do, Check, Act, National Silicates Management System exceeds the Responsible Care 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 is 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 National Silicates 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 discussed in the Responsible Care Commitments (Appendix E).

The verification team's related observations on the company's application of the *Responsible Care Ethic and Principles for Sustainability* are as follows:

- The company is committed to promoting Responsible Care and is actively involved in a number of CIAC committees providing sweat equity on 16 different committees, which is above and beyond what many small to medium company's involvement.
- National Silicates has a Sustainability Policy that echoes CIAC Principles of Sustainability. They have also developed the Five Pillars of Sustainability including; social responsibility, economic, environmental, and process and products for the Canadian manufacturing facilities.

At the previous verification in 2013 the Verification team had discussions with a PQ Corporation Director of Sustainability new hire. However, progress has been slow and the Verification team has identified two Improvement Opportunities that includes:

- Working with Corporate PQ Corporation to better articulate sustainability policy and practices throughout the organization.
- Provide examples that support National Silicates five Pillars of Sustainability as outlined in the CIAC's commitment to the Principles for Sustainability.

These opportunities would allow the PQ Corporation to better articulate the corporate sustainability policy and practices that would be the overarching sustainability mandate that the organization could use to filter the principles throughout the company. The examples would support National Silicates' reason for having the Five Pillars of Sustainability and their importance in encouraging the use of sustainable practices throughout the company. During the verification management cited a number of products and activities that support the Five Pillars of Sustainability but none of it was documented

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 range of Findings Requiring Action identified during the verification, as summarized in the Executive Summary and discussed in detail in the report. The verification is complete and no further involvement is required by the verification team.

COMPANY RESPONSE TO VERIFICATION TEAM REPORT

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

National Silicates found the verification to be very useful in identifying other areas of improvement and we place a lot of value in closing those items within our CAPA system. As well, we would like to thank our community representatives, Nicole Thibeault and Chris Goddard for being personally dedicated to ensuring a transparent process with members of the community in which we conduct business. Thank you to both Archie Kerr and Brenda Lorenz for their insight and contribution to the verification process.

National Silicates 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.

Larry Masaro
Director of Plant Operations
National Silicates / PQ Corporation
August 5, 2016

INTERVIEW LISTS

A: Company Personnel

Name	Position	Location
Larry Masaro	Director of Plant Operations North America	Toronto
Jennie Houle	Manager HSE Canada / Illinois	Toronto
Carmen Romano	Plant Manager	Toronto
Michel Brassard	Regional Operations Manager Canada/ California	Valleyfield, QC
Jake L'Ecuyer	HSE Specialist	Toronto
Mike Vinca	Purchasing & Traffic Manager	Toronto
Michael White	Process Safety Specialist/Quality & Engineering	Valleyfield, QC
Lorne Quenneville	Furnace Operator (JHSC)	Toronto
Mark Duffy	Maintenance (Member of the NA JHSC Task Force)	Toronto
Steve Kidman	Transfer Operator (Member of the NA BBS Task Force)	Toronto
Adelina Santaluce	Customer Service/Inside Sales (JHSC)	Toronto
Mary Ann Lavrisa	Prod Planning & Inventory Control (BBS)	Toronto
Dave Patterson	Director of Sales	Toronto
Tim Evans	Technical Director	Toronto
Erin Bending	Product Stewardship Manager	Conshohocken, PA
Lynda Ryder	HR Director	Toronto
Del Osonaike	Finance	Toronto

B: External Stakeholders

Name	Company / Organization	Position	Location
Chris Goddard	Community Rep.		Toronto, ON
Nicole Thibeault	Community Rep & CAP Member		Valleyfield, QC

