ALBERTA
ENVIRONMENTAL APPEAL BOARD

Report and Recommendations

Dates of Hearing – November 26, December 16, 17, and 18, 2002
Date of Report and Recommendations – January 17, 2003

IN THE MATTER OF Sections 91, 92, 94, and 95 of the *Environmental Protection and Enhancement Act,* R.S.A. 2000, c. E-12;

-and-

IN THE MATTER OF Notices of Appeal filed by Ron and Gail Maga and Ron Maga Jr., Cameron Wakefield, A. Ted Krug, Stanley Kondratiuk, Roger G. Hodkinson, Neil Hayes, and Anna T. Krug, with respect to Amending Approval No. 10339-01-03 issued to Inland Cement Limited by the Director, Northern Region, Regional Services, Alberta Environment.

Cite as: *Maga et al*. v. *Director, Northern Region, Regional Services, Alberta Environment* re: *Inland Cement Limited* (17 January 2003), Appeal Nos. 02-023, 024, 026, 029, 037, 047, and 074-R (A.E.A.B.).

HEARING BEFORE:	William A. Tilleman, Q.C., Chair; Dr. Steve Hrudey; and Mr. Al Schulz.
PARTIES:	
Appellants:	Mr. Ron and Ms. Gail Maga and Mr. Ron Maga Jr., Mr. Cameron Wakefield, Mr. A. Ted Krug, Mr. Stanley Kondratiuk, Dr. Roger G. Hodkinson, represented by Ms. Jennifer Klimek; Mr. Neil Hayes; and Ms. Anna T. Krug, represented by Mr. Gavin Fitch, Rooney Prentice.
Director:	Mr. Kem Singh, Director, Northern Region, Regional Services, Alberta Environment, represented by Mr. William McDonald and Mr. Darin Stepaniuk, Alberta Justice.
Approval Holder:	Inland Cement Inc. (Lehigh Inland Cement Inc.), represented by Mr. Dennis Thomas and Mr. Martin Ignasiak, Fraser Milner Casgrain LLP.
Other Parties:	Edmonton Friends of the North Environmental Society, represented by Ms. Jennifer Klimek; the Edmonton Federation of Community Leagues, represented by Mr. Gavin Fitch, Rooney Prentice; and the Capital Health Authority and the Medical Officer of Health represented by Mr. James Murphy, Q.C., Ogilivie LLP.
WITNESSES:	
Appellants (EFONES):	Ms. Verona Goodwin, Dr. Brian Sproule, Dr. Michael Brauer, Dr. Colin Soskolone, Mr. James Darwish, Mr. Cameron Wakefield, Mr. Ted Krug, and Mr. Stanley Kondratiuk.
Appellants (EFCL):	Mr. Allan Bolstad, Mr. Darryl Ranks, Mr. Allan Church, Ms. Bonnie Quinn, Mr. Bill Quinn, Ms. Anna Krug, Ms. Bernice Neufeld, Mr. Brian McCosh, and Dr. Edo Nyland.
Appellant (Mr. Neil Hayes):	Mr. Neil Hayes, and Ms. Sheila English.
Director:	Mr. Kem Singh, Ms. Anita Sartori, Mr. Alex MacKenzie, and Mr. Bob Myrick.
Approval Holder:	Mr. Keith Meagher, Mr. Martin Rawlings, Dr. Volker Hoenig, and Dr. Gordon Brown.
Capital Health Authority:	Dr. Gerald Predy, and Mr. Nelson Fok.

EXECUTIVE SUMMARY

Alberta Environment issued an Amending Approval under the *Environmental Protection and Enhancement Act* to Inland Cement Limited (Inland) to allow the burning of coal instead of natural gas as a fuel source for its cement plant in Edmonton, Alberta. The Board received twenty-nine appeals. Largely based on agreement between the parties, the Board accepted seven appeals from local residents, and also made the Edmonton Federation of Community Leagues and the Edmonton Friends of the North Environmental Society parties to these appeals.

The Board heard about widespread community concern over the health and nuisance impacts of emissions from Inland because of its location immediately upwind from Edmonton and Inland's documented track record of "dusting" events affecting the neighbouring community. The issue of particulate emission controls from the cement kiln dominated the evidence.

Inland applied for the Amending Approval to avoid remaining the only cement manufacturing plant in Canada to use natural gas, thereby avoiding a serious competitive disadvantage. The Board accepts that it is possible for cement manufacturing plants to use coal as a fuel and also achieve acceptable emissions by applying the best available demonstrated technology (BADT), as required by Alberta Environment policy.

The particulate emission levels from the kiln in the Amending Approval were taken from the Canadian Council of Ministers of the Environment (CCME) National Emission Guideline for Cement Kilns, which make no claim to represent BADT for this industry, but which establishes "maximum broad national emission limits" recognizing that "federal, provincial or regional authorities may impose more stringent limits in response to regional or local problems." In this case, there are valid potential health concerns, related to peak emission levels of fine particulates from the existing electrostatic precipitator (ESP) for this cement kiln. These were predicted to exceed relevant ambient air quality criteria. The body of evidence in support of health concerns in the population arising from exposure to fine particulates provides a credible case for minimizing population exposures to these pollutants. Furthermore, short term health effects, among sensitive individuals such as asthmatics, that may arise from peak exposures to airborne particulate matter are a concern. However, the Board found no credibility in the prediction of a specific number of fatalities being caused by the emissions from the Inland cement plant.

The history of poor operation of Inland's ESP ranged from periodic complete shutdowns (ESP trips) to periods of poor performance. Only some of these excessive emission events were reportable. Dusting events causing nuisance conditions and potential health concerns in adjacent communities were documented from various fugitive emissions, as well as from the cement kiln's stack. The Director addressed the problem of fugitive emissions aggressively in the Amending Approval and sought to deal with the excessive peak emissions of particulates from the kiln stack by severely limiting the number of ESP trips that would be allowed in the future. However, based on substantial evidence, the specified improvements with this ESP do not constitute BADT in terms of providing consistent control of peak particulate emissions. Such emissions upwind of a large urban population makes the requirement for emission control by BADT compelling.

The Director required installation of a baghouse in the event that Inland could not control the number of ESP trips. This requirement, combined with considerable additional evidence, have convinced the Board that a baghouse, with its capability for superior and consistent performance, constitutes BADT for the kiln stack at Inland.

The Board has therefore recommended that the Minister confirm the Amending Approval, subject to the following changes:

1. the existing ESP on the kiln stack should be replaced by a fabric filter baghouse as soon as possible, but no later than 20 months from the date of the Minister's Order;
2. the number of allowable ESP trips that should be permitted until the baghouse is operational should be 6 per calendar year;
3. until the baghouse is operational, Inland should develop a local residents notification system to contact those residents who request to be advised of ESP trips;
4. the emission limits set for particulate matter should be re-evaluated with a view to lowering them to reflect achievable baghouse performance; and
5. Inland should establish and fund an ongoing Local Residents Liaison Committee to the satisfaction of the Director.

The Board believes, that when the baghouse on the kiln stack and the fugitive emission plans are operational, the past concerns with potential health risk and nuisance conditions that have been associated with emissions from the Inland cement plant should be largely resolved.

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I. BACKGROUND

A. Introduction

[1] On May 24, 2002, the Director, Northern Region, Regional Services, Alberta Environment (the "Director") issued Amending Approval No. 10339-01-03 (the "Approval") to Inland Cement Limited[1] ("Inland" or the "Approval Holder") under the *Environmental Protection and Enhancement Act,* R.S.A. 2000, c. E-12 ("EPEA" or the "Act") for the construction, operation, and reclamation of a cement manufacturing plant (the "Plant") in Edmonton, Alberta. The Approval allows for the burning of coal instead of natural gas as a fuel source (the "Substitution Fuel Project") at the Plant.

[2] Between June 14, 2002, and July 2, 2002, the Environmental Appeal Board (the "Board") received a total of twenty-nine appeals with respect to the Approval. Notices of Appeal were received from Mr. David Doull (02-018), Mr. James Darwish (02-019), Ms. Verona Goodwin (02-020), Ms. Elena P. Napora (02-021), Mr. Don Stuike (02-022), Mr. Ron and Ms. Gail Maga and Mr. Ron Maga Jr. (02-023), Mr. Cameron Wakefield (02-024), Mr. David J. Parker (02-025), Mr. A. Ted Krug (02-026), Mr. Bill Bocock (02-027), Mr. Michael Nelson (02-028), Mr. Stanley Kondratiuk (02-029), Mr. Greg Ostapowicz (02-030), Mr. Douglas Price (02-031), Ms. Holly MacDonald (02-032), Mr. Stuart Pederson (02-033), Ms. Linda Stratulat (02-034), Mr. Leonard Rud (02-035), Mr. Marcel Wichink (02-036), Dr. Roger G. Hodkinson (02-037), Ms. Lorraine Vetsch (02-038), Ms. Gwen Davies (02-039), Mr. Garry Marler (02-040), a group of Community Leagues from the City of Edmonton (02-041),[2] Mr. Neil Hayes (02-047), Mr. Robert Wilde (02-060), the Edmonton Friends of the North Environmental Society

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[1] On September 11, 2002, the Board was notified that Inland Cement Limited is now Lehigh Inland Cement Limited.

[2] The group of Community Leagues from the City of Edmonton is composed of all of the Community Leagues in the City of Edmonton that are members of the Edmonton Federation of Community Leagues (the "EFCL"), "…and in particular the Community Leagues of Sherbrooke, Dovercourt, Inglewood, Wellington Park, Athlone, Woodcroft, Mayfield, High Park, McQueen and North Glenora…." See: EFCL's Submission, dated November 15, 2002, at paragraph 2. According to the EFCL, it was authorized to bring this appeal on behalf of all community leagues in the City of Edmonton. They further stated that approximately 58,480 households are community league members, and therefore, the appeal is on behalf of approximately 59 percent of the citizens of Edmonton. See: EFCL's Submission, dated November 15, 2002, at page 5. The Notice of Appeal filed by the EFCL was on behalf of this group of Community Leagues and on behalf of two individuals, Ms. Bonnie Quinn (02-073) and Ms. Anna T. Krug (02-074). While these three parties filed only one Notice of Appeal, their standing

("EFONES") (02-061),[3] Ms. Bonnie Quinn (02-073), and Ms. Anna T. Krug (02-074) (collectively the "Notice of Appeal Filers").[4]

[3] The Board acknowledged receipt of these appeals and notified the Notice of Appeal Filers, the Approval Holder, and the Director of these appeals. In the same letters, the Board also requested (1) that the Director provide the Board with a copy of the records (the "Record") relating to the Approval, and (2) available dates for a preliminary meeting, a mediation meeting, or a hearing.

B. AEUB

[4] According to standard practice, the Board wrote to the Natural Resources Conservation Board ("NRCB") and the Alberta Energy and Utilities Board ("AEUB") asking whether this matter had been the subject of a hearing or review under their respective legislation. Section 95 of the Act requires the Board to consider whether the issues in the Notices of Appeal have been considered by the NRCB or the AEUB.[5] The NRCB notified the Board that these

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differs, and as a result, the Board assigned three appeal numbers to this one Notice of Appeal.

[3] A total of three Notices of Appeal were filed on behalf of EFONES. On July 2, 2002, EFONES filed its third Notice of Appeal. Attached to this Notice of Appeal was a letter from EFONES indicating that the Notices of Appeal filed by Mr. James Darwish and Mr. Robert Wilde were intended to be filed on behalf of themselves and EFONES.

[4] The majority of the Notice of Appeal filers nominated either EFONES or the EFCL to represent them. EFONES represented: Mr. James Darwish, Ms. Verona Goodwin, Ms. Elena P. Napora, Mr. Don Stuike, Mr. Ron and Ms. Gail Maga and Mr. Ron Maga Jr., Mr. Cameron Wakefield, Mr. David J. Parker, Mr. A. Ted Krug, Mr. Bill Bocock, Mr. Michael Nelson, Mr. Stanley Kondratiuk, Mr. Greg Ostapowicz, Mr. Douglas Price, Ms. Holly MacDonald, Mr. Stuart Pederson, Ms. Linda Stratulat, Mr. Leonard Rud, Mr. Marcel Wichink, Dr. Roger G. Hodkinson, Ms. Lorraine Vetsch, Ms. Gwen Davies, Mr. Garry Marler, and Mr. Robert Wilde. The EFCL represented: the group of Community Leagues from the City of Edmonton, Ms. Bonnie Quinn, and Ms. Anna T. Krug. Mr. David Doull and Mr. Neil Hayes represented themselves.

[5] Sections 95(2)(a) and 95(5)(b)(i) of EPEA provide:

> "95(2) Prior to conducting a hearing of an appeal, the Board may, in accordance with the regulations, determine which matters included in notices of appeal properly before it will be included in the hearing of the appeal, and in making that determination the Board may consider the following: (a) whether the matter was the subject of a public hearing or review under Part 2 of the *Agricultural Operation Practices Act*, under the *Natural Resources Conservation Board Act* or under any Act administered by the Energy Resources Conservation Board and whether the person submitting the notice of appeal received notice of and participated in or had the opportunity to participate in the hearing or review….
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> (5) The Board … (b) shall dismiss a notice of appeal if in the Board's opinion (i) the person submitting the notice of appeal received notice of or participated in or had the opportunity to participate in one or more hearings or reviews under Part 2 of the *Agricultural Operation Practices Act*, under the *Natural Resources Conservation Board Act* or any Act administered by

appeals were not subject to review under its legislation. The AEUB stated that it had not held a public hearing or review into the subject matter of the appeals. However, the AEUB did provide a copy of Industrial Development Permit No. IDP 00-1 and IDP IC 80-1 (the "IDP"), permitting "…Inland to use natural gas produced in Alberta as fuel in the production of cement in the Province.…"[6]

[5] In reviewing the IDP, the Board noted that it authorizes "…the use of natural gas produced in Alberta for the production of cement in Alberta…," and it was granted on the basis that, in the AEUB's opinion, the permit "…is in the public interest having regard to among other considerations, the efficient use without waste of energy resources and the present and future availability of hydrocarbons in Alberta…." The IDP was issued subject to a number of terms and conditions, including that it may be "…appropriate to remove the 5-year term renewal requirement if and when Inland Cement Limited has completed a conversion of its plant to the use of coal as fuel…" and that the plant shall be operated "…in a manner that results in (a) the maximum practically and economically obtainable efficiency in the use of fuel for the manufacture of cement, and (b) the maximum practical and economical conservation of fuel."[7] The IDP also made reference to Inland using coal or coke as a fuel source.[8]

[6] The Board requested the parties provide submissions on whether the issues as identified by the Board had been considered by the AEUB.[9] After reviewing the documentation

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the Energy Resources Conservation Board at which all of the matters included in the notice of appeal were adequately dealt with…."

6 See: AEUB's letter, dated July 17, 2002, and attachements.

7 See: AEUB's letter, dated July 17, 2002, and attachments.

8 It states in section 3:

"(2) If the Permittee does not complete the installation of equipment to allow for the use of coal and/or coke as fuel in the cement plant referred to herein, the Board, by stipulation, may extend the term of this permit for one or more periods of five years provided the Permittee shall satisfy the Board at least 12 months in advance of the date on which the permit would otherwise terminate that, all relevant matters considered, gas remains the more suitable fuel in the public interest.

(3) If the Permittee has completed the installation of equipment to allow for the use of coal and/or coke as fuel in the cement plant referred to herein, and the equipment is fully capable of operation, the Permittee shall immediately notify the Board. Upon the Board being so notified, and subject to the conformity by the Permittee with the terms and conditions hereof, this permit shall be for a term ending on December 31, 2008."

See: AEUB's letter, dated July 17, 2002, and attachments.

9 See: Board's letter, dated October 9, 2002. The letter stated:

provided by the AEUB and the submissions of the parties, who all agreed that section 95(2)(a) and 95(5)(b)(i) of EPEA were inapplicable in these circumstances, the Board determined that the issues that are before the Board have not been considered in any hearing or review by the AEUB. Accordingly, we proceeded with the hearing of these appeals.

C. Preliminary Matters

[7] On June 24, 2002, the Board received a letter from the Approval Holder asking that all meetings regarding these appeals be put in abeyance until the deadline for filing Notices of Appeal had passed so that one Preliminary Meeting could be held for all of the appeals. The Board granted this request.

[8] On July 11, 2002, the Board received a copy of the Record, which was forwarded to the Notice of Appeal Filers and the Approval Holder on July 22, 2002. In the Director's cover letter, he stated that he would be pleased to participate in discussions to reach a consensus as to the issues and parties that should be allowed at the hearing.

[9] On July 17, 2002, the Board received a letter from the Approval Holder in which it disputed that any of the Notice of Appeal Filers had standing, but if some of the Notice of Appeal Filers were determined to have standing, it was willing to work with the other parties to work out an agreement on the issues to be heard.

> "As stated, in deciding to either limit or dismiss the appeals pursuant to section 95, the Board must consider whether the persons submitting the notice of appeal received notice of, or participated in or had the opportunity to participate in a hearing or review under an Act administered by the [A]EUB at which all of the matters included in the notice of appeal were adequately dealt with.
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> Upon initial review, the evidence before the Board appears to indicate that with respect to the IDP, there was no public hearing or review. There also does not appear to be any evidence before this Board to indicate that the persons filing the Notices of Appeal had an opportunity to participate in the [A]EUB's decision making process. Finally, there is no evidence before this Board that the matters included in the Notices of Appeal were dealt with by the [A]EUB. Therefore, it would appear that section 95(2)(a) and 95(5)(b)(i) are inapplicable in this case.
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> Prior to making a final determination respecting the applicability of these sections, the Board would like to receive the submissions of the parties. Therefore, the Board would like to receive submissions from the parties as to whether the persons submitting the Notices of Appeal received notice of or participated in or had the opportunity to participate in a hearing or review under an Act administered by the [A]EUB at which all of the matters included in the notice of appeal were adequately dealt with." (Emphasis omitted.)

[10] On August 2, 2002, the Board wrote to the parties and indicated it would schedule a Preliminary Meeting to deal with various motions that had been identified. The Board specified a deadline by which any other preliminary motions needed to be filed. No other preliminary motions were received.

[11] On August 27, 2002, the Board advised all parties that a Preliminary Meeting would be held on September 17, 2002, with potential hearing dates in November 2002. The Board stated that the purpose of the Preliminary Meeting was to hear arguments on the following matters:

> "1. the standing of the Appellants [(Notice of Appeal Filers)], including their directly affected status and whether they filed valid statements of concern;
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> 2. the standing of Mr. Doull, including whether the statement of concern filed by Mr. Doull is a valid statement of concern for the purposes of filing a Notice of Appeal and whether Mr. Doull is directly affected;
>
> 3. the issues to be dealt with at the hearing of these appeals; and
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> 4. whether to consolidate the appeals."[10]

[12] On September 5, 2002, EFONES contacted the Board and advised that it, along with the Director, Approval Holder, and the EFCL were close to an agreement on recommending to the Board what issues should be considered at the hearing and who should be granted standing. EFONES requested an extension to the deadline for filing written submissions. The Board granted this request and the parties provided written submissions.[11]

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[10] Board's letter, dated August 27, 2002. The motion with respect to Mr. Doull was raised by the Director and is based on the view that Mr. Doull (and some of the other Notice of Appeal Filers for that matter) filed a statement of concern in the environmental assessment process under Part 2, Division 1 of EPEA, entitled "Environmental Assessment Process," instead of under Part 2, Division 2 of EPEA, entitled "Approvals, Registrations and Certificates," as required by section 91(1)(a)(i) of EPEA.

[11] In granting this extension, the Board was concerned about potential prejudice to Mr. Hayes as he had provided his written submissions on September 5, 2002. As a result, Board staff contacted the Director and Inland, who advised that they were not going to object to Mr. Hayes' standing. As a result of these representations, Mr. Hayes did not object to the extension. See: Board's letter, dated September 5, 2002.

On September 16, 2002, Board staff received a telephone call from Mr. Neil Hayes. Mr. Hayes advised that due to a family emergency he would be unable to attend the Preliminary Meeting on September 17, 2002. On September 17, 2002, the Board convened the Preliminary Meeting and advised the Parties that Mr. Neil Hayes was unable to attend. The Board advised the Parties that it would like to proceed with the Preliminary Meeting, but would provide Mr. Hayes with an opportunity to provide a written rebuttal submission before making its final decision. None of the Parties expressed any concerns, and the Board proceeded with the Preliminary Meeting. On September 26, 2002, the Board provided Mr. Hayes with a copy of the audio recording of the Preliminary Meeting, and on September 30, 2002, Mr. Hayes provided his rebuttal submission to the Board.

D. Parties

[13] The Board wrote to the parties advising of its decision on October 2, 2002, and provided its reasons on October 11, 2002.[12] The Board determined that Mr. Cam Wakefield (02-024), Mr. Ted Krug (02-026), Mr. Stan Kondratiuk (02-029), Mr. Ron and Ms. Gail Maga and Ron Maga Jr. (02-023), Dr. Roger Hodkinson (02-037), Mr. Neil Hayes (02-047), and Ms. Anna T. Krug (01-074) (collectively, along with the EFCL and EFONES, the "Appellants") would have standing at the Hearing. The Board also accepted the EFONES and the EFCL as full parties to these appeals.[13] The remaining Notices of Appeal were either dismissed or withdrawn.[14]

E. Issues

[14] The Board determined that the following issues would be included in the hearing:

> "1. emission limits for particulate matter, sulphur dioxide, nitrogen oxides, heavy metals and radioisotopes;
> 2. adequacy of existing baseline data;
> 3. emission monitoring, including the type, location and frequency of monitoring – see Approval Clauses 2.3.1, 3.2.5, 3.2.6, 3.2.10 to 3.2.12, 4.1.20 to 4.1.22, 4.126 to 4.1.29, 4.1.38 to 4.1.44, and 4.1.47 to 4.1.49;
> 4. appropriateness and validity of modeling methods and results;
> 5. appropriateness of including certain requirements in the Approval as opposed to making them requirements of the application, specifically:
> a. ambient air monitoring plans – see Approval Clauses 3.2.7 to 3.2.12,
> b. trial burn – see Approval Clauses 3.2.14 to 3.2.19,
> c. fugitive emission reduction plan – see Approval Clauses 3.2.20 to 3.2.25,
> d. use of landfill gas – see Approval Clauses 3.2.26 to 3.2.28, and
> e. information regarding the type and source of coal;

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[12] See: Preliminary Issues: *Doull et al.* v. *Director, Northern Region, Regional Services, Alberta Environment* re: *Inland Cement Limited* (11 October 2002), Appeal Nos. 02-018-041, 047, 060, 061, 073, and 074-ID1 (A.E.A.B.).

[13] See: Preliminary Issues: *Doull et al.* v. *Director, Northern Region, Regional Services, Alberta Environment* re: *Inland Cement Limited* (11 October 2002), Appeal Nos. 02-018-041, 047, 060, 061, 073, and 074-ID1 (A.E.A.B.) at paragraphs 96 and 97. The appeal of Mr. David Doull was dismissed. The other Notice of Appeal Filers not granted standing had agreed to withdraw their appeals and allow the EFCL and EFONES present their concerns.

[14] See: Letter from EFONES, dated November 25, 2002. Therefore, the proper parties to these appeals are the Appellants, the Approval Holder, and the Director (collectively the "Parties").

6. use of best available demonstrated technology – see Approval Clauses 4.1.4 to 4.1.8;
7. timeline for installation of a baghouse – see Approval Clauses 4.1.34 to 4.1.37;
8. number of trips – see Approval Clauses 4.1.31to 4.1.33;
9. local residents trip notification system;
10. adequacy of health impact assessment – see Approval Clauses 4.1.51 to 4.1.54;
11. appropriateness of health impact assessment update – see Approval Clauses 4.1.51 to 4.1.54;
12. ongoing consultation with local residents and local residents liaison committee;
13. need for the conversion to coal as a fuel source;
14. control of greenhouse gas emissions; and
15. use of tires as kiln fuel limited to Approval Clause 4.1.17."[15]

F. Document Production

[15] On October 9, 2002, the Board received a request from the EFCL to compel the Approval Holder to produce a number of documents.[16] The EFCL had requested the documents from the Approval Holder on September 25, 2002, but the Approval Holder had refused to voluntarily provide the documents.[17]

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[15] Preliminary Issues: *Doull et al.* v. *Director, Northern Region, Regional Services, Alberta Environment* re: *Inland Cement Limited* (11 October 2002), Appeal Nos. 02-018-041, 047, 060, 061, 073, and 074-ID1 (A.E.A.B.) at paragraph 99.

[16] The documents requested were:

"1. Binder entitled Reportable Incidents 1997
2. Binder entitled Reportable Incidents January to August 1998
3. Binder entitled Reportable Incidents September to December 1998
4. Binder entitled Reportable Incidents 1999
5. Binder entitled Reportable Incidents January to June 2000
6. Binder entitled Reportable Incidents July to December 2000
7. Binder entitled 1997 Monthly Environmental Reports
8. Binder entitled 1998 Monthly Environmental Reports
9. Binder entitled 1999 & 2000 Monthly Environmental Reports
10. Letter re 1998 Annual Summary & Environmental Report
11. Letter re 1999 Annual Summary & Environmental Report
12. Letter re 2000 Annual Summary & Environmental Report."

See: EFCL's Letter, dated October 9, 2002, at pages 2 to 3.

[17] See: EFCL's letter to the Approval Holder, dated September 25, 2002, and copied to the Board. See also: Approval Holder's letter, dated September 26, 2002.

[16] The Board requested submissions from the Parties on the issue of document production.[18] After reviewing the arguments presented, the Board notified the Parties that the documents appeared to be potentially relevant and necessary to the issues in these appeals. Thus, the Board ordered the Approval Holder to produce a witness to speak to and to produce copies of each of the requested documents.[19] The Approval Holder provided the documents to the other Parties on November 12, 2002.

G. Adjournment Request

[17] The Hearing was scheduled for November 26, and 27, 2000, and submissions in preparation for the Hearing were received from the Parties on November 15, 2002. The Board reviewed the submissions of the Parties, and as the issue of public health was important to everyone involved, the Board contacted the Parties and the Capital Health Authority to determine if a representative of the Capital Health Authority should attend the Hearing and appear as one of the Director's witnesses or as an independent witness.[20] On November 25, 2002, the Board received a letter from the Capital Health Authority stating that it "…believes that the process and decision were reasonable. In view of the short time frame, Capital Health is unable to adequately prepare for the hearing, and as a result, we will not be attending the hearing."[21]

[18] Included in the submissions filed by the Approval Holder on November 15, 2002, was a health impact study by Cantox Environmental entitled "Human Health Risk Assessment of the Lehigh Inland Cement Limited Substitution Fuel Project", dated November 13, 2002 (the "Cantox Report"). On November 22, 2002, the Board received a revised version of this report, dated November 21, 2002 (the "Revised Cantox Report" and collectively the "Cantox Reports").

[19] On November 25, 2002, the Board received letters from the EFCL and EFONES. These Appellants objected to the admissibility of the Cantox Reports. They stated that the Revised Cantox Report was not proper rebuttal evidence, having been filed less than a week before the hearing, and they would not have an adequate opportunity to review this new

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18 See: Board's letter, dated October 11, 2002.

19 See: Board's letter, dated November 5, 2002.

20 See: Board's letter, dated November 22, 2002.

21 Capital Health Authority's letter, dated November 25, 2002.

information prior to the Hearing. The Appellants subsequently indicated that they would be seeking an adjournment if the Board were to accept the Cantox Reports.[22]

[20] The Board notified the Parties on November 25, 2002, that it intended to address the admissibility of the Cantox Reports as a preliminary matter at the Hearing and requested the Parties be prepared to present submissions on the matter. The Board also indicated it would hear arguments as to whether an adjournment should be granted.[23]

[21] The Hearing commenced on November 26, 2002. The Appellants argued that neither of the Cantox Reports should be admitted, but if the Cantox Reports were allowed as evidence, the Hearing should be adjourned. The Approval Holder argued that the Appellants had ample time to oppose the admittance of the November 13, 2002 Cantox Report, and as none of them expressed any concerns prior to November 25, 2002, the Cantox Reports should be allowed in as evidence. As for the Revised Cantox Report, the Approval Holder characterized the changes as basically correcting a few calculations and that it was provided as a courtesy.

[22] The Board determined that the Cantox Reports should be accepted as evidence, but we held that the rules of procedural fairness require that the Appellants must have an opportunity to assess the information in the reports prior to the hearing. Therefore, the Board adjourned the Hearing until December 16, 17, and 18, 2002.[24]

H. The Capital Health Authority

[23] The Board also asked the Parties whether the Medical Officer of Health should attend the Hearing to answer questions on behalf of the Capital Health Authority. Although the Director and the Approval Holder did not consider that his testimony would provide any new information to the Board, the Board ultimately determined that the Medical Officer of Health should attend the Hearing when it reconvened.

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[22] See also: Mr. Neil Hayes' letter, dated November 25, 2002. See also Board's letter, dated November 25, 2002.

[23] See: Board's letter, dated November 25, 2002.

[24] See: Adjournment Decision; *Maga et al.* v. *Director, Northern Region, Regional Services, Alberta Environment* re: *Inland Cement Limited* (12 December 2002), Appeal Nos. 02-023, 024, 026, 029, 037, 047 and 074-ID2 (A.E.A.B.).

[24] The Board notified the Medical Officer of Health on November 26, 2002, that the public health issues associated with the Inland Plant are important to all of the Parties, and therefore, the views of the Medical Health Officer for the Capital Health Authority would be considered. The Board requested that the Medical Health Officer to personally attend the Hearing when it reconvened, pursuant to section 95(1) of the Act.[25]

[25] The Hearing reconvened on December 16, 2002, and continued through December 17 and 18, 2002.[26]

II. DISCUSSION AND ANALYSIS

A. Overview

1. Background

[26] The Inland Plant is the second of Alberta's two cement plants to convert to coal in the past two years. The Lafarge Exshaw Plant was given an approval under EPEA to convert from natural gas to coal on October 22, 2001,[27] and that decision was the subject of a number of appeals to this Board.[28] The Inland Plant is also the last plant in Canada to still use natural gas as a fuel source.[29] Coal and petroleum coke appear to be the most commonly used fuels in cement plants worldwide.[30]

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[25] See: Board's letter, dated November 26, 2002. Section 95 (1) of the Act states:

"The Board has all the powers of a commissioner under the *Public Inquiries Act*."

Section 5 of the *Public Inquiries Act*, R.S.A. 2000, c. P-39, provides:

> "The commissioner or commissioners have the same power to enforce the attendance of persons as witnesses and to compel them to give evidence and to produce documents and things as is vested in a court of record in civil cases, and the same privileges and immunities as a judge of the Court of Queen's Bench."

[26] The Medical Officer of Health and the Associate Director of Environmental Health Services for the Capital Health Authority attended the Hearing as requested.

[27] Amending Approval No. 1702-01-02, dated October 22, 2001.

[28] *Kievit et al.* v. *Director, Approvals, Southern Region, Regional Services* re: *Lafarge Canada Inc.* (27 May 2002), Appeal Nos. 01-097, 098 and 101-R (A.E.A.B.).

[29] See: Transcript, dated December 17, 2002, at page 216, lines 10 to 12. See also: Director's Record, Tab 2, Inland Cement Limited Substitution Fuel Project: Application to Amend Existing Approval, dated September 2001, page A-1.

[30] See: Transcript, dated December 17, 2002, at page 245, lines 32 to 36, and page 246, lines 1 to 28.

[27] The Inland Plant is unique because of its location within the city limits of the City of Edmonton, near a number of large residential communities.[31] This unique location has resulted in significant public concern and, as is discussed later in this Report and Recommendations, also heightened the Board's concern. The Inland Plant has operated in its present location since 1955.[32] The Plant was originally located outside of the City of Edmonton, but was annexed in 1982. The Plant has undergone a number of changes, including the installation of its current pre-heater/pre-calciner dry process kiln (the "Kiln") in 1979.[33] The Kiln was designed to burn coal; however, the price of natural gas dropped just prior to construction, so Inland never installed the coal preparation equipment and decided instead to burn natural gas.[34] Inland's current electrostatic precipitator (the "ESP") was also installed in 1979, and not in 1997 as set out in the Approval Holder's Application.[35] The ESP is used to control the emission of particulates from the Kiln's emission stack ("Kiln Stack").[36] In 1997, the Kiln was modified and the capacity was increased from 750,000 tonnes per year to 950,000 tonnes per year. At that time, modifications were also made to the ESP.[37] Inland also installed two high-efficiency cyclones as part of its process. According to Inland, the installation of the

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[31] The communities of Sherbrooke, Dovercourt, Inglewood, Wellington Park, Athlone, Woodcroft, Mayfield, High Park, McQueen and North Glenora. See: EFCL's Submission, dated November 15, 2002, at paragraph 2.

[32] See: Director Record's, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page B-9.

[33] Transcript, dated December 17, 2002, at page 213, lines 25 and 26, and page 218, line 1. See also: Director's Record, Tab 3, Inland Cement Ltd. Site Visit, October 17, 2001 – Application No. 008-10339.

[34] Transcript, dated December 17, 2002, at page 214, lines 5 to 9.

[35] See: Director's Record, Tab 2, Inland Cement Response to Supplemental Information Request 1 – January 18, 2002, at question 76.

[36] See: Director's Record, Tab 3, Inland Cement Limited – Substitution Fuel Project, Application No. 008-10339 Review of Key Decisions and Outcomes, at page 7, which provides:

> "Inland Cement uses an electrostatic precipitator in conjunction with high efficiency cyclones for the collection of raw material and for the removal of particulate entrained in the kiln exhaust gases. Inland currently uses a four field plate-wire electrostatic precipitator. The wires create an electrical field and as the exhaust gas passes through the ESP, the particulates are charged and then migrate towards a collection plate. The particulate on the collection plates is then knocked loose and collected in hoppers."

The Director's report documenting his team's site visit to the Inland Plant noted with regard to Inland's ESP that: "The first bank of the ESP is not charged." See: Director's Record, Tab 3, Inland Cement Ltd. Site Visit, October 17, 2001, 11:30-14:00, at page 2.

[37] See: Transcript, dated December 17, 2002, at page 214, line 36 and page 215, lines 1 and 2.

cyclones resulted in a 25 percent reduction in the dust load to the ESP.[38] But, as we heard, the residents' complaint continued.

[28] The fact that the ESP has had a poor historical operating record with respect to dust control is undisputed. The poor operation of the ESP has resulting in numerous "dusting" incidents, following which the Approval Holder has handed out car wash vouchers and cleaning materials to local businesses, workers, and residents.[39] Dust from the Plant was identified as a historic and ongoing problem for residents of the communities located to the southeast, particularly in Sherbrooke and Dovercourt where dust coats homes and automobiles, both inside and out.[40] These dusting incidents have been related, in part, to situations in which there has been an ESP "trip".[41]

2. The Substitution Fuel Project

[29] As is discussed in more detail below, rising natural gas prices in 2000 resulted in Inland developing the Substitution Fuel Project and beginning the process of seeking approval from the Director for an amendment to their Approval to permit them to use coal instead of natural gas as a fuel source.

[30] On August 17, 2000, Inland provided Alberta Environment with a letter of intent describing its Substitution Fuel Project.[42] The Director referred Inland's proposal to the

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[38] See: Director's Record, Tab 3, Inland Cement Limited – Substitution Fuel Project, Application No. 008-10339 Review of Key Decisions and Outcomes, at pages 15 and 16.

[39] See: Transcript, dated December 17, 2002, at page 294, lines 29 to 33, and page 295, lines 1 to 9. See also: Director's Record, Tab 2, Inland Cement Limited, Public Disclosure Document, dated November 14, 2000, Appendix III, Record of Dusting Incidents from Plant Upsets (1997-2000).

[40] See: Transcript, dated December 17, 2002, at page 135, lines 30 and 31, and page 136, lines 1 to 27. See also: EFCL's Submission, dated November 15, 2002, and Statements of Ms. Anna Krug, Ms. Bonnie Quinn, and Mr. Daryl Ranks.

[41] "An ESP trip occurs when the ESP is de-energized to minimize the potential for dangerous incidents caused by the presence of high levels of combustible gases or other unsafe operating conditions. During a trip, the particulate removal efficiency of the ESP declines substantially and significant levels of particulate matter are released in a very short period of time (approximately 2 minutes on average)."

See: Director's Submission, dated November 15, 2002, at page 19, paragraph 90.

[42] Director's Record, Tab 3, Background Material On Cement Plants and Summary of the Inland Cement Limited Amendment Application Review, Alberta Environment, May 2002, at #3 report entitled "Application No. 008-10339 – Chronology of Regulatory Review Process."

Environmental Assessment Director to establish if the project needed a further assessment.[43] The Environmental Assessment Director determined that the potential environmental impacts required a further assessment of the Substitution Fuel Project be undertaken, and notification of this decision was published in the *Edmonton Journal* and the *Edmonton Sun*. The notice stated that persons directly affected could submit Statements of Concern to the Environmental Assessment Director.

[31] On November 14, 2000, Inland released a Public Disclosure Document[44] and began providing information regarding the Substitution Fuel Project on its website.[45] During November and December 2000, Inland held four Stakeholder Consultation workshops to identify issues to be addressed in the Fuel Substitution Project.[46] Inland further stated that it held three public open houses, one open house for employees, and it continued to meet with "…Community Leagues, environmental groups, Edmonton and St. Albert City Councils, and other groups who request meetings…."[47]

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[43] On October 25, 2000, Alberta Environment notified Inland Cement that the screening process had been initiated to determine if the completion of an Environmental Impact Assessment (EIA) report would be required. See: Director's Record, Tab 3, Background Material On Cement Plants and Summary of the Inland Cement Limited Amendment Application Review, Alberta Environment, May 2002, at #3 report entitled "Application No. 008-10339 – Chronology of Regulatory Review Process."

[44] Director's Record, Tab 2, Inland Cement Limited Substitution Fuel Project, Edmonton, Alberta – Public Disclosure Document, November 14, 2000. Note that the "Chronology of Regulatory Review Process" provided by the Director in Director's Record, Tab 3, Background Material On Cement Plants and Summary of the Inland Cement Limited Amendment Application Review, Alberta Environment, May 2002, at #3 at page 1, contains an error in reference to the year this Public Disclosure Document was released. It should be 2000, and not 2001.

[45] The project website (www.inlandsubfuel.com) was launched in conjunction with the release of the Public Disclosure Document in November 2000. See: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at pages Q-5 and Q-6.

[46] According to its application, Inland notified eight environmental groups, 13 Community Leagues, 2,100 residents and businesses in the area, members of the West Edmonton Business Association, the Chamber of Commerce, the Capital Region Health Authority, and an advertisement was placed in the *Edmonton Journal* and *Edmonton Sun* newspapers, inviting people to become involved. Those who responded were invited to the workshops. Approximately 12 people attended each workshop. See: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at pages Q-3.2, Q-4.2, Q-4.3, Q- 5 and Q-6.

[47] Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page Q-3. In its application, Inland stated that it notified individuals and businesses of the open houses through maildrops, advertisements placed in the *Edmonton Journal*, *Edmonton Sun*, *Edmonton Examiner*, and the *St. Albert Gazette*, and articles and advertisements in local Community League newsletters. In its application, Inland stated that 168 people attended the open houses in Edmonton, 133 people toured the facility, and 21 people attended the St. Albert open house. See: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page Q-8.

[32] At the Hearing, Inland stated that the open houses were "…fairly well attended…" and the open house at the Yellowhead Inn was also well attended.[48] However, the forums where representatives from Inland were invited to speak, such as those organized by the Community Leagues were "…very poorly attended…."[49]

[33] As a result of increased public awareness of the Project and the continuing concerns of the residents attending a town hall meeting at the Sherbrooke Community Hall, a petition (the "No to Coal Petition") was circulated in local neighbourhoods.[50]

[34] On March 26, 2001, the Environmental Assessment Director issued the Screening Report for the Substitution Fuel Project with the decision that the proposed project did not require an Environmental Impact Assessment ("EIA").[51]

[35] The Appellants were perhaps understandably surprised that an EIA was not required given the obvious level of public concern, the location of the Plant, and the on-going problems of dusting incidents. While the issue of whether an EIA should have been required is not before this Board, it is noteworthy that the Director admitted during the Hearing that he was also surprised that the EIA stopped at the screening stage. He stated "…there were some surprises in terms of, it is rare that I would put forward an item that is a non-mandatory item for review, so there was some surprise on my part …[that an EIA report was not required]."[52]

[36] After the decision by the Environmental Assessment Director was issued, and in response to the number of Statement of Concerns filed with the Director, Alberta Environment held a community meeting in May 2001.[53] Approximately 200 to 250 people attended this meeting as well as representatives from Alberta Environment, local MLAs, and the Minister of Environment.[54] Inland was not invited and did not attend.[55] The "No to Coal" petition, signed

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48 Transcript, dated December 17, 2002, at page 291, lines 16 to 19.

49 Transcript, dated December 17, 2002, at page 291, lines 19 to 22.

50 See: EFONES' Submission, dated November 15, 2002, Statement of Mr. Robert T. Krug; and EFCL's Submission, dated November 15, 2002, Statement of Ms. Bonnie Quinn at pages 2 to 3.

51 See: Director's Submission, dated November 15, 2002, at paragraphs 5 to 9.

52 Transcript, dated December 18, 2002, at page 522, lines 12 to 22.

53 See: Transcript, dated December 17, 2002, at page 142, lines 13 to 20. It appears that Mr. Quinn had some role in get this meeting set up.

54 Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page Q-9.

by 1,377 residents of the City of Edmonton, was given to the Minister of Environment at the public meeting. According to the EFCL, there were 2,731 names on the petition by October 2001, and at the time of the Hearing, more than 3,000 signatures were included on the petition.[56]

[37] On August 31, 2001, Inland Cement filed its application for the Substitution Fuel Project with the Director.[57] Included in its application was a description of Inland's public consultation program, undertaken to the date of the application.[58] According to Inland, it participated in a public consultation program to inform and involve residents and others who may be affected by the Substitution Fuel Project, including employees, community leagues, environmental groups, business organizations, and the Capital Health Authority.[59] Inland's consultation strategy was to "…ensure that stakeholders are aware of the [Substitution Fuel] Project first, and then to provide clear, concise avenues for people to ask questions, obtain information, and provide their input to Inland."[60] In its application, Inland stated that its goals for the consultation program were:

> "• to have an open and well-documented process;
>
> - to consult key stakeholders on the design of the consultation program so that it is most effective in involving them;
> - to ensure that all interested and potentially affected parties receive information on the [Substitution Fuel] Project in a timely manner;
> - to provide effective, simple, friendly avenues for people to receive information and share their views;
> - to ensure public input is used to identify and resolve issues and concerns throughout [Substitution Fuel] Project planning; and
> - to build on and strengthen Inland's relationships with its neighbours and

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55 See: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page Q-9.

56 See: EFCL's Submission, dated November 15, 2002, at paragraph 12.

57 See: Director's Record, Tab 3, Background Material On Cement Plants and Summary of the Inland Cement Limited Amendment Application Review, Alberta Environment, May 2002, at #3 report entitled "Application No. 008-10339 – Chronology of Regulatory Review Process."

58 See: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page Q-1.

59 See: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page Q-1.

60 Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page Q-2.

stakeholders."[61]

[38] On September 5, 2001, the Notice of Application was published in the *Edmonton Journal*, and a 45-day period commenced for people who were directly affected by Inland's application to file a Statement of Concern with the Director.[62] On May 24, 2002, the Director issued the Approval, allowing Inland to use coal as a fuel source and, among other things, to continue to operate its existing particulate control device, their ESP, on its Kiln Stack.

[39] During the course of the Director's review of Inland's application for its Substitution Fuel Project, Inland worked to reduce the number of ESP trips resulting in reportable incidents. Largely on the basis of this reduction in ESP trips, the Director permitted Inland to continue to operate its existing ESP, notwithstanding the conversion to coal as a fuel source. The Approval issued by the Director on May 24, 2002, set forth an incremental reduction in the annual allowable number of authorized trips for ESP.[63] The Approval specifies that if Inland exceeds the authorized number of trips, the ESP must be replaced with a fabric filter system, commonly known as a baghouse, within 20 months from the time of the exceedance.[64]

[40] At the Hearing, when the Director was questioned about the approval process, his response to the public concern that was expressed, and contacting the individuals who filed Statements of Concern, the Director stated that he does not go out and actually talk to the people.[65] He stated he did not speak to a single resident in the adjacent communities who filed a Statement of Concern.

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61 Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page Q-1.

62 This 45-day period ended on October 22, 2001. See: Director's Record, Tab 3, Background Material On Cement Plants and Summary of the Inland Cement Limited Amendment Application Review, Alberta Environment, May 2002, at #3 report entitled "Application No. 008-10339 – Chronology of Regulatory Review Process." The advertisement was also placed in the *Edmonton Sun.*

63 Director's Record, Tab 1, Approval No. 10339-01-03, dated May 24, 2002. Approval condition 4.1.31 provides: "The frequency of ESP trips, except during the initial commissioning period, shall not exceed the limits specified in TABLE 4.1-E" Table 4.1-E sets forth an incremental reduction in the number of authorized ESP trips. These are ten trips for 2003, eight trips for 2004, and six trips for 2005 and every year thereafter. Five additional trips are allowed during the first 90 days after switching to coal fuel as part of the commissioning process.

64 Director's Record, Tab 1, Approval No. 10339-01-03, dated May 24, 2002. Approval condition 4.1.37 provides that the baghouse must be fully operational within 20 months of exceeding the limits specified in Table 4.1-E, unless otherwise authorized in writing by the Director.

65 See: Transcript, December 18, 2002, at page 503, lines 32 to 34 and page 504, lines 1 to 30 where it states:

3. Organization of the Report and Recommendations

[41] Notwithstanding the public consultation program undertaken by Inland, the reduction in the number of trips, and the considerations of the Director, many members of the public and the Appellants before this Board remain very concerned about the use of coal as a fuel source at Inland and the possible effects of the emissions of the Plant. The main concerns expressed by the Appellants and the main issues at the Hearing were: (1) the potential health impacts of emissions from the Plant, including those resulting from the switch to coal as a fuel source, (2) the Director's decision to allow the Approval Holder to convert to coal as a fuel source, (3) the "inadequate" operation of the ESP, and (4) the Director's decision to allow the Approval Holder to continue operating its existing ESP and to conditionally delay installation of a baghouse.

[42] While there were a number of issues identified for inclusion in the hearing, as set out in our preliminary decision,[66] as is often the case, several of these issues were clearly more of a concern and others are interrelated in such a manner that they can not be addressed in isolation from one another. The Board will begin by addressing the most immediate concern of the Appellants: human health. The Board will then turn to a consideration of the need for

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> "Mr. Fitch: And you could confirm to me that of all of statements of concern that you received on this project, you didn't in any single case take the initiative once or any of your staff, that is once you had read one of these statements of concern, to actually pick up the phone if something you read interested you and contact that person and try to find out maybe a little bit more about why they were concerned. And again I am sorry to be giving all the evidence here, but I am trying to finish here quickly.
>
> As I understand the process, what Alberta Environment does is it receives them, it sort of categorizes them, I think Ms. Sartori said breaks it down by issue, and then internally addresses each issue but it never ever goes out and actually talks to people to try to get elaboration or something on those issues.
>
> Mr. Singh: It can vary under circumstance. Sometimes we do have to go back to persons, ask them to clarify what their concerns were. At times there can be other approaches taken, but on a formal kind of basis it is by written correspondence in the manner that you have described.
>
> Mr. Fitch: In this case, last question, you can confirm that you didn't contact any individual citizen that sent in a statement of concern other than sending a letter of acknowledgment that you received the statement of concern and the letter at the end of the day saying we have issued our decision?
>
> Mr. Singh: In terms of us proactively contacting persons, not verbally unless we require clarification from anyone, no, we did not do that."

[66] See: Preliminary Issues: *Doull et al.* v. *Director, Northern Region, Regional Services, Alberta Environment* re: *Inland Cement Limited* (11 October 2002), Appeal Nos. 02-018-041, 047, 060, 061, 073, and 074-ID1 (A.E.A.B.).

conversion to coal. The Board will then look at the concerns regarding the operation of the ESP. Following this, the Board will turn to the issue that took the most time at the hearing, the consideration of Best Available Demonstrated Technology ("BADT") (the ESP vs. the baghouse). Finally, the Board will consider the other issues previously identified as being included within these appeals.

B. Human Health

[43] The issue that fundamentally underlies all of the other concerns put forward by the Appellants is human health. The Appellants have health concerns relating to both the ongoing dusting problems resulting from the Plant, and with the switch in the fuel source to coal. The Board believes that Mr. Hayes most eloquently summarized this underlying concern for human health when he told the Board the main reason that he filed an appeal was to protect his children. Mr. Hayes stated:

> "The reason that I asked to be involved was to protect my children, as I have mentioned, Julianne who is 10 and Derek who is 7. And as I was putting my daughter to bed last night, she indicated something to me which I think was somewhat a wise comment, and I think I would like to share it with the Board. She said, Daddy, wouldn't it be great if Inland was forced to put together a new filter and not allow it to burn coal. I said yes, that would be great. I would be really happy. That would be a great Christmas present, wouldn't it? She said yes, and she said that would make the air really clean, wouldn't it, Dad? I said, yeah, it would definitely improve the air quality and it would make it better for us where we live. I debated even bringing her out today."[67]

[44] The Board believes the Appellants and other residents are justified in raising these concerns. The decision to authorize the switch in the fuel source at the Inland Plant from natural gas to coal is a significant decision, especially in light of the location of the plant up-wind of and adjacent to a large city, the poor performance of the ESP in the past, and the public concern regarding particulate and metal emissions. The Board was of the view that the issue of human health was so important that we took the step of requesting the Medical Officer of Health for the Capital Health Authority to attend the Hearing and answer the questions posed by the Parties and the Board. The Board takes this opportunity to thank Dr. Predy, the Medical Officer of Health, for his assistance.

[45] While the Board takes some issue with the evidence that has been presented by the Parties, the Board is fundamentally of the view that the use of coal as a fuel source, subject to appropriate particulate emission controls, is an acceptable choice for the Inland Plant. The Board notes that there are potential health concerns – related to unacceptable levels of fine particulate emissions – that must be properly mitigated as part of this project in order to ensure the protection of the Appellants and residents in the area.

1. Hearing Submissions

[46] The Appellants raised several concerns with respect to human health. These included the adequacy of the health impact assessment, the appropriateness of requiring a human impact assessment update once the conversion to coal is completed, and several concerns about the impact of emissions on human health.

[47] With respect to the adequacy of the health impact assessment, the Appellants expressed concern that the Director allowed the Substitution Fuel Project to proceed even though it could potentially result in an increase in substances that are of concern to human health or are known to be harmful, thus placing the Appellants and their families at risk.[68] EFONES expressed concerns that the Director did not require a reassessment of the health risks with the increased metal emissions.

[48] EFONES presented Dr. Michael Brauer as a witness to support their position. According to Dr. Brauer there are a range of health concerns arising from the emissions and with respect to particulate matter there is "no threshold (no safe level of exposure) for a population."[69]

[49] EFONES also presented Dr. Brian J. Sproule to provide evidence on the effect particulates may have on human health. According to Dr. Sproule, particulate matter, especially

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67 Transcript, December 18, 2002, at page 540, lines 4 to 19.

68 See: Mr. Neil Hayes' Submission, dated November 15, 2002, and EFONES' Submission, dated November 15, 2002. EFONES stated that the burning of coal could potentially increase emissions of substances that are of concern to human health, including "…fine particulate matter, heavy metals, polycyclic aromatic hydrocarbons ('PAHs'), and volatile organic carbon compounds ('VOC')…" as well as fluorides and bromides. See: EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraphs 37 and 38.

69 See: EFONES' Submission, dated November 15, 2002, Report of Dr. Michael Brauer, dated November 6, 2002, at page 2, and errata received December 6, 2002.

those particles less than 10 micrometres, can be carried into the smallest airways and could cause an asthmatic reaction, leaving children more susceptible to asthmatic attacks caused by a contaminated atmosphere.[70] EFONES argued that one study at a cement plant showed predicted levels for particulate matter were "…several hundred fold less…" than the actual observed concentrations. They stated: "Modelled or predicted concentration values should therefore not be accepted for health assessments."[71]

[50] EFONES stated that in the application, the Approval Holder compared "…predicted ground level concentrations of airborne substances to occupational exposure limits."[72] EFONES argued the occupational exposure limits are actually guidelines for the control of potential health hazards and are not to be used in the context of addressing community air pollution nuisances or the toxic potential of continuous exposure to the substance.[73] EFONES further argued that this indicates Inland failed to get a qualified industrial toxicologist to provide an opinion on health effects as it had assured the Director it would.[74]

[51] EFONES questioned the validly of some of the results in the screening assessment as the "…screening assessment did not consider exposure to secondary pollutants that may be formed in the cement process (hexavalent Cr) or transformed in the atmosphere (PM precursors

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[70] See: EFONES' Submission, dated November 15, 2002, Report of Dr. Brian J. Sproule, dated November 12, 2002, at page 1. See also EFONES' Submission, dated November 15, 2002, Affidavits of Ms. Gail Maga, dated November 14, 2002, and Mr. Robert T. Krug, dated November 12, 2002.

[71] See: EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraph 44.

[72] EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraph 36.

[73] See: EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraph 36, where she states:

> "The American Conference of Governmental Industrial Hygienists Threshold Limit Value Booklet, which is the origin of most occupational exposure limits, states in its introduction in bold font:
>
> > 'These limits are intended for use in the practice of industrial hygiene as guidelines or recommendations in the control of potential health hazards and for no other use, eg. in the evaluation or control of community air pollution nuisances; in estimating the toxic potential of continuous, uninterrupted exposures or other extended work periods;…'."

[74] EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraphs 35 and 36.

such as SO_2, NO_x, nitro-PAHs, PAN)."[75] EFONES also stated that the Approval Holder did not consider other pathways of exposure to the substances.[76]

[52] The Approval Holder argued that the health impact assessment included in the application was more than adequate, and it was entirely appropriate for the Director to have relied on this assessment. Therefore, according to the Approval Holder, the Director made an informed decision.[77] However, in response to public concerns, the Approval Holder explained that it retained the services of Dr. Gordon Brown of Cantox Environmental Inc. to complete a human health risk assessment (the Cantox Reports), and the Approval Holder argued that Dr. Brown's assessment adequately addresses human health risk concerns.[78]

[53] As a result of the Cantox Reports, the Approval Holder submitted that the health risks associated with using coal or coke are similar to those using natural gas. It further stated that no potential health risks were identified for acute or chronic inhalation exposures to predicted maximums of NO_2, SO_2, and metals. It argued that even though PM_{10} and $PM_{2.5}$ concentrations will exceed health-based reference concentrations during normal and upset conditions at the maximum ground level location, the actual frequency of these concentrations being reached would be very low. It further argued that the concentrations of PM_{10} and $PM_{2.5}$ at residential locations would be lower than the reference concentrations except during upsets.[79]

[54] In the Cantox Reports, it is stated that the most sensitive receptors, including asthmatics, were accounted for in the human health risk assessment.[80] The Cantox Reports also stated that:

> "PM emissions from cement plants may be considered predominately 'crustal' in nature, particularly during upsets, and are therefore expected to be less toxic than PM emissions from a 'combustion' source such as motor vehicle traffic."[81]

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75 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraphs 39.

76 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraphs 42.

77 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 40.

78 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 40 and 41.

79 See: Approval Holder's Submission, dated November 15, 2002, Tab 3C, Cantox Environmental Human Health Risk Assessment of the Lehigh Inland Cement Limited Substitution Fuel Project, at pages 30 to 34.

80 See: Approval Holder's Submission, dated November 15, 2002, Tab 3C, Cantox Environmental Human Health Risk Assessment of the Lehigh Inland Cement Limited Substitution Fuel Project, at page 6.

[55] The Approval Holder stated that only the heavy metal emissions could be influenced significantly by the fuel used. It stated that:

> "Although the mercury concentration in the coal is very low (0.12 and 0.14 mg/kg) the total input and the expected emissions are increased by more than 30% based on a very low initial level. Nevertheless, the emission of the class III elements (Hg, Cd, Tl) remains below 30% of the emission limit. As we have mentioned in our report, the calculated emissions are usually higher than measured concentrations. This is due to the fact that the emission factors used are chosen under pessimistic assumptions which means that short time peaks are taken into account."[82]

[56] The Approval Holder stated that health risks would be more accurately determined using actual data collected from monitoring conducted after the implementation of the Substitution Fuel Project. Inland further stated that:

> "…considering the conservative assumptions in the health risk assessment and the very low predicted frequency of elevated PM concentrations, as well as the conditions required by the Approval, potential health concerns are not expected related to operation of the Lehigh Inland facility with either fuel source."[83]

[57] The Director stated that the Health Team, comprised of staff from Alberta Health and Wellness, the Capital Health Authority, and Alberta Environment, advised him that "…unacceptable human health impacts are not expected as a result of conversion from natural gas to coal…."[84] The Director concluded that the health impact assessment was adequate for the application review process.[85]

[58] The Capital Health Authority confirmed that they were involved in the Health Team established by the Director. They stated that their review of the Substitution Fuel Project consisted of reviewing the information provided to the Director by the Approval Holder and that they provided their comments to the Director on this information through the Health Team. The Board notes that the Capital Health Authority did not have the benefit of hearing the evidence of Dr. Brown and Dr. Sproule, in making its assessment.

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81 See: Approval Holder's Submission, dated November 15, 2002, Tab 3C, Cantox Environmental Human Health Risk Assessment of the Lehigh Inland Cement Limited Substitution Fuel Project, at page 35.

82 See: Approval Holder's Submission, dated November 15, 2002, Tab 5, Technical Report – Substitution Fuel Project in the Edmonton Plant of Lehigh Inland Cement Limited, at page 10.

83 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 42.

84 Director's Submission, dated November 15, 2002, at paragraphs 101 and 102.

85 Director's Submission, dated November 15, 2002, at paragraph 103.

[59] With respect to the requirement set out in the Approval that the Approval Holder complete a health impact assessment update after the conversion to coal is completed, EFONES submitted that this does not allow for the opportunity to "…modify the design or implementation to deal with any effects."[86] They argued the Director did not require the Approval Holder to act on the findings of the assessment.

[60] Inland stated that it is "…committed to performing a health impact assessment update as required by the Approval…" and will work with Alberta Environment to address local residents' concerns of potential health impacts.[87]

[61] The Director submitted that the conditions requiring a health impact assessment update are appropriate and were included upon the advice of the Health Team.[88]

2. Analysis

[62] Dr. Brauer stated in his testimony that: "The science tells us that there is no safe level that has yet been identified for exposure to particulate matter."[89] He was asked to provide the Board with references in support of this statement. He responded by way of an undertaking that consisted of four extracts that make no reference to the absence of a safe level for exposure to particulate matter.[90] These references only note the current lack of evidence to identify a threshold below which no health effects may occur. In response to questioning from the Board, Dr. Brauer clarified his statement about the absence of safe levels as follows:[91]

> "Dr. Hurdey: You talked about no safe level of exposure, and I guess I am wondering, does that mean that only zero risk could be considered safe?
>
> Dr. Brauer: No. I think – I guess my point is that when I see statements that there is no health risk—I think based on the signs that there is a health risk even below – even at very low levels. I guess that is the main point. I think it is impossible to have zero health risk."

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86 EFONES' Submission, dated November 15, 2002, at paragraph 31.

87 Approval Holder's Submission, dated November 15, 2002, at paragraphs 44 and 45.

88 Director's Submission, dated November 15, 2002, at paragraphs 104 to 106.

89 Transcript, dated December 16, 2002, at page 34, lines 23 to 25.

90 Exhibit 20, Undertaking Provided by Dr. Brauer.

91 Transcript, dated December 16, 2002, page 91, lines 27 to 35.

[63] Dr. Brauer presented estimates of predicted long-term health impacts based on his interpretation of the estimated exposures of the community to fine particulate emissions from the Inland Plant using data he derived from the Inland application. In his written statement, Dr. Brauer, stated:

> "Assuming the latter would indicate that Inland emissions result in an average 1.14 μg/m^3 increase in 24-hr PM_{10} for the natural gas scenario, and an average 1.45 μg/m^3 increase for the Fording coal scenario (as one example). Assuming a conservative 4% increase in non-accidental mortality per 10 μg/m^3 increase in annual average PM_{10}00 [sic] (based on Pope, Burnett *et al.* 2002 – the most recent cohort study), the contribution of Inland emissions would be associated with 0.45% and 0.58% increases in total mortality for the natural gas and Fording coal scenarios, respectively. Though the affected population is not clearly indicated in the risk assessment, the maps suggest a conservative estimate of 10,000 people in the vicinity of the Inland facility would be impacted. Using average annual non-trauma death rate of 53/10,000 (Capital Health Region data from Statistics Canada – http://www.statcan.ca/english/freepub/82-221-XIE/01002/healthstatus/deaths3.htm) the impacts on mortality would be an additional 2.4 to 3 deaths per year for the natural gas and Fording coal scenarios respectively. Note the level of "acceptable risk" in Canada (as in the application) is often specified as 1 per 100,000. The impacts noted above correspond to between 24 and 30 excess deaths per 100,000."[92] (Emphasis removed.)

This was corrected at the Hearing by submission of an errata from Dr. Brauer stating:

> "…the impacts on mortality would be an additional 0.24 to 0.3 deaths per year for the natural gas and Fording coal scenarios respectively. Note the level of "acceptable risk" in Canada (as in the Application) is often specified as 1 per 100,000. The impacts noted above correspond to between 2.4 and 3.0 excess deaths per 100,000."[93] (Emphasis removed.)

[64] In addition to the ten fold overestimate of excess deaths attributed to the Inland fine particle emissions, which Dr. Brauer admitted to correcting in response to the error being noted in rebuttal evidence of Dr. Brown, the Board notes other concerns with this analysis, including:

- The Pope *et al*. (2002) reference and the estimated 4 percent increase in mortality for a 10 μg/m^3 increase in particulate concentration was based on $PM_{2.5}$, and Dr. Brauer applied this increase to PM_{10} data causing a further over-estimate of at least a factor of two in his mortality estimates.

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92 EFONES' Submission, dated November 15, 2002, Report of Dr. Michael Brauer, at page 1.

93 EFONES' Submission, dated December 6, 2002, Errata to Dr. Michael Brauer's Report.

- The community receptors selected for the risk assessment were selected to be those closest to the emission source and the estimated impact of Inland emissions were determined at the maximum ground level location (within a few hundred meters of their fence) and at the identified community receptors. Although Dr. Brauer was justified in criticizing the Cantox Reports for not establishing the size of the populations at various ambient particulate exposure levels that were impacted by Inland emissions, it is difficult to visualize a large population located within the radius of elevated annual average air concentrations used in Dr. Brauer's calculations to estimate a number of deaths per 100,000 exposed.[94] Dr. Brauer's response that it could be a million exposed to this level suggests a lack of comprehension that the ambient air concentrations inevitably decrease substantially with increasing distance from the emission source, beyond the point of maximum ground level concentration.[95]
- The exposure response relationship from Pope *et al.* (2002) shows a dramatic increase in the width of confidence interval at ambient concentrations below 15 $\mu g/m^3$ and the relative risk is presented as being below 1 for these lower exposure levels that are in the range of the Edmonton community exposure levels calling into question the calculation done in this case.
- Overall, this calculation and the manner that it was presented to the hearing by Dr. Brauer could be expected to frighten the community but in addition to the substantive errors made, they fail to reflect the considerable

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[94] Transcipt, dated December 16, 2002, at page 36, lines 28 to 34: "I did a very simple calculation earlier which is in the report and, in fact, has been corrected in the errata indicating that there would be some two to three, expected two to three deaths per year per 100,000 people exposed as a result of the expected emissions from this facility."

See also: Transcript, dated December 16, 2002, at page 37, lines 11 to 17: "And, finally, regarding the adequacy of the health risk assessment, nowhere in any of the documentation is it ever stated what population is being considered. Not being entirely familiar with the area, I cannot tell if we were talking about 2 people, 10 people, 100,000, or 1 million people."

[95] See also: Transcript, dated December 16, 2002, at page 63, lines 28 to 36, and page 64, lines 1 to 13:

"Mr. Thomas: Now, you corrected, redid the calculation, and if I can go on to the next sentence in your errata, you state, the impacts noted above correspond to between 2.4 and 3.0 excess deaths per hundred thousand people.

The question I want to ask you is are you assuming, in making that statement, that there are a hundred thousand people who will actually receive the effects of the emissions from this plant burning coal?

Mr. Brauer: No, I am not, and again I don't have the information on exactly how many people we are talking about here.

Mr. Thomas: So you wouldn't want to leave the impression that 100,000 people will actually see the effects from this particular plant?

Mr. Brauer: It could be a million people. Essentially the entire population of Edmonton is potentially impacted unless there is some evidence to indicate otherwise, and again, I don't have that information to tell you where to draw the lines."

uncertainty that makes the presentation of such a calculation to the public highly suspect.

[65] In summary, the Board gives little weight to the opinion of Dr. Brauer that emissions from the Inland will cause or contribute to increased *mortality* among residents in the neighbouring community. Despite that finding, the Board accepts that there is currently no evidence available to define a threshold level below which no health effects from exposure to fine particles in air will occur. Likewise, the Board finds that the body of evidence in support of health concerns in the population arising from exposure to fine particulates provides a credible case for minimizing population exposures to these pollutants. Dr. Brown, health risk expert for the Approval Holder, albeit in response to questioning by the Board, concurred with the existence of the body of evidence.[96]

[66] The Approval Holder attempted to assert that very little of the Kiln Stack emissions is actually $PM_{2.5}$. Mr. Rawlings (the Approval Holder's witness who spoke to air

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[96] See: Transcript, dated December 17, 2002, at page 352, lines 19 to 33 and page 352, lines 1 to 28:

"Dr. Hrudey: We are almost there. Considering your considerable experience in the environmental toxicology field, I am wondering if I asked you to identify one environmental pollutant which Canadian urban residents are commonly exposed to that has the largest body of credible evidence for human health effects, what would you choose?

Dr. Brown: Probably sulphur dioxide.

Dr. Hrudey: For human health effect in Canada?

Dr. Brown: Yes.

Dr. Hrudey: What effects do you have in mind for that?

Dr. Brown: Sulphur dioxide, the respiratory effects.

Dr. Hrudey: And where, in Canada, are these exposures happening?

Dr. Brown: In Alberta. Alberta has a lot of H2S in the oil and gas industry, so sulphur dioxide is a very air common pollutant around oil and gas facilities.

In addition, we have sulphur in coal, so anything that burns coal, power plants, coal-fired power plants, the oil sands plants of course there is sulphur in the bitumen so sulphur dioxide is a very studied pollutant in Alberta and probably one of the most studied.

Dr. Hrudey: I realize it is late in the day for all of us so you probably didn't hear my question, but I will repeat it to you because there was an important qualifier in there. I said, if I asked you to identify one environmental pollutant to which Canadian urban residents commonly exposed that has the larges body of credible evidence for human health effects, what would you choose?

Dr. Brown: Well, certainly there has been a lot of study of particulate matter and there is a credible body of evidence related to particulate matter. I think that if that is sort of the pollutant that you would like me to focus on, you know.

Dr. Hrudey: I am not trying to steer you anywhere, I just want to know what you think.

Dr. Brown: There is a large amount of very recent information on particulate matter in urban areas."

quality)[97] testified regarding the air quality data that was provided for the preparation of the Cantox Reports:

> "The focus of this work was to provide realistic estimates of off-site and community concentrations during normal operations and periods when the ESP was not operating at its full capacity. As such, the modelling did not include many of the highly conservative assumptions used in preparing the application. However, the modelling results utilized by Cantox remain conservative. The likely air concentrations in and around Inland, the Lehigh Inland facility, are expected to be near or lower than the numbers used by Cantox in their human health risk assessment."[98]

[67] The Board notes that earlier, Mr. Rawlings testified that: "The modeling was based on the highly conservative assumption that 64 percent of the particulate matter emitted from the kiln was in the $PM_{2.5}$ size range. However, actual measurement indicated that $PM_{2.5}$ made up less than 5 percent."[99] Despite the latter statement, it is evident that the 64 percent figure for $PM_{2.5}$ was provided for the Cantox Reports for the purposes of providing "…realistic estimates of off-site and community concentrations…."

[68] Subsequently, under cross examination by the EFCL, Mr. Rawlings testified:

> "This year, Inland have done a series of stack tests where they've looked at particle - sized distributions coming out of the kiln stack. The latest of these records that was shown to me today showed that – or, sorry, yesterday – showed that less than half a percent on the latest test which was conducted late September and the report was published late October was smaller than the 2.5 fraction. Approximately 86 percent of the total particulates was PM_{10}."[100]

[69] Dr. Hoenig (one of the Approval Holder's witnesses)[101] was asked about a report[102] that he had done for Inland for the original application:

> "Mr. Fitch: Do you remember saying at page 7 because of the low total particulate concentration in the exhaust gas of the Edmonton plant, the content of fine particles, $PM_{2.5}$, in the total particulate emissions will be relatively high?

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97 Mr. Rawlings is with Golder Associates Limited.

98 Transcript, dated December 17, 2002, at page 226, lines 24 to 35.

99 Transcript, dated December 17, 2002, at page 223, line 36 and page 224, lines 1 to 6.

100 Transcript, dated December 17, 2002, at page 305, lines 31 and 32, and page 306, lines 1 to 8.

101 Dr. Volker Hoenig is Head of the Environmental and Plant Technology Department of the Research Institute of the German Cement Industry.

102 See: Approval Holder's Submission, dated November 15, 2002, Tab 5, Technical Report UBt-TB – 0125/200 Substitution Fuel Project in the Edmonton Plant of Lehigh Inland Cement Limited.

Investigations of particle emissions behind electrostatic precipitators shows that $PM_{2.5}$ content is about 50 to 70 percent?"

Dr. Hoenig: This is the result of one measurement behind something in Germany.

Mr. Fitch: That is where that came from? That had nothing to do with the Inland plant?

Dr. Hoenig: Correct."[103]

[70] Upon producing the report[104] of the testing that Mr. Rawlings relied upon to describe $PM_{2.5}$ as being less than 5 percent of the total PM,[105] it became apparent that Mr. Rawlings had no first hand knowledge of this report until the day before and was not able to defend its content or explain errors. Likewise, this single result is not consistent with his earlier statement: "This year, Inland have done a series of stack tests where they looked at particle size distributions coming out of the kiln stack." If there were a series of tests to support the 5 percent figure, they should have been produced. Given that between Dr. Brown and Mr. Rawlings the entire discussion about PM was directed towards discounting any concerns about PM other than $PM_{2.5}$, this issue was surely too important to have ignored data showing such low levels of PM relative to the estimate (that makes sense) from Dr. Hoenig and the reference value of 64 percent that Mr. Rawlings testified that he had taken from the U.S.E.P.A. AP42 document.[106]

[71] Dr. Brown made the inference that the fine particulate matter emitted from cement kilns could be disregarded as a health concern because such particles were crustal in nature.[107] However, when questioned about the source of this knowledge, the question was referred to Mr. Rawlings who in turn referred to a draft U.S.E.P.A. document as the source of that information.[108] The document in question, entitled "U.S.E.P.A. Third External Review

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103 Transcript, dated December 17, 2002, at page 306, line 13 to 24.

104 See: Exhibit 19.

105 See: Transcript, dated December 17, 2002, at pages 316 to 322.

106 See: Exhibit 20.

107 See: Approval Holder's Submission, dated November 22, 2002, Rebuttal Affidavit of Mr. Gordon Brown, dated November 21, 2002, at page 39: "PM emissions from cement plants may be considered predominantly 'crustal' in nature, particularly during upsets, and are therefore expected to be less toxic than PM emissions from a 'combustion' source such as motor vehicle traffic."

108 See: Exhibit 21. See also: Transcript, dated December 17, 2002, at page 347, lines 23 to 34, page 348, and page 349, line1:

"Dr. Hrudey: Back to you, Dr. Brown. You stated that the PM emissions may be considered crustal in nature and I guess my question is who is considering them crustal in nature?"

Draft of Air Quality Criteria for Particulate Matter (April 2001)",[109] is a draft document with instructions: "DRAFT – DO NOT QUOTE OR CITE". Although this a standard qualifier placed on U.S. EPA draft documents, some of which have never been finalized, this qualifier makes it difficult to place substantial reliance upon the document for a decision to be made now. Another relevant concern is that the passages that appear to apply to Mr. Rawlings' assertion are general in nature, with no elaboration or citation of any original data source, leaving the impression that the general statements could be opinions rather than documented facts. The Board finds that the argument that particulate matter emitted from the Inland Kiln Stack is both coarse and primarily crustal in nature is *not* convincing. In any case, the Board notes that the Canadian Environmental Protection Act Federal/Provincial Working Group on Air Quality Objectives and Guidelines concluded in their Science Assessment Document:

> "Overall, these studies support the hypothesis very well that the fine particle fraction is more important as a predictor of toxicity than the coarse fraction. However, coarse particles have not yet been eliminated from consideration and

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Dr. Brown: I am to say, sorry, I have to go back to Mr. Rawlings on this one as well.

Mr. Rawlings: Dr. Brown asked us about the nature of the emissions from Inland, the particulates, whether they were crustal, whether they were combustion, and I think for a cement plant it is not an immediately obvious answer because of the temperatures at which the kiln operates. There is evidence from some USEPA reference documents published this year that emissions from cement plants are in fact crustal. USEPA had identified that a number of the emissions at the site are dealing with the handling, transport and processing of feed materials and all of those would likely be crustal in nature because they fit into the definition of what we consider crustal dust; limestone, clay, materials of that nature.

Dr. Hrudey: I guess my interest is in the emissions from the kiln stack, and do I take it the answer is that you consider them to be crustal or we haven't got any references from any other authority, or have you any measurements at Inland Cement to document the crustal?

Mr. Rawlings: There are no measurements at Inland Cement. There have been a number of documents out there talking about other high temperature sources and one that is often cited is a paper by Dr. Vidam out of U.B.C., and I can get that reference for you, that cites volcanic dust as behaving more like crustal behaviour than combustion sources, and certainly volcanic dust is also a very high temperature process where raw materials, are if you want, going to be coming out into the atmosphere. There is no specific other than the USEPA document that I talked about, and we can track down that reference for you,USEPA that identified cement kilns as being either crustal or combustion.

Dr. Hrudey: Either/or but they haven't said what proportion?

Mr. Rawlings: The EPA had indicated that cement processing was crustal, that EPA document.

Dr. Hrudey: I think we would like to see that produced.

Mr. Rawlings: Certainly. we will undertake to get the excerpts from that document."

[109] Exhibit 21.

there is some indication they may play a role in cardiovascular disease and COPD [(chronic obstructive pulmonary disorders)].”[110]

[72] The Board accepts as credible the concerns expressed by Dr. Sproule about short-term health effects, particularly among asthmatics arising from peak exposures to particulate matter to be a very relevant consideration given the documented and predicted peak exposures that have arisen from ESP trips. Short-term health effects from very high exposures to fine particulate matter were acknowledged as a concern by Dr. Brown.[111] The Board disregarded as not helpful Dr. Brown’s references to occupational exposure limits off the Inland property because the company maintains no health monitoring program or any other means of protecting the employees of others. Furthermore, the region immediately to the southeast of the Inland plant, in the path of the prevailing wind, is commercial and light industrial so that office workers,

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[110] EFONES’ Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, Exhibit B, at page 13.

[111] Transcript, dated December 17, 2002, at page 325, lines 27 to 34, page 326, and page 327, lines 1 to 4:

“Mr. Schulz: Thank you very much. Dr. Brown, in your graph, the ES-13, it shows a predicted max off-site reading, of this logarithmic scale. I think as you had indicated, but it is in the order of what I would say probably 300 or so micrograms per cubic metre.

Dr. Brown: What was the question?

Mr. Schulz: I am just saying that the predicted number that I see in there is in the order of 300 micrograms per cubic meter.

Dr. Brown: It is kind of hard to tell the numbers in the report but it is in that range.

Mr. Schulz: In that order. What I am wondering about is what potential impact those kind of readings, now recognizing this is the maximum calculated, so the frequency is not likely to occur very often. But what I am curious on, if you have that high spikes even if it is for short-term, I wonder whether you could help me understand what the toxicological implications would be.

Dr. Brown: Well, the first point that I would like to make is that this is the maximum predicted off-site concentration so this does occur in the immediate vicinity of the site only during an upset.

Now, the distance from the facility I can’t really address. I have asked Golder about this. It would appear that these maximum predicted concentrations during an upset would occur within a few hundred meters of the Inland facility. This is a heavy industrial area, transitioning to a commercial area and the residential area is two approximately kilometers away. So this would occur within an industrial commercial area.

For a short period of time these upsets occur for a maximum of ten minutes, as I understand it, and I think that you know it is really maybe not representative to compare these maximum predicted concentrations occurring in a heavy industrial area with an exposure limit that is protective of public health. It may be more appropriate to look at an occupational exposure limit, for particulate matter is 5,000 micrograms per cubic meter, so this would be well below that number.

Mr. Schulz: For the general population, the different sensitivities, would it have a potential irritant effect at least?

Dr. Brown: Absolutely, yes, there would. There could be an irritant effect.”

for example may be those who are exposed to high concentrations downwind of the maximum ground level concentration. Finally, and most importantly, the concentration that Dr. Brown was being queried about from Figure ES-13 in his report, was a maximum 24-hour concentration even though it may arise from a ten minute peak emission. The maximum 1 hour concentration that was predicted at any of the community receptor locations during ESP upset conditions (meaning that even higher values than these would be expected to prevail in the commercial and light industrial zone) were reported by the Approval Holder to be *substantially* higher:

- 2502.4 $\mu g/m^3$ for TSP;
- 2106.4 $\mu g/m^3$ for PM_{10}; and
- 1584.7 $\mu g/m^3$ for $PM_{2.5}$.

These latter numbers were considered to be more realistic predictions than the numbers submitted with the original application.[112]

[73] In summary, having regard to all of the evidence presented, the Board concludes that there are credible potential health concerns relating to the lack of evidence available to define a threshold level below which no health effects from exposure to fine particles in air will occur and short-term health effects, particularly among asthmatics, arising from peak exposures to particulate matter. The Board finds that the evidence provides a credible case for minimizing population exposures to fine particulate matter. As a result, while the Board believes that the use of coal as a fuel source is an acceptable choice for the Inland Plant, the Board is of the view that additional mitigation measures, including the installation of a baghouse as is discussed below, must be taken as soon as possible to provide additional protection to the Appellants and the local residents.

[74] The Board believes that with the successful implementation of the baghouse on the Kiln Stack, that the peak emission levels will be reduced substantially from the current situation with ESP trips and periods of reduced ESP efficiency, even with those incidents being reduced. Taken together with the substantial reduction that should be achieved in fugitive emissions as a result of the measures introduced by the Director in the Approval, which is also

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[112] See: Director's Record: Tab 3, E-mail from Ms. Anita Sartori to Tony Mak, dated May 2, 2002: "Also Table 3 represents the concentration when an upset occurs for 10 minutes. In the original application, the modeling was completed assuming that the ESP trip occurred for 60 minutes which was very conservative and unrealistic."

discussed below, the Board believes that the cause for concern about human health impacts in the community will be substantially removed. However, given the long track record of poor emissions performance by the Approval Holder that was revealed in the evidence and the levels of concerns about health that these circumstances have raised in the community, there is a need to perform a health risk assessment that will use the actual emissions after the installation of the baghouse and the ambient monitoring data following the conversion to coal. The community should be involved in setting the terms of reference for this human health risk assessment. The value of such community input was acknowledged by Dr. Brown who performed the most recent human health risk assessment on Inland air emissions.[113]

[75] Finally, the Board also believes that it would be a useful exercise for Alberta Environment, Alberta Health and Wellness, the Capital Health Authority, the Approval Holder, and local residents to meet, along with other stakeholders, to discuss the possibility of a regional health study similar to studies carried out in the Fort McMurray and Lake Wabamun areas.[114]

C. The Need for Conversion to Coal as a Fuel Source

[76] The next major argument presented by the Appellants was that the Director did not properly consider reasons underlying Inland's need for the conversion to coal as a fuel source. Effectively, the Appellants contend that the Director has traded their environment for the profitability of Inland. This argument goes to the heart of EPEA. One of the fundamental

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[113] Transcript, dated December 17, 2002, at page 343, lines 33 and 34 and page 344, lines 1 to 34:

"Dr. Hrudey: That is a logical lead-in to my follow-up on that. the first step being problem formulation. Would there be any benefit in a set of circumstances like this to include the people who think their health is being affected in the problem formulation stage?

Dr. Brown: Well, yes. Certainly public consultation is part of the process. It is an important part of the process. In this particular case, I got involved very late in the process. This project had been going on for a couple of years and it was at a situation where I was sort of required to get up to speed very quickly and come up with estimates of risk based on available data, and so I worked very closely with Lehigh Inland and with Golder Associates, and used standard risk assessment methodology which involved hypothetical receptors and exposure limits that are set you know to be protective of health including sensitive individuals in the assessment.

Dr. Hrudey: So, could I take it from that answer that given more time, say some future evaluation of health effects, your preference would be to involve the public in the problem formulation stage so that you were satisfied that your health risk assessment would address their concerns?

Dr. Brown: That's true."

[114] Transcript, dated December 18, 2002, at page 401, lines 10 to 34 and page 402, lines 1 to 13.

responsibilities of the Director and this Board are to balance the various competing interests outlined in section 2 of the Act. [115] Having regard to all of the evidence presented, and balancing all of the various interests outlined in section 2 of the Act, the Board believes that, *with* proper pollution abatement controls and proper mitigation measures, the use of coal as a fuel source for the Inland Plant is an acceptable choice.

1. Hearing Submissions

[77] Several Appellants argued that the Approval Holder is only interested in profits and not the health of those who live in the neighbourhood.[116] EFONES stated that the Director did not require the Approval Holder to "…consider alternatives to the conversion to coal to achieve its economic goals." [117] Mr. Hayes stated the Approval Holder needs to "…show by example that they can balance environmental concerns with economic sustainability."[118]

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[115] Section 2 of EPEA provides:

"The purpose of this Act is to support and promote the protection, enhancement and wise use of the environment while recognizing the following:

(a) the protection of the environment is essential to the integrity of ecosystems and human health and to the well-being of society;

(b) the need for Alberta's economic growth and prosperity in an environmentally responsible manner and the need to integrate environmental protection and economic decisions in the earliest stages of planning;

(c) the principle of sustainable development, which ensures that the use of resources and the environment today does not impair prospects for their use by future generations;

(d) the importance of preventing and mitigating the environmental impact of development and of government policies, programs and decisions;

(e) the need for Government leadership in areas of environmental research, technology and protection standards;

(f) the shared responsibility of all Alberta citizens for ensuring the protection, enhancement and wise use of the environment through individual actions;

(g) the opportunities made available through this Act for citizens to provide advice on decisions affecting the environment;

(h) the responsibility to work co-operatively with governments of other jurisdictions to prevent and minimize transboundary environmental impacts;

(i) the responsibility of polluters to pay for the costs of their actions;

(j) the important role of comprehensive and responsive action in administering this Act."

[116] See: Mr. Neil Hayes' Submission, dated November 15, 2002, and EFONES' Submission, dated November 15, 2002.

[117] EFONES' Submission, dated November 15, 2002, at paragraph 34.

[118] Mr. Neil Hayes' Submission, dated November 15, 2002.

[78] EFONES stated that the Director did not request information or justification of the financial reasons for the conversion, and that since the Approval Holder raised it as the reason for the conversion, the Director should have balanced "…that benefit with the burdens that were imposed on others."[119] EFONES argued that even though it may be difficult for the Approval Holder to remain competitive, it does not justify "…untold, undocumented, unknown expense to the public in health care costs and health misery, or the effect on quality of life and, for that matter, the decline in real estate values." [120] They further argued that a condition should have been included in the Approval requiring the Approval Holder to use natural gas when it is competitive with coal, and documentation should be provided and be subject to an independent review to prove the Approval Holder's contention.[121]

[79] The Approval Holder argued that without the flexibility to use coal as a primary fuel source, the Plant would be rendered non-competitive in the industry.[122] It argued that the nature of supply and demand within the cement industry requires that producers of cement maintain low cost operations. The Approval Holder stated that its Plant is the only remaining plant operating in Canada that uses natural gas as the primary fuel. Notwithstanding its submissions in this regard, the Approval Holder argued that the "…*Environmental Protection and Enhancement Act* does not require the Director to conduct a detailed evaluation of an applicant's economic and competitive market reasons for bringing an application."[123]

[80] The Director responded that the application review process does not require a detailed evaluation of the economic and competitive market reasons for an application. The Director concluded that he "…had addressed the issue of the need for conversion to coal as a fuel source appropriately."[124]

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119 EFONES' Submission, dated November 15, 2002, at paragraph 74.

120 EFONES' Submission, dated November 15, 2002, Affidavit of Mr. James O. Darwish, dated November 13, 2002, at paragraph 5.

121 See: EFONES' Submission, dated November 15, 2002, Affidavit of Mr. James O. Darwish, dated November 13, 2002, at paragraph 14, and Affidavit of Mr. Robert T. Krug, dated November 12, 2002.

122 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 49.

123 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 51.

124 Director's Submission, dated November 15, 2002, at paragraph 111.

2. Analysis

[81] As stated, the Board points out that the Director, in issuing approvals under EPEA must do so in accordance with the purposes set out in section 2. Of particular relevance in the current appeal are sections 2 (a), (b), (d), (e), and (i) of the Act, which provide:

> "The purpose of this Act is to support and promote the protection, enhancement and wise use of the environment while recognizing the following:
>
> (a) the protection of the environment is essential to the integrity of ecosystems and human health and to the well-being of society;
>
> (b) the need for Alberta's economic growth and prosperity in an environmentally responsible manner and the need to integrate environmental protection and economic decisions in the earliest stages of planning; …
>
> (d) the importance of preventing and mitigating the environmental impact of development and of government policies, programs and decisions;
>
> (e) the need for Government leadership in areas of environmental research, technology and protection standards; … [and]
>
> (i) the responsibility of polluters to pay for the costs of their actions…."

[82] To the extent that the Director, and this Board, must balance the often competing interests of economics and the environment pursuant to section 2 of EPEA, both the Director and the Board must have some evidence of and regard to the underlying economic rationale for, in this case, the Substitution Fuel Project. As the Approval Holder also argued, in undertaking his responsibilities in determining the BADT to control, in this case, particulate emissions and volatile heavy metals such as mercury and thallium, the Director must, through his evidence prove that he had regard for the economic factors associated with the relevant pollution control technologies. Indeed, the extract from *Alberta's Air Quality Management System*, filed in evidence in this hearing,[125] provides:

> "Alberta has a number of key policies which guide the management of industrial air toxics. These are as follows:
>
> - industrial facilities must be designed and operated in accordance with the pollution prevention principle;
> - emissions from each industrial source must be controlled using:
>
> (a) the best available control technology for carginogens; and

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[125] Exhibit No. 27, Air Toxics Management Program in Alberta, prepared by Air Emissions Branch and Air Issues and Management Branch, Alberta Environmental Protection, dated April 1998, at page 4.

(b) *best available demonstrated technology that is economically achievable for other air toxics*;

- residual emissions must be dispersed through a stack designed to keep ambient concentrations below regulated levels;
- cumulative impacts from multiple sources must be considered…." (Emphasis added.)

[83] In order to properly apply this policy, the Director needs to undertake, among other things, some investigations of the relative environmental and economic costs and benefits of various technologies, and consider, what others, and particularly the Approval Holder's competitors, in the cement industry are utilizing in terms of pollution control technology. Therefore, to the extent that the consideration of an applicant's economic and competitive market are reasons for bringing an application enables the Director, and this Board, to undertake the important functions of balancing the various competing interests identified in EPEA, particularly in section 2, and in other related policies, this information is both relevant and necessary. It is in this context that the Board wishes to make a number of comments on the evidence with regard to the need to convert to coal.

[84] The Board understands that the Inland Plant is the only remaining Canadian plant that still uses natural gas as its primary fuel.[126] The Board is also aware that the only other cement plant located in Alberta, the Lafarge Exshaw Plant, converted to coal earlier this year,[127] and that the Approval Holder's competitor in British Columbia, the Lafarge Richmond Plant, converted to coal in 1997.[128] The Approval Holder's sister company located in British Columbia, the Tilbury Plant, was also authorized to burn a combination of coal, natural gas, fuel oil, waste oil and tire derived fuel almost 17 years ago, in 1986.[129] As such, the Approval Holder represents the last in a series of coal conversions taking place over the past few years.

[85] During the hearing, the Board heard from the Approval Holder that fuel costs account for approximately 30 percent of operating costs,[130] and that as a result of dramatically

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126 Approval Holder's Submission, dated November 15, 2002, at page 10, paragraph 50.

127 Approval No. 1702-01-02, dated October 22, 2001.

128 Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page C-2.

129 Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at page C-2.

130 Transcript, dated December 17, 2002, at page 215, lines 25 and 26.

increased gas prices in the year 2000, and subsequent unsuccessful attempts by the Approval Holder to reduce costs by signing long-term contracts, the Approval Holder believes it must convert to coal in order to remain competitive.[131] The Approval Holder claimed that increased production costs put it at a large competitive disadvantage compared to its *American* competitors.[132] In support of this claim, the Approval Holder stated that currently, 13 to 14 percent of the cement sold in the Alberta market comes from coal-fired production in Montana.[133] The Approval Holder also asserted at the hearing that Canada is an exporter of cement, but that Alberta and the other Prairie Provinces are importers.[134] The Approval Holder also stated that most of the Canadian exports occur in Eastern Canada and in British Columbia.[135]

[86] In reviewing the Director's Record, the Board understands that the closest Canadian cement plant located east of the Approval Holder's Edmonton Plant is located in north-central Ontario, and the next easterly Canadian cement plant of comparable size to that of the Approval Holder's Edmonton Plant is located in southern Ontario.[136] The Board notes that Montana has two small cement plants, and none of the other prairie-border states or provinces have cement plants.[137] Indeed, it would appear that the two Alberta plants, the Lafarge Exshaw Plant and the Approval Holder's Edmonton Plant, may therefore have at least some geographical advantages in accessing the Canadian Prairie cement market.

[87] Notwithstanding the Approval Holder's concerns regarding the import from Montana of approximately 14 percent of the cement purchased in Alberta, the majority share of cement sold in this province by the Approval Holder's competitors is presumably more likely to come from its Canadian competitors - and more likely its western Canadian competitors, the Lafarge Exshaw and Lafarge Richmond operations. Indeed, it is these two competitor plants that

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131 Transcript, dated December 17, 2002, at page 215, lines 22 to 36, and page 316, lines 1 to 15. See also: Approval Holder's Submission, dated November 15, 2002 at paragraphs 49 to 51.

132 Transcript, dated December 17, 2002, at page 215, lines 26 to 29.

133 Transcript, dated December 17, 2002, at page 214, lines 24 to 31.

134 Transcript, dated December 17, 2002, at page 214, lines 31 to 33.

135 Transcript, dated December 17, 2002, at page 214, lines 33 to 35.

136 Director's Record, Tab 3, Economic Research: U.S. and Canadian Portland Cement Industry: Plant Information Summary, Data as of December 31, 2000, Map of Cement Plants.

137 Director's Record, Tab 3, Economic Research: U.S. and Canadian Portland Cement Industry: Plant Information Summary, Data as of December 31, 2000, Map of Cement Plants.

are cited by the Approval Holder in setting forth its project rationale (to remain competitive) in its August 2001 application to the Director.[138] In terms of a *competitor's* plant of comparable size, based on the production of clinker,[139] and proximity to a large urban population, the Board notes that the Lafarge Richmond Plant likely provides the closest comparable facility. The Lafarge Exshaw Plant would be a close second and is located in Alberta. In the Lafarge Exshaw Report and Recommendations, the discussion respecting the issue of BADT for particulates on a smaller kiln (still with an ESP) suggests that it may be appropriate to install a baghouse at the time of the next renewal of that approval. The Board especially notes the comment made in that Report and Recommendations that parties to that appeal accepted that "…the implementations of the baghouse controls on Kiln #5 main stack constitutes BADT for particulate emission control…."[140]

[88] The Board accepts that, in terms of a clean-burning coal, Alberta's coal is among the best. Again, the Board also believes that a properly operating cement kiln *can* be one of the cleanest methods of utilizing this kind of fuel. Further, the Board accepts that, with proper pollution abatement controls and proper mitigation measures, the use of coal as a fuel source for the Inland Plant is an acceptable choice, and that this can be an economic acceptable project. However, as part of the balancing associated with section 2 of EPEA, the Board believes that particularly where this kind of fuel is going to be utilized in an industrial facility located in close proximity to, and upwind of, a large urban population, the BADT must be utilized to reduce emissions of particulate matter. As the Board will address next, this is no doubt the case where

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138 Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), at pages C-1 and C-2.

139 Clinker is comprised of calcium oxide compounds that are produced as a result of pyroprocessing a mixture of limestone and shale or clay, by the addition of large quantities of heat in a cement kiln. This raw cement clinker is then usually mixed with gypsum and then ground into a powder, which is then mixed with sand, aggregates and water to form concrete. See: Director's Record, Tab 3, page 1, *CCME National Emission Guidelines for Cement Kilns*, the Director's Record.

140 *Kievit et al.* v. *Director, Approvals, Southern Region, Regional Services* re: *Lafarge Canada Inc.* (27 May 2002), Appeal Nos. 01-097, 098 and 101-R (A.E.A.B.) at page 16, paragraph 55:

> "The Board accepts that the implementation of the baghouse controls on Kiln #5 main stack constitutes BADT for particulate emission control on this important emission source. The Board acknowledges that upgrades to the electrostatic precipitator for Kiln #4 main stack were also required in the Approval. The Board concludes that further evaluation of what reasonably constitutes BADT for particulate emissions from the Kiln #4 main stack should be included in the provision of evidence for defining the BADT that the Board is recommending be provided to the Director prior to submission of the application for the renewal of their approval in 2007."

there has been a history of sub-optimal operations at an existing facility resulting in persistent incidents of increased emissions of particulate matter, causing public concern, nuisance conditions, and potential health impacts in the adjacent community.

D. ESP Performance and Trips

[89] The fact that the ESP has had a poor historical operating record with respect to dust control is undisputed. The poor operation of the ESP, among other things, has resulting in numerous "dusting" incidents. [141] Dust from the Plant was identified as a historic and ongoing problem for residents of the communities located to the southeast, particularly in Sherbrooke and Dovercourt where dust coats homes and automobiles, inside and out.[142] The historically poor operation of the ESP is one of the principal reasons that the Appellants cite for the need for a baghouse.

[90] Since it began work on the Substitution Fuel Project, the Approval Holder has also worked to reduce the number of ESP trips. The Director cites the work that the Approval Holder has done to reduce the number of trips as one of the principle reasons he is prepared to allow the continued use of the ESP as the pollution abatement technology for the Plant despite the switch to coal as a fuel source.

[91] As is discussed below, having reviewed this evidence, the Board is of the view that the "improved" performance of the ESP will not be adequate to deal with the valid health and nuisance concerns and does not provide a sufficient foundation for the Director's decision to allow the Approval Holder to maintain the ESP as the abatement technology for particulate matter from the Kiln Stack.

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141 Transcript, dated December 17, 2002, at page 332, lines 2 to 8. See also: Director's Record, Tab 3, Inland Cement Limited Substitution Fuel Project, Public Disclosure Document, dated November 14, 2000, Appendix III, Record of Dusting Incidents from Plant Upsets (1997-2000).

142 Transcript, dated December 17, 2002, at page 135, lines 30 and 21, and page 136, lines 1 to 24. See also: EFCL's Submission, dated November 15, 2002, Submissions of EFCL and Statements of Ms. Anna Krug, Ms. Bonnie Quinn, and Mr. Daryl Ranks.

1. Hearing Submissions

[92] EFONES expressed concern regarding the number of trips and whether Inland can limit the number of trips as specified by the Director. They argued the Director did not assess the consequence or necessity of these trips nor did he determine if *eight* trips is reasonable based on past performance.[143]

[93] The EFCL argued that the requirement to provide a plan to reduce the frequency of trips is not good enough as the ESP has a poor historical operating record, and even with a reduction in the number of trips, there will be significant "dusting" events.

[94] The Approval Holder stated that it worked hard to reduce the number of trips including: training of staff, revising its operating procedures, reviewing alarms and set points, and installing new instrumentation and gas analyzers. According to Inland, these procedures have reduced the number of trips from 64 in 2000 to 15 in 2001. It further submitted that the Approval contains strict limits on the number of trips, and if the limits are exceeded, it would be required to install a baghouse within 20 months.[144]

[95] On the issue of ESP trips, the Director's submitted:

> "A key issue related to the environmental performance of the Inland cement plant has been the frequency of ESP trips. An ESP trip occurs when the ESP is de-energized to minimize the potential for dangerous incidents caused by the presence of high levels of combustible gases or other unsafe operating conditions. During a trip, the particulate removal efficiency of the ESP declines substantially and significant levels of particulate matter are released in a very short period of time (approximately 2 minutes on average).
>
> During the environmental assessment process, Inland committed to developing a plan to significantly reduce the number of ESP trips. As a result, Inland provided its *ESP Action Plan* to Alberta Environment in March 2001. … With improvements in furtherance of the plan completed in 2001, Inland reduced the number of ESP trips from 64 in 2000 to 15 in 2001. … In its plan, Inland committed to replacing the ESP with an alternate system if significant reductions in the number of ESP trips were not achieved."[145]

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143 EFONES Submission, dated November 15, 2002, at paragraph 83.

144 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 35 to 38.

145 Director's Submission, dated November 15, 2002, at page 19, paragraphs 90 and 91.

[96] On this basis, the Director chose to allow the Approval Holder to continue to operate its existing ESP, provided the Approval Holder does not exceed a prescribed number of annual allowable trips. In the event the Approval Holder exceeds the authorized number of ESP trips, the Approval Holder must install a baghouse.[146]

2. Analysis

[97] During the hearing, it became clear to the Board that the evidence in the Director's Record pertaining to assessing the performance of the Approval Holder's ESP was incomplete in many ways, including that it did not provide an accurate account of the upsets occurring at the facility in which the ESP was not capturing particulates at its full efficiency. The Approval Holder's evidence of its ESP's performance as set out in its Application to the Director,[147] described *only* the incidents where the Approval Holder's ESP "tripped" (was de-energized) and the trip resulted in a reportable incident.[148] Importantly, the evidence presented to the Director in the Approval Holder's Application did not describe the actual number of reportable incidents (including those in which the ESP was not de-energized, but opacity[149] was greater than 20 percent for more than six minutes), nor did it describe the times when incidents arose where the opacity was greater than 20 percent (either from a trip, or during apparently normal operating conditions where the ESP was operating less optimally) for less than six minutes (an unreportable incident). This was a critical flaw.

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146 Director's Submission, dated November 15, 2002, at page 19, paragraphs 92 and 93.

147 Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), Appendix III, Table 3-28, at pages 3-24 and 3-25.

148 Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), Appendix III, Table 3-28, at pages 3-24 and 3-25. The Board notes that throughout the Approval Holder's Air Quality Report a "reportable incident" is described to occur "when the opacity of gases leaving the kiln stack exceeds 20% for longer than 6 minutes." A "reportable incident" according to the Approval is a situation where "the in-stack opacity exceeds 20% *averaged over a period of six consecutive minutes*…." (Emphasis added) See: Director's Record, Tab 1, Approval No. 10339-01-03, Approval Clause 4.1.29, at page 15. Under cross-examination by the EFCL, the Approval Holder admitted that Table 3.28 entitled "Record of ESP Performance" represents only the number of reportable incidents when the ESP was actually de-energized. See: Transcript, dated December 17, 2002, at page 310, lines 8 to 12.

149 "In-stack opacity" means the degree to which visible emissions obstruct the passage of light within a stack, flue, duct or stack breaching. Opacity is an indirect measure of the amount of particulates in the exhaust stream. See: Transcript, dated December 17, 2002, at page 302, lines 21 to 34.

[98] The importance of understanding the ESP's performance even where there is no actual ESP trip, was identified by the EFCL during cross-examination of the Approval Holder at the hearing as follows:

> "Mr. Fitch: Thank you. So the follow-up question is what is the magic of the ESP actually being de-energized? I mean, isn't the real point that there are cases even when the ESP doesn't de-energize, the plant is running normally, and you've got a lot of particulate emissions in that stack?
>
> Mr. Meagher: Sometimes we get situations where the ESP is not working at its efficiency, and that could be due to a problem with the moisture level. As I showed you this morning, the condition of the gases coming into the tower. We will go above the 20 percent for some period of time, and after 6 minutes we have to report that to Alberta Environment."[150]

[99] At the request of the EFCL, during cross-examination at the hearing, the Approval Holder undertook to provide the number of reportable incidents for 1999, 2000, 2001 and 2002.[151] These were provided during the hearing as: 81 in 1999; 85 in 2000; 33 in 2001; and 20 in 2002 (as of December 1).[152] These higher numbers included all of the reportable incidents, including cases where the opacity went above 20 percent for six minutes but there was no ESP trip.[153]

[100] The EFCL also provided summaries of the incident and monthly monitoring reports for the Approval Holder's plant.[154] These summaries showed a large number of upset conditions at the facility, including numerous unreported incidents (involving trips and non-trips) in which very high opacity readings were recorded at the Kiln Stack.[155] For example, in 1999,

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150 Transcript, dated December 17, 2002, at page 310, lines 21 to 34.

151 The Approval Holder's stack monitoring and reportable incident reports were not filed as part of the Director's Record in these appeals. The EFCL sought brought a preliminary motion before this Board by Letter dated Oct 9, 2002, seeking production of the Approval Holder's stack emission monitoring and reportable incident reports. As set out earlier in this report, by Letter dated November 5, 2002, the Board ordered production of these documents. The EFCL reviewed these extensive documents and provided a summary report to all parties prior to the hearing. During the hearing, the EFCL cross-examined the Approval Holder on this evidence. See: Transcript, dated December 17, 2002, at page 310, lines 13 to 20.

152 Transcript, dated December 17, 2002, at page 316, lines 14 to 19.

153 Transcript, dated December 17, 2002, at page 316, lines 22 to 28.

154 The EFCL brought a motion for production of the Approval Holder's Incident and Monitoring Reports, on October 9, 2002. The Approval Holder produced these documents on November 12, 2002, and the EFCL filed a summary of these reports with the Board on November 25, 2002 and a revised summary on December 16, 2002. As such, the documents properly form part of these proceedings.

155 Summary of Reportable Incidents Documentation produced by Inland, January 1999 – November 2002 (Revised Summary), attached to Letter from EFCL to Approval Holder, dated December 16, 2002.

there were a total of 114 incidents or upsets (for a total duration of 30.9 hours), where opacity of the effluent leaving the Kiln Stack was greater than 20 percent for periods ranging from six minutes to 76 minutes.[156] Of these 114 incidents, 75 where reported by the Approval Holder to Alberta Environment and 51 were reported to Alberta Environment as incidents where the ESP tripped. Only 44 of these incidents (for a total duration of 11.1 hours) were reported by the Approval Holder in its August 2001 Application to the Director.[157]

[101] In reviewing these incident reports it is apparent to the Board that there have been a large number of instances in which there is no ESP trip, yet there are very high opacity readings from the Kiln Stack. As set out above, in some years, these instances greatly outnumber the number of reportable incidents in which the ESP is actually tripped. In response to questions by the Board, the Approval Holder acknowledged the poor performance of its ESP and that this poor performance has, in large measure, contributed to the frustration of residents:

> "Mr. Schulz: Okay. If I may go back to the frequency of the upset and also the emissions during the upsets, the normal operations of the plant, when everything is running here the opacity runs in what range?
>
> Mr. Meagher: 4 to 5 percent, sometimes below that. Sometimes 1 or 2, but 4 to 5 is a pretty normal opacity range.
>
> Mr. Schulz: And if you have your ESP trip?
>
> Mr. Meagher: It will go right to 90, 100 percent. Originally, then you see the ESP comes back on again once they have made adjustments in the process to get rid of the high combustibles. It doesn't come down immediately. It slowly works its way down. And I don't think I have the right numbers, but if you have an ESP trip for a minute, perhaps the opacity doesn't get back to 20 percent for 5 or 6 minutes or somewhere in that magnitude.
>
> Mr. Schulz: And we heard some comment in evidence presented earlier this hearing that the number of upsets have been very high in the past, perhaps even in the hundreds?
>
> Mr. Meagher: In some years they could have been that high, yes. Yes, they have been over a hundred, yes.
>
> Mr. Schulz: Would you agree or comment on that the frustration experience reflected by the residents is in large measure due to ESP upsets and performance

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[156] Summary of Reportable Incidents Documentation produced by Inland, January 1999 – November 2002 (Revised Summary), attached to Letter from EFCL to Approval Holder, dated December 16, 2002, at page 6.

[157] Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), Appendix III, Table 3-28.

in the past?

Mr. Meagher: I think that is a fair statement, yes, that's why we made big improvements in the last two years." [158]

[102] In an effort to understand the improvements made by the Approval Holder in the last two years, the Board reviewed the incident and monitoring reports for this period. In particular, the Board focused on the reports for the period May 2002 through September 2002, to gain a better understanding of the improvements in ESP performance since the installation of the new gas analyzers. The Board notes that, beginning in May 2001, the Approval Holder's summary of opacity monitoring data (set out as "continuous opacity monitoring data for D stack") is set out using a new table. The new table divides the 24 hour day into six minute increments and inserts the six minute average opacity readings according to range. The Board notes that this provides a better understanding of the number of higher opacity incidents, even without ESP trips. In May 2002, for example, the Approval Holder had 81 six minute average opacity readings between 20 and 40 percent, and 28 six minute average opacity readings greater than 40 percent. Of these, 13 incidents were reported and 85 were dismissed as plant down (which, the Board agrees results in lesser emissions, but has concerns with dismissing them out-right), and 11 six minute average opacity readings that the Approval Holder did not consider reportable. The Board queries whether these 11 "incidents" should have been reported, as they indicate a dusting incident for the downwind receptors. Similarly, in June 2002, of 49 readings greater than 20 percent, 20 were reported, two dismissed, and 27 not reported. In July 2002, of 44 readings greater than 20 percent, 29 were reported, 18 were dismissed, and 11 not reported. For August 2002, of the 34 readings greater than 20 percent, 28 were reported, two were dismissed, and four not reported. In September 2002, of the 38 readings greater than 20 percent, two were reported, none dismissed, and 36 not reported. Overall, this still implies to the Board that even without ESP trips, there are dusting events from the Kiln Stack emissions that have the potential to impact the surrounding community.

[103] At the end of the day, the Board finds that while the Approval Holder may have reduced the number of reportable incidents resulting from ESP trips during the recent period of its Application review by Alberta Environment, the true picture of past, current, and potential

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[158] Transcript, dated December 17, 2002, at page 331, lines 12 to 34, and page 332, lines 1 to 8.

future ESP performance at this facility cannot be understood without consideration of, at minimum, all the reportable incidents (excepting those one or two related to spills) in which opacity is greater than 20 percent for more than six minutes. Obviously, there will also be a number of incidents, though of shorter duration and therefore not "reportable" (and also some of greater than six minutes, but not reported by Inland), that also result in periods of high particulate releases from the Approval Holder's ESP. These are also of concern to the Board.

[104] With regard to these shorter duration "unreported" periods of high opacity, the Board heard that the process problems associated with the build-up of plugs in the vessels in the conditioning tower at the Approval Holder's facility are a "fact of life" and that these can interfere with the flow of gases, which in turn can sometimes interfere with the combustion process and lead to ESP trips.[159] More often, however, these "fact of life" process problems lead to situations where the Kiln Stack opacity is greater than 20 percent, but for less than six minutes, and there is no ESP trip, but there are still larger emissions from the ESP/stack:

> "Mr. Schulz: Would some of these, when you look at the incident reports too, there are some incidents where they will. It [(the opacity)] is the greater is 20 percent but it is you know not for more than five minutes. I mean, ESPs didn't trip so you are not in any incident mode, but what would likely trigger these kind of emissions? You still have larger emissions from the ESP, from the stack?
>
> Mr. Meagher: What will normally happen in that situation, remember this morning I showed you the conditioning tower where the gases have to be conditioned. If there is a problem with the water pump or the air compressor which atomizes the water to put this spray into the tower, either the temperature can go up or the moisture can go down, and both of those move the gases on the resistivity curve to the point where the ESP cannot collect them efficiently and the efficiency goes down. So if something happens to get hot gases or if something happens to lower the moisture content, it can interrupt what is going on in the ESP. Occasionally, and this probably very rarely ever happens, if you should somehow get a sudden rush of gases through the system, the fan goes off haywire or whatever goes off control and then that can overpower the ESP but that is a fairly rare occurrence.
>
> Mr. Schulz: So when I read in the incident reports about the water level being adjusted that would be in the conditioning tower?
>
> Mr. Meagher: That is in the conditioning tower, correct."[160]

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159 Transcript, dated December 17, 2002, at page 327, lines 8 to 31.

160 Transcript, dated December 17, 2002, at page328, lines 6 to 35, and page 329, lines 1 and 2.

[105] It is clear also from the evidence in the Record, and that provided during the hearing, that the Director chose to focus on trip reduction – in his words, this was a key consideration – in order to allow the Approval Holder to continue to operate its existing ESP. The Board agrees there is no doubt that reducing the number of trips will result in reduced PM emissions. [161] It is clear to the Board from evidence at the hearing and in the Approval Holder's own reports that the percentage of fine particulates ($PM_{2.5}$) in its Kiln Stack effluent stream may be very high[162] and that collection of these fine particulates during trips, when the ESP is

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[161] See: Director's Record, Tab 3, Screening Report, Inland Cement Limited, Substitution Fuel Project, Alberta Environment, March 26, 2001, at page 18. The Director was clearly aware that these upset conditions that occurred with the ESP plate uncharged were contributing to the dusting incidents of concern to the area residents. In its Screening Report, Alberta Environment stated:

> "Inland indicated that the current output from the ESP device and main stack is 171 kg daily (or 52,326 kg annually based on a 306 day operating period) during normal operating conditions. The portion of this total particulate emission which is at or below 10 microns in size would be 39,168 kg per year. For the inhalable fraction, 2.5 microns or less in size the annual emission would be 20,808 kg.
>
> Inland indicates that the ESP trips have occurred approximately 4.3 hours (0.06% of operating time) in 1999 and that an estimated 55,000 kg of particulate matter was released during the year. In 2000 ESP trips occurred for 3.7 hours releasing an estimated 48,100 kg of particulate matter.
>
> Inland's estimated hourly rate of particulate emissions from the main stack during upset conditions is 13,000 kg per hour. The technical team noted that there are no measurements (stack surveys) of emission rates during an upset as it is extremely unlikely an upset would occur while a stack survey is being conducted. …
>
> The ESP is responsible for removing the majority of the remaining small particles in the flue gas stream. The efficiency of the ESP in doing this is said by Inland to be 99.9% with the ESP plates charged and 60% when they are not charged. However, the technical team noted that the capture efficiency of the ESP has not been verified directly through actual measurement.
>
> The technical team noted that in general the capture potential of the cyclones and ESP would be expected to be approximately as Inland described. However, very small particles at any stage would be captured with less efficiency than larger ones and could pass completely through the four stages of the cyclones. In addition, fine particles (e.g., the inhalable fraction 2.5 microns or less in size) would be captured at very low efficiency with the ESP plates uncharged.
>
> The team also noted that regardless of the cyclone and ESP passive capture rate, Inland's estimate of annual particulate emissions during upset conditions with the ESP plate uncharged (0.06% of operating time), are similar to or may be greater than the emissions under normal operating conditions, 99.94% of the operating time. This circumstance is of concern to Alberta Environment. The effect of dusting incidents is also of concern to area residents … [some views are documented in the Appendix of the Public Disclosure document]."

[162] See: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), Environmental Quality Management (May 2001) Report, in Appendix IX. Evidence was also provided to the Director in the Approval Holder's Application regarding the mean particle size of the major fraction of the mass entering the ESP: "Mean particle size of the recirculating dust is 1 to 2 um and is the major fraction of the mass entering the ESP." See also: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), "VDZ Report" Technical Report about the Stack Emissions at Edmonton Plant of Inland Cement Limited when Using Coal Instead of Natural Gas as Fuel", by Dr. Hoenig, dated May 25, 2001, Appendix XIII, at page 7. Here, the question of the concentration

"tripped" and acts like a "gravity filter", may be significantly less than 60 percent and perhaps as low as three and a half to six percent of the particles below 10 microns.[163] Given the emerging concerns regarding human health issues associated with $PM_{2.5}$ in urban settings, the efficiency of

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of total particulates comprised of fine particulates ($PM_{2.5}$) in the Approval Holder's Kiln Stack effluent stream was addressed, as follows: "Because of the low total particulate concentration in the exhaust gas of the Edmonton plant, the content of fine particles ($PM_{2.5}$) in the total particulate emissions will be relatively (sic) high. Investigations of particle emissions behind electrostatic precipitators show that $PM_{2.5}$ content is about 50 - 70percent."

[163] Under cross-examination EFCL, the Approval Holder agreed that a "gravity collector", such as a de-energized (tripped) ESP, would collect significantly less than 60 percent of the particulate matter below 10 microns in size. See: Transcript, dated December 17, 2002, page 304, lines 16 to 32 and page 305, lines 1 to 26:

> "Mr. Fitch: … And now I would like to pursue this issue of trips. Would Mr. Meagher or Dr. Volker [Honeig], would you agree that when the ESP is de-energized, that really at that point it's little more than what you might call a gravity collector?
>
> Mr. Meagher: We have stated very clearly that when it's de-energized it's about 60 percent efficient.
>
> Mr. Fitch: Right, okay. Isn't it true, though, that if you're dealing with fine particles like $PM_{2.5}$, really the dropout rate, if we can call it that, is much lower than 60 percent?
>
> Mr. Meagher: I'll turn that over to Dr. Hoenig.
>
> Dr. Hoenig: I think nobody measured it, but it can be expected that it is.
>
> Mr. Fitch: Are you able to estimate just how low it is?
>
> Dr Hoenig: No, we didn't.
>
> Mr. Fitch: Are you saying you tried and were unable to or you just didn't try?
>
> Dr. Hoenig: We didn't try because we have no measurement about that. But if I may comment on this, I would like to repeat that the measurements made here at Inland Cement show that the share of $PM_{2.5}$ is less than 5 percent of the total.
>
> Mr. Fitch: Well, we'll get to that. You have heard, sir, of the USEPA AP 42 document?
>
> Dr. Hoenig: I heard about it.
>
> Mr. Fitch: You don't know much about it, though?
>
> Dr. Hoenig: Not in detail.
>
> Mr. Fitch: I have what is obviously just simply an extract, but it seems to suggest that a gravity collector is only going to collect from 3.5 to 6 percent of particles below 10 microns in size. Does that sound about right?
>
> Dr. Hoeing: Yes, I think so.
>
> Mr. Fitch: So significantly less than 60 percent. Is that a yes?
>
> Dr. Hoenig: Yes.
>
> Mr. Fitch: You would agree that these are precisely the particles that are of concern with respect to human health?
>
> Dr. Hoenig: Can you repeat the question?
>
> Mr. Fitch: The finer particles are precisely the ones that are of concern to human health?
>
> Dr. Hoenig: Yes, I know."

See also: EFCL's Submission, dated November 15, 2002, Report of Mr. Alan Church, reference at page 14 to "USEPA, Emission Factor Documentation for AP-42, Section 11.6: Portland Cement Manufacturing." Available at http://www.epa.gov/ttn/chief/ap42/ch11/bg docs/b11s06.pdf (October 30, 2002). Exhibit No. 21, USEPA AP42. See also: Exhibit 24, Portland Cement Manufacturing. USEPA 1995.

the ESP in removing $PM_{2.5}$ during these trips is important; it is caught within the purposes of section 2(a) of EPEA.

[106] Further, as set out above, the Board heard in the course of the hearing there are also a large number of incidents and upsets at the Approval Holder's Plant during which the ESP is not operating at its efficiency, and that there are reportable incidents (though no ESP trip) and also numerous "unreportable" incidents or upsets where opacity is greater than 20 percent, but for less than six minutes. These upset conditions were explained by the Approval Holder at the hearing to be related, at least in part, to cement plant process conditions that are a "fact of life" and lead to problems with gas conditioning in the conditioning tower. These process issues precede the Approval Holder's ESP, but cause a change in the resistivity of particles such that the ESP is unable to properly remove them from the effluent stream. The Board heard that these upset conditions where the ESP has not been functioning optimally or where it has tripped have numbered in the 100's in past years, and the Approval Holder admitted that the local residents have valid concerns with respect to the dustings associated with these upsets. The Board understands that these upset conditions have also reduced in number during the recent period during which the Approval Holder's Application has been before the Director. However, the number of reportable incidents – roughly twenty for the current year – remain unacceptable.

[107] It follows, then, that the overall environmental performance of the Approval Holder's ESP in achieving particulate matter control on their Kiln Stack, cannot likely be improved to an acceptable degree by the reduction only of incidents in which the Approval Holder's ESP is tripped.[164] The particulate matter emissions resulting from the numerous upset situations at the plant where the Kiln Stack effluent opacity is greater than 20 percent is also of concern to this Board. As the Board discusses later in this report, when these upset conditions are taken together with evidence of the relative performance of the Approval Holder's 1979 ESP even on the basis of its own comparative evidence (that of German cement plants), PM removal efficiencies of new ESPs (5-15 mg/m3), and that of the Approval Holder's western Canadian

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[164] Director's Record, Tab 1, Approval No. 10339-01-03, at page 1, provides: "'ESP trip' means the de-energizing of the ESP caused by the presence of high levels of combustibles or other unsafe operating conditions during any kiln system operational period but does not include the de-energizing of the ESP caused by a global power outage resulting from an electrical power failure. Importantly also, ESP de-energizing during the kiln system pre-heating period, are not considered ESP trips, but rather an 'ESP outage during preheating'."

competitors (who have recently converted to coal and replaced at least one of their ESPs with a baghouse), a more accurate picture of the unacceptable performance of the Approval Holder's ESP may be drawn.

[108] The Board therefore concludes that the continued use of the ESP as the appropriate pollution abatement technology was not appropriate. Having regard to all of the evidence especially regarding the operation of the ESP, and as discussed further below regarding the BADT, the Board concludes that the more appropriate pollution abatement technology is a baghouse.

E. Best Available Demonstrated Technology

[109] A large portion of the arguments and evidence presented as part of the Hearing related to the application of BADT. The Approval Holder and the Director argued that the existing ESP, combined with a trip reduction program, constituted the appropriate choice of pollution abatement equipment for the Plant, notwithstanding the change in the fuel source to coal. The Appellants, motivated partly because of the poor past performance of the ESP, argued that, particularly given the switch to coal as a fuel source, the BADT for the Plant was a baghouse. The arguments presented with respect to the need for a baghouse are complex and the Board has considered these arguments in several ways. In the end, the Board concluded that the appropriate mitigation measures and the appropriate BADT for the Inland Plant is a baghouse.

1. Hearing Submissions

[110] All of the Appellants argued that the Approval Holder should be required to upgrade its pollution abatement equipment to incorporate BADT, including installing a new ESP or fabric filter system (commonly known as a baghouse). Mr. Hayes further stated that the Approval Holder should be required to continuously upgrade the facility as new technologies become available.

[111] The Appellants questioned why the Director would allow the Approval Holder to continue to use the ESP when alternatives are available and are being used in other facilities. EFONES further stated that the Alberta Ambient Air Quality Guidelines ("AAAQG") set

standards that ensure emissions are minimized through the use of BADT.[165] The AAAQG provides:

> "The guidelines are part of the Alberta air quality management system. This system was designed to ensure that emissions are minimized through the use of Best Available Demonstrated Technology (BADT), and that residual emissions are dispersed so that the guidelines are met….
>
> The Ambient Air Quality Guidelines are used in a number of ways….
>
> - Establishing approval conditions for regulated industrial facilities.
> - Evaluating proposals to construct facilities that will have air emissions….
> - Assessing compliance near major industrial air emission sources."[166]

[112] The EFCL submitted that the use of a baghouse would decrease particulate emissions by up to three to five times, and a baghouse is the BADT for particulate emission control at cement kilns. The EFCL did not think it was likely that the existing ESP would be capable of obtaining equivalent emission controls. In their submission, the EFCL stated that fabric filters "…usually collect more efficiently in the fine particle size range (<1.0um) than ESPs; especially in the 0.5um area."[167] The EFCL stated that baghouses are more reliable than ESPs because if there is a malfunction, usually it is only a few bags that are affected and the emission levels will not increase as dramatically as in an ESP trip. The EFCL stated that the use of coal as a fuel source will "…certainly alter the performance of the ESP, potentially for the worse (though this will likely be offset to some degree by the diversion of half the effluent stream to the coal mill)."[168]

[113] The EFCL submitted that it is "…clear that a fabric filter would produce the best performance that can be anticipated for the kiln system, either as a replacement or backup for the

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165 EFONES' Submission, dated November 15, 2002, at paragraph 78.

166 Table 1 - Alberta Ambient Air Quality Guidelines:

Suspended Particulates

24-hour average	100
Annual geometric mean	60

167 EFCL's Submission, dated November 15, 2002, Report of Mr. Alan Church, at page 5.

168 EFCL's Submission, dated November 15, 2002, at paragraph 31. In the December 16, 2002 Addendum Mr. Alan Church's Report entitled "Inland Cement Fuel Substitution Project (November 2002)," it notes that Approval Holder is now only proposing to divert approximately 15 percent of the flue gases. Therefore, the original gains in reduced particulate emissions predicted from the 50 percent diversion would be reduced accordingly.

existing ESP."[169] The EFCL also argued that the baghouse would provide better protection from heavy metal emissions than the ESP, particularly in the 0.5 μm size range. These Appellants also stated that an ESP system followed by a baghouse would make a highly efficient system.[170]

[114] The EFCL submitted that the capital cost of installing a baghouse is low, and that the annual operating and maintenance costs have historically been higher. However, the baghouse system is easily monitored and maintained.[171] According to the EFCL, the alternative system, the ESP, does not effectively collect particles in the 0.1 to 1.0 μm size, and if the ESP is forced to be turned off to reduce the amount of combustible gases as occurs during a trip, the particulates pass through the system relatively unhindered.[172]

[115] The Approval Holder submitted that the BADT for its Plant is the ESP as it requires less electrical energy and the operating costs are lower than a baghouse. It further argued that the service life and operational reliability of baghouses are limited and maintenance expenses are high.[173]

[116] In comparing the systems used in Europe, the Approval Holder stated that both ESPs and baghouses are used and are of the same efficiency, and in new kilns, fabric filters are increasingly being used, as economic conditions are now similar for the techniques.[174] It further stated that with fabric filters, there is no increase in emissions with operationally induced peaks in carbon monoxide concentration, which is directly related to ESP trips.[175]

[117] The Director stated "Alberta Environment requires that facility operators minimize emissions through use of best available demonstrated technology."[176] The Director

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169 EFCL's Submission, dated November 15, 2002, Report of Mr. Alan Church, at page 5.

170 EFCL's Submission, dated November 15, 2002, Report of Mr. Alan Church, at page 12.

171 EFCL's Submission, dated November 15, 2002, Report of Mr. Alan Church, at page 17.

172 EFCL's Submission, dated November 15, 2002, Report of Mr. Alan Church, at page 20.

173 See: Approval Holder's Submission, dated November 15, 2002, Tab 5, Technical Report – Substitution Fuel Project in the Edmonton Plant of Lehigh Inland Cement Limited, at pages 5 and 6.

174 See: Approval Holder's Submission, dated November 15, 2002, Tab 5, Technical Report – Substitution Fuel Project in the Edmonton Plant of Lehigh Inland Cement Limited, at page 5.

175 See: Approval Holder's Submission, dated November 15, 2002, Tab 5, Technical Report – Substitution Fuel Project in the Edmonton Plant of Lehigh Inland Cement Limited, at page 6. The concentration of carbon monoxide is used as an indicator of explosive conditions in the ESP. As a result, carbon monoxide is monitored and this is what "trips" the ESP.

176 Director's Submission, dated November 15, 2002, at paragraph 86.

submitted that "…both ESPs and baghouses can be used successfully to control particulate matter at cement plants with similar high collection efficiencies."[177]

[118] The Approval Holder argued that to determine the BADT, consideration must be given not only to a specific piece of equipment but also to the entire operation of a given facility, and consideration must be also be given to the economic cost of technology and to the individual circumstances of a given facility.[178] The Approval Holder argued that its ESP is the BADT for the purposes of its Edmonton facility.[179] It cites lower electrical consumption (and therefore lower CO_2 emissions from electrical generation) and lower operating costs for the ESP as the considerations that the ESP is the BADT for its facility.

[119] The Director argues that Alberta Environment requires that facility operators minimize emissions through the use of BADT. As a result of this, argues the Director, the issue of whether the ESP is the most effective particulate control device for the Approval Holder's Edmonton plant was carefully considered by the Director during the application review process.[180] According to the Director:

> "The evaluation conducted by the Director showed that both ESPs and baghouses can be used successfully to control particulate matter at cement plants with similar high efficiencies.
>
> The particulate control performance of Inland's ESP system has been satisfactory during normal operations. However, upset conditions or 'trips' which result in a significant decline in the particulate removal efficiency of the ESP, have been a concern to Alberta Environment and this was identified as an issue in statements of concern submitted during the application review process.
>
> The Approval balances the considerations noted in [the above] paragraphs … by focusing on improvement in the performance of the existing ESP through reduction in the number of trips. The Director made an appropriate decision on this issue."[181]

[120] At the hearing, the question posed to the Director during his direct evidence implied that the review conducted by the Director was to determine "…whether the ESP was an appropriate particulate control device…", and notably *not* whether it was the BADT:

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177 Director's Submission, dated November 15, 2002, at paragraph 87.

178 Approval Holder's Submission, dated November 15, 2002, at page 6, paragraph 30.

179 Approval Holder's Submission, dated November 15, 2002, at page 6, paragraph 31.

180 Director's Submission, dated November 15, 2002, at page 18, paragraph 86.

"Mr. McDonald: Can you describe the review that was done whether the ESP was an appropriate particulate control device.

Mr. Singh: During the review process, it was necessary for us to evaluate whether the ESP was an appropriate particulate control device for the Lehigh Inland facility. In order to complete this evaluation, I instructed our staff to assess the suitability of the ESP by conducting an independent background review. ….

Mr. McDonald: What were the key findings from the evaluation and review that you and your staff performed?

Mr. Singh: Firstly, it was concluded that electrostatic precipitators and baghouses are the two predominant forms of particulate control equipment used for the kiln stack at cement plants. Secondly, during normal operations, both ESPs and baghouses are capable of achieving licensed particulate limits. Thirdly, ESP trips do occur at other cement plants but it is our understanding that it is technically feasible to operate ESPs with very few trips. However, based on our review, we noted that the operating approvals or permits for cement plants do not appear to specify limits for ESP trips. The key differences between these two technologies are that baghouses are typically not affected by upset conditions as cement kilns may experience periodically to the same extent that ESPs are affected.

Mr. McDonald: What did you conclude from these findings?

Mr. Singh: As a result of these findings, we were able to confirm that ESPs and baghouses are both acceptable particulate control technologies for cement plants; however, ESP trips are an important aspect of the environmental performance of the Lehigh Inland Cement Edmonton plant. ESP trips are an issue we focused upon in our review and during the drafting of the amending approval. … We believe that the specified [trip] limits are stringent but achievable. If the plant cannot meet these limits we believe that it is appropriate to require the replacement of the ESP with a baghouse. We do not normally specify the exact type of control technology that is to be used in a plant, but in this case, we are prepared to do so if the new requirements cannot be met." [182]

[121] Importantly, the Board notes that nowhere in the evidence has the Director specifically stated his determination of what BADT is for minimizing emissions of particulates from the Kiln Stack. The Board in its consideration recognizes that the BADT reflects a technology, that is "electrostatic precipitation" or "baghouse dust collection – fabric filtration." In that sense, electrostatic precipitation may be the BADT, however the operation or capability of a specific ESP may not meet or be capable of meeting the BADT. Some of the wording used

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181 Director's Submission, dated November 15, 2002, at page 18 and 19, paragraphs 87, 88, and 89.

182 Transcript, dated December 18, 2002, at pages 425, lines 11 to 35, page 426, and page 427, lines 1 to 11.

by the Director in his evidence and in referring to BADT application include: "most *appropriate* particulate control device" and "most *effective* particulate control device ". Both of these terms are utilized in the *Industrial Release Limits Policy* and will be discussed further in the section on use of the BADT. Under cross-examination by the EFCL, the Director reiterated his position that his review was with regard to the most appropriate emissions control equipment, and not one focused on the BADT:[183]

> "Mr. Fitch: … Mr. Singh, could you confirm that Alberta Environment was aware from the outset that the issue of the best available demonstrated technology for particulate matter control was of great concern to residents?
>
> Mr. Singh: I wouldn't phrase it that way. I would phrase that the ESP trips were of concern to residents. That's what we noted right from the beginning.
>
> Mr. Fitch: But in due course, you did an incident review, basically, did you not, of best available technology for particulate matter control from cement kilns?
>
> Mr. Singh: Our review was with regards to the most appropriate emissions control equipment, specifically ESP versus baghouse. That would have an element of best available demonstrated technology. But our focus was what is the most appropriate, ESP or baghouse, for this site."

[122] The Board notes that the Director also did not specifically answer his own question, as set out in his written submissions and repeated during the hearing,[184] whether the ESP is the *most* effective particulate control device for the Approval Holder's Edmonton plant. Although, as the Board discusses later in this Report and Recommendations, the evidence contained in the Director's Record appears to more easily support a finding that baghouses are the most effective. Instead, the Director states his finding that both ESPs and baghouses *can* be used successfully at cement plants to control particulate matter with *similar* high efficiencies.

[123] The key word here is "similar" and how the Director interprets it. Here was considerable evidence that while average particulate removal performance may be similar, the baghouse can achieve better removal efficiency and can do so more consistently. The important and outstanding question that appears to be left unanswered is whether the existing ESP is capable of the BADT, with the Director choosing instead to focus on the potential for improvement in its performance through a reduction in the number of trips.

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183 Transcript, dated December 18, 2002, at page 484, lines 34 and 35 and page 485, lines 1 to 16.

184 Transcript, dated December 18, 2002, at page 485, lines 15 and 16.

[124] Importantly, based on the information available to him, the Director found the performance of the Approval Holder's ESP to be "satisfactory" or "acceptable" during normal operations, but "of concern" during upsets or "trips". This judgment of acceptable performance was in relation to emission limits set by the CCME Guideline, a comparison that is problematic for consideration of BADT. This is elaborated in the next section on policy analysis.

[125] Presumably then, even with a reduction in trips, the Approval Holder's ESP performance during normal operations will still be only satisfactory or acceptable. In response to questions posed by the Board, the Director provided further insight on the issue of the acceptability or adequacy of the Approval Holder's ESP, and how this informed his approach to determining the appropriate pollution technology for the facility.[185] The Board asked the Director about his approach to gaining relevant economic information to make his determination of BADT, that is a baghouse or an ESP:[186]

> "Mr. Singh: As I say, we were able to obtain the information through other sources. One key element of this application is that with the fuel change it did not require the replacement of an ESP or a control system. My understanding, if that was required, then I could see the process that has been discussed [(determination of BADT)]. But with the existing equipments *adequately sized*, the application is not to change out a piece of equipment, it is to modify the process. And so in this case, the factor was that an ESP does exist at the site, it is *adequately sized* for the changes that have been proposed, so it is an existing piece of equipment. *So a fundamental part of this application was use of existing equipment that was adequately sized*." (Emphasis added.)

[126] Based on the Director's finding that both ESPs and baghouses *can* be used successfully at cement plants to control particulate matter with *similar* high efficiencies, and that a trip reduction program would address at least some of the high particulate releases at the facility, he allowed the Approval Holder to continue operating its existing ESP. He did so, however, mandating the installation of a baghouse as the back-up requirement, in the event the number of trips allowable under the Approval were exceeded. As one of the Appellants pointed out during the hearing, perhaps the best evidence of the Director's actual decision on appropriate

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185 Transcript, dated December 18, 2002, at page 528, lines 5 to 19.

186 Transcript, dated December 18, 2002, at page 528, lines 5 to 19.

BADT is evidenced by his own decision to require the installation of a baghouse in the event the Approval Holder exceeds the allowable number of trips.[187]

2. Policy Analysis

[127] The Director referred the Board to the Alberta Environment policy entitled "Industrial Release Limits Policy ("IRLP"), dated November 2000, that governs the issuing of approvals.[188] Consistent with section 2(a) of EPEA, this policy states that:

> "Industrial release limits are intended:
>
> - to *protect the ambient environment and human health*
> - to ensure the *most appropriate* pollution prevention and control technologies are adopted, and
> - to seek continuous improvement." (Emphasis added.)[189]

The approach to setting industrial release limits in based on the following principles:

> "Principle 1: Industrial release limits will be established based *on limits achievable using the most effective demonstrated pollution prevention / control technologies or the limits required to meet risk based and scientifically defensible ambient environmental quality guidelines, whichever are the more stringent* (Note: advanced technology limits may be adopted in lieu of ambient limits in certain circumstances).
>
> Principle 2: When developing a technology based release limit AENV will consider any relevant sector-specific technology based limits from other jurisdictions. A sector-specific limit relies on the use of the most effective demonstrated pollution prevention / control technologies. This type of limit is applied uniformly across an industrial sector. *In general, AENV sector-specific technology based limits will be among the most stringent when compared with other jurisdictions*." (Emphasis added.)[190]

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187 Transcript, dated December 18, 2002, at page 554, lines 35 and 26 and page 555, lines 1 to 9.

188 Director's Submission, dated November 15, 2002, at paragraph 17 referring to Tab 2, Industrial Release Limits Policy, November 2000.

189 Director's Submission, dated November 15, 2002, at paragraph 17 referring to Tab 2, Industrial Release Limits Policy, November 2000, at page 1.

190 Director's Submission, dated November 15, 2002, at paragraph 17 referring to Tab 2, Industrial Release Limits Policy, November 2000, at page 2.

[128] The evidence of the Director's panel was that the particulate emission limit of 0.07 kg particulate per kg of effluent (which was estimated by the Director's staff to correspond to be approximately 90 mg/m^3 of effluent) adopted for the Kiln Stack in the existing approval and retained in the Approval was based on the Canadian Council of Ministers of the Environment ("CCME") National Emission Guideline for Cement Kilns (March 1998) (the "CCME Guideline").[191]

[129] The CCME Guideline makes no reference to being based upon BADT nor any level of best technology for particulate removal.[192] In fact, the CCME Guideline states: "While this Guideline establishes maximum broad national emission limits, it is acknowledged that federal, provincial or regional environmental authorities may impose more stringent limits in response to regional or local problems."

[130] The Director acknowledged that the license limit for the Lafarge Richmond Kiln Stack was 35 mg/m^3. Further he acknowledged that although the Lafarge Richmond Plant is a rebuilt plant, he had apparently not inquired about the reasons for the more stringent emission limit at this plant compared with the Lafarge Tilbury Plant that had a limit of 125 mg/m^3 because he could only speculate on what the reasons for this difference may have been.[193]

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191 See Transcript, dated December 18, 2002, at page 499, lines 14 to 24:

"Mr. Fitch: If you look at the amending approval the limit is .070 kg per effluent?

Ms. Sartori: That's correct

Mr. Fitch: Could you agree with me that that roughly is equivalent, using different unit of measurement, to 90 milligram per cubic meter?

Ms. Sartori: That's correct

Mr. Fitch: Now you have testified that this limit in Inland's license is basically in accordance with the CCME guideline?

Ms. Sartori:That's correct."

192 Director's Record, Tab 3, CCME *National Emission Guideline for Cement Kilns* (March 1998).

193 See: Transcript, dated December 18, 2002, at page 491, lines 28 to 35 and page 492, lines 1 to 26:

"Mr. Fitch: Could you confirm for me that this figure of 35 milligrams per cubic meter is the regulatory limit for the two plants in B.C.

Mr. Singh: Yes, that's an important point. It is only for Lafarge Richmond. I believe at Tilbury it's 125.

Mr. Fitch: And why is the limit so low for the Lafarge plant in Richmond?

Mr. Singh: Because it's a completely rebuilt plant. It's, in essence, a new plant that has been built on the site of where there is a previous plant. It's a brand new plant.

Mr. Fitch: Did the proximity to a large population center have anything to do with it?

[131] Comparing how particulate emissions were dealt with in comparison to NO_x, the Director's panel testified that there was no limit specified for NO_x in the original approval, but a limit was added to the Approval that was more stringent than the limit suggested by the CCME Guideline in order to ensure that the AAAQG for NO_2 are not exceeded.[194]

[132] The submission of Dr. Brown,[195] on behalf of the Approval Holder showed that the emission scenarios used in the risk assessment indicated that maximum NO_x emissions from

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> Mr. Singh: The detail I don't know. Tilbury and Lafarge are actually very close. One is on one side of the river, the other is on another side. So that detail I don't know in terms of why that number was selected for Lafarge.
>
> Mr. Fitch: So, I'm trying to understand your answer. You're saying that the Richmond plant has a regulatory limit for PM emissions of 35 milligrams per cubic meter because it's brand new. Is that right?
>
> Mr. Singh: No. I'm indicating that Lafarge Richmond is a new plant. I don't know the exact factors that were considered in terms of a 35 milligram per meter cubed.
>
> Mr. Fitch: Do you know any of the factors?
>
> Mr. Singh: There are a number that come to mind. It could be –
>
> Mr. Fitch: Well, what I am wondering is do you know them or are you speculating?
>
> Mr. Singh: Sorry, I would be speculating and that wouldn't be appropriate."

The Board is perplexed with the Director's responses to these questions. It is evident that he was interested in the reasons why limits were set differently for the two facilities and why a baghouse was required at the Lafarge Richmond Plant. The Board notes the Director had prepared questions to ask when touring the facilities, and two questions are pertinent to this issue:

> "14. Please describe the process that led to the decision that Lafarge install a baghouse rather than an ESP. What were the key drivers? …
>
> 25. Please describe a decision-making process that led to the decision that Lafarge install a baghouse rather than an ESP. What were the key drivers?"

See: Director's Record, Tab 3, Alberta Environment Tour with GVRD, November 23 – 24, 2001, Tillbery Cement and Lafarge.

The Board also notes the experience of the individuals that took part in the tour and the fact their responsibilities include writing approvals with appropriate conditions. It is their job to find out this type of information, and it is the Board's understanding that this was one of the reasons the Director actually toured these facilities and met with their counterparts in British Columbia. The Board is surprised the Director was unable to answer these questions.

[194] Transcript, dated December 18, 2002, at page 418, lines 14 to 30:

> "Mr. McDonald: Could you please now describe the air emission limits that are included within this approval?
>
> Ms. Sartori: The majority of the emission limits in amending approval are based on information and guidance provided in the Canadian Council of Ministers of the Environment, CCME, national emissions guidelines for cement kilns. For oxides of nitrogen, Clause 4.1.25, specifies a new combined NO_x emission limit of 7.4 tonnes a day based on a monthly average. This is for both the existing kiln stack and the new coal mill stack.
>
> It should be noted that the previous approval did not stipulate a NO_x emission limit. To ensure that the Alberta Ambient Air Quality Guidelines for NO2 are not exceeded, the limit specified in the approval is more stringent than the limit suggested by CCME."

[195] See: Approval Holder's Submission, dated November 22, 2002, Rebuttal Affidavit of Gordon Brown,

the Inland Plant comprised about 10 to 12 percent of the one hour, 4 to 8 percent of the 24-hour and 10 to 18 percent of the annual AAAQG for NO2 that were used as the reference concentration in calculating concentration ratios at the maximum off-site location. In each case for these ranges, the higher value corresponds to the case of using 15 percent Fording coal versus emissions from the existing natural gas fuel scenario. When total emission sources of NO_x were considered in the Approval Holder's risk assessment, the fraction of the AAAQG for NO2 that was predicted ranged from 90 to 91 percent for one hour, 90 to 94 percent for 24-hour and 87 to 94 percent for annual average.

[133] Referring to particulate emissions, Alberta has an AAAQG only for total suspended particulate (TSP) which is 100 ug/m^3 for a 24 hour average. Alberta does not have an ambient air quality guideline for either PM_{10} or $PM_{2.5}$. However, Dr. Brown's submission refers to a Canada Wide Standard for $PM_{2.5}$,[196] a standard that is developed under the auspices of CCME and to what were referred to as Health Canada (1999) draft standards for $PM_{2.5}$ and PM_{10}. The latter were: "The National Ambient Air Quality Objectives (NAAQOs) (draft) recommended by Health Canada and Environment Canada under the auspices of the Canadian Council of Ministers of the Environment". [197]

[134] In the absence of a specific, official Alberta air quality guideline for $PM_{2.5}$, comparison with the Canada-wide standard for $PM_{2.5}$ shows that the Inland's maximum offsite concentration 24-hour $PM_{2.5}$ exceeds the numerical level of the Canada-wide standard of 30 ug/m^3 without addition of other (background) sources for both the natural gas (31.5 ug/m3) and 15 percent Fording coal (37.5 ug/m3) cases.[198] Including background contributions, the predicted maximum values range from 40 to 44.5 ug/m^3 for natural gas and 46 to 50.5 ug/m^3 for 15 percent Fording coal. These maximum values are based on maximum predictions over a five year period

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Exhibit A, at Table 3-1 for maximum one hour and maximum 24-hour NOx, Table 3-4 for maximum annual NO_x ratios to the corresponding Alberta Ambient Air Quality Guideline.

196 Report of an Expert Panel to Review the Soci-Economic Models and Related Components Supporting the Development of Canada Wide Standards for Particulate Matter and Ozone to the Royal Society of Canada, June 2001, page V: "For $PM_{2.5}$ the CWS [(Canada Wide Standard)] to be achieved by 2010 is 30 micrograms per cubic metre, 24 hour averaging time, based on the 98th percentile annual value averaged over three consecutive years."

197 See: Approval Holder's Submission, dated November 22, 2002, Rebuttal Affidavit of Gordon Brown, Exhibit A, at page 8.

198 See: Approval Holder's Submission, dated November 22, 2002, Rebuttal Affidavit of Gordon Brown, Exhibit A, at page 30, Table 3.8.

so that 98 percent compliance that is expected with the Canada-wide standard might be achieved, but the analysis in the Cantox Reports did not deal explicitly with that 98 percent level of compliance. Rather, the Cantox Reports stated that in relation to these five year maximum values: "The predicted concentrations would be less than half the predicted maximum concentration over 95 percent of the time."[199] The foregoing analysis in the Cantox Reports is also done for the location of maximum ground level concentration, whereas maximum ambient $PM_{2.5}$ levels at the seven residences (considered in the risk assessment) that are contributed by the emissions from Inland using the 15 percent Fording coal case would range from nine percent (residence three) up to 37 percent (residence five) of the Canada-wide $PM_{2.5}$ standard.

[135] The issue of meeting the 24-hour Canada-wide standard for $PM_{2.5}$ was addressed by a report entitled "Inland Cement Ltd. Substitution Fuel Project Air Quality Assessment Methods"[200] that was submitted in response to the second supplemental information request from the Director. Table 4-11 of this report lists airborne particulate predictions at all seven community receptor sites for total suspended particulate (TSP), PM_{10} and $PM_{2.5}$.[201] This summary shows that the $PM_{2.5}$ values (including a background contribution of 13 ug/m3) at the 98 percent frequency extreme, range from 49 to 61 percent of the Canada-wide standard. Table 4-12 of this report shows $PM_{2.5}$ values (including a background contribution of 13 ug/m3) at the 98 percent frequency extreme for upset days shows a range from 85 percent to 194 percent of the Canada-wide standard, with five out of seven community receptor locations exceeding the 30 ug/m^3 value.

[136] The AAAQG values do not specify a percentage compliance level so that even a maximum value would qualify as exceeding an AAAQG. Table 4-12 of this report shows that the 24-hr AAAQG for total suspended particulates would be exceeded at the 98 percent frequency extreme at two of the community receptor locations and the maximum predicted value would be exceeded at four of the seven community receptor locations, with those locations not exceeding the AAAQG ranging from 84 to 96 percent of the AAAQG. In all of these estimates, a

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199 See: Approval Holder's Submission, dated November 22, 2002, Rebuttal Affidavit of Gordon Brown, Exhibit A, at page 30.

200 Director's Record, Tab 2, Inland Cement Ltd. Substitution Fuel Project Air Quality Assessment Methods.

201 Director's Record, Tab 2, Inland Cement Ltd. Substitution Fuel Project Air Quality Assessment Methods, at page 78.

background contribution from other non-Inland sources was assumed at 46.9 ug/m3, meaning that 47 percent of the AAAQG was contributed from non-Inland sources of particulate.

[137] Because there is neither an AAAQG nor a Canada-wide standard for PM_{10}, the only available Canadian comparison is the value that the Cantox Reports refers to as the Health Canada (1999) draft. This value, which was set by the Working Group on Air Quality Objectives and Guidelines was directed by the Federal-Provincial Advisory Committee to develop National Ambient Air Quality Objectives.[202] The value in question was derived in Part 1 of the process, to provide a Science Assessment Document and Derivation of the Reference Levels, which are described as: "The Reference Level is a level above which an effect on a receptor (human or environmental) has been demonstrated."[203] The Air Quality Objective ("AQO") process notes that: "The AQO may be selected at the Reference Level, or it may be either lower or higher, depending on background levels of the pollutant, uncertainties in the underlying scientific data, and other considerations as listed above."[204] This document recommended a Reference Level for 24-hour average PM_{10} of 25 ug/m3. According to the data provided in Table 4-11, this federal-provincial reference level for 24-hour average PM_{10} would be exceeded at all community receptor locations, inevitably because a background concentration of 25 ug/m^3 was assumed for these cumulative values. According to Table 4-12, this reference concentration for PM_{10} would be exceeded by 36 to 119 percent at the 90^{th} percentile frequency on days with upset events and would be exceeded by from 123 percent to 583 percent for the maximum 24-hour PM_{10} levels at the community receptors. Although this reference concentration for PM_{10} may have less status than the AAAQG for TSP or the Canada-wide standard for $PM_{2.5}$, it was the product of a major federal-provincial air quality assessment effort.

[138] In the case of NOx, the Director, to his credit, applied standards for NO_x that were more stringent than the CCME Guideline on the basis that more stringent emission controls were necessary to preclude exceeding the AAAQG for NO2. The submission of the Approval Holder indicates that their maximum emissions contributions comprise from 8 to 18percent of the

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202 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, Exhibit B.

203 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, Exhibit B, Executive Summary.

204 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, Exhibit B. The other consideration include monitoring technology, economic benefits and public stakeholder consultations.

AAAQG value that is predicted to be approached closely, but not exceeded in the maximum emissions scenarios.

[139] By contrast, in the case of particulates, the Director did not consider the predictions provided by the Approval Holder that 24-hr total suspended particulates concentrations would exceed the AAAQG (albeit with a 47 percent contribution from background sources) as grounds for requiring more stringent particulate emission controls than were specified by the CCME Guideline. The Board notes that the CCME Guideline does not claims to be a BADT guideline, rather the CCME Guideline describes itself as being "… maximum broad national emission limits, it is acknowledged that federal, provincial or regional environmental authorities may impose more stringent limits in response to regional or local problems."[205]

[140] Likewise, the Director apparently did not consider the Canada-wide standard for $PM_{2.5}$, also developed under the auspices of CCME, to warrant consideration in determining emission limits for particulates in the same manner that AAAQG were considered in determining NO_x emission limits. The evidence from the Approval Holder's submission is that the maximum ambient concentrations arising from Inland emissions of $PM_{2.5}$ exceed the Canada-wide standard alone, without any consideration of other PM sources. It is not clear to the Board why the Canada-wide standards should have any less status or importance for the Director than the CCME Guideline.

[141] Finally, the evidence provided by Inland is that the community receptor locations are already exposed to 24-hour average PM_{10} concentrations above the reference level concentration for PM_{10} recommended by a Federal/Provincial advisory committee as representing the scientific basis for developing an ambient air quality objective. In this case, any additional contribution from Inland will contribute directly to exceeding the reference level.

[142] The Board concludes that the Alberta Environment policy requires the Director to consider BADT. In this case, it is apparent that he did not and as a result, his decision was flawed.

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[205] Director's Record, Tab 3, CCME National Emission Guideline for Cement Kilns (March 1998), at page 1.

3. Conclusions Regarding BADT

[143] During the hearing, it became evident to the Board that an accurate assessment of the performance of the Approval Holder's ESP could not be accomplished by the consideration only of the number of reportable incidents in which the ESP was "tripped" and the trip resulted in a "reportable incident" as set out in the Approval Holder's Application. The Director's decision, therefore, to allow the continued use of the ESP and to delay installation of fabric-filter baghouse control technology, based (1) on the Approval Holder's evidence of ESP performance largely/primarily as it relates to reportable incidents in which the ESP is tripped, and (2) on the Approval Holder's commitment to reduce the number of ESP trips, is therefore both inadequate and too slow in dealing with the overall poor performance of the Approval Holder's particulate control device, and the residents' concerns stemming from that poor performance.

[144] Adding to these findings, the emerging human health concerns related to particulate matter levels, and specifically $PM_{2.5}$, in urban settings, the question of the relative capabilities of ESPs versus a baghouse in reducing emissions of these pollutants is obviously a question of some importance. Indeed, the Director submitted to this Board that "Alberta Environment requires that facility operators minimize emissions through use of best available demonstrated technology."[206] The Board agrees with the Director that Alberta Environment requires facility operators to minimize emissions through the use of BADT. As the Board noted before, the regulatory precedent of Alberta Environment has been to require the implementation of BADT for issuing approvals, even in cases where the ambient air guidelines are not being exceeded.[207] Both the Board and the Minister of Environment have, in the past, upheld a specific challenge by an approval holder to this policy.[208] Significantly, these decisions to require BADT have been made as part of a continuous improvement approach in situations involving "brownfields", and not only in the case of "greenfields".[209]

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206 Director's Submission, dated November 15, 2002, at page 18, paragraph 86.

207 *Kievit et al.* v. *Director, Approvals, Southern Region, Regional Services* re*: Lafarge Canada Inc.* (27 May 2002), Appeal Nos. 01-097, 098 and 101-R, (A.E.A.B.) at page 16, paragraph 42.

208 *Ainsworth Lumber Co. Ltd.* v. *Director, Northwest Boreal Region, Alberta Environment* (26 June 2000), Appeal Nos. 00-004 and 00-005 (A.E.A.B.).

209 The terms "brownfield" and "greenfield" are used to describe different types of developments. A "greenfield" development is brand new that occurs on land that has not previously been disturbed for industrial development. A 'brownfield" development, or perhaps more correctly a redevelopment, occurs on land that has

[145] The Director had clear evidence before him from his internal review, that the installation of a baghouse at the Approval Holder's facility would address both the concerns of local residents about particulates from the facility, and allow Inland more options if lower fine particulate emissions and/or mercury control are required in the future. One such opinion comes from the Alberta Research Council:

> "The following are my comments on reviewing the Inland Cement Application and the Statements of Concern. …
>
> 4. Particulate emissions is the main concern expressed in the statements of concern. Also fine particulate emissions (less than 10 microns) and the reduction of emissions of fine particulate is receiving allot (sic) of attention worldwide. The switch to coal will have little or no impact on particulate emissions as the majority of the particulates originate from the raw feed material. As described by Inland, the system for preheating the coal feed will remove some of the particulate emissions from that of the current system. The main issue on particulates is the existing electrostatic precipitator (ESP) and safety trips of the ESP which will result in short periods of very high particulate emissions. Essentially *all new coal-fired power plants worldwide are installing baghouses rather than ESP's due to better capture of fine particulate* (less than 10 micron), inherent increase of SO2 capture in the ash material coating the bags and potential for operating with activated carbon injection for mercury control. I think these are three very good reasons for Inland to consider replacing the existing ESP and it would address several of the concerns of people in the area on emissions and allow Inland more options if lower fine particulate emissions and/or mercury control are required in the future."[210] (Emphasis added.)

The Board notes, that at the time Mr. Chambers reviewed the Application, the Approval Holder was proposing to divert 50 percent of the kiln flue gases back to the coal dryer. The Approval Holder since decided only to divert only approximately 15 percent of these gases. Obviously, any advantages attached to this diversion, in terms of reduced particulates entering the gas stream to be treated by the ESP, will be reduced accordingly.

[146] The Director's staff prepared a report setting forth its findings on the Approval Holder's ESP trips, and the background work conducted by Alberta Environment regarding the

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previously been disturbed for industrial development. See: U.S.E.P.A., Term of Environment: "Brownfield: Abandoned, idled, or under used industrial and commercial facilities/sites where expansion or redevelopment is complicated by real or perceived environmental contamination. They can be in urban, suburban, or rural areas."

[210] Director's Record, Tab 3, Email correspondence from Mr. Alan Chambers, Alberta Research Council, to Ms. Anita Sartori, dated December 3, 2001, regarding supplemental questions to Inland.

use of an ESP versus a baghouses in cement plants.[211] In the report, Alberta Environment provides the following useful tables setting forth the advantages and disadvantages of ESPs and baghouses:[212]

Table 1: Advantages and Disadvantages of ESPs

ESP	
Advantages	Disadvantages
• High collection efficiency of coarse and fine PM if sized adequately. • Low operating cost. • Low maintenance cost. • Low pressure drop. • Operation at high temperatures.	• ESP trips result in great amounts of PM emissions. • Explosion hazard when combustible gases or combustible PM is present. • Requires advanced control techniques to avoid trips. • Large size unit required for collection of fine PM. • ESP generally not active during start-up • High capital costs especially when high efficiencies are desired. • Requires sophisticated maintenance and operating personnel. • ESP's (*sic*) are generally not suitable for highly variable processes. ESP efficiency is very sensitive to changes in coal, ash and flue gas composition.

Table 2: Advantages and Disadvantages of Baghouses

Baghouse	
Advantages	Disadvantages
• High collection efficiency for coarse and fine PM • Not highly sensitive to fuel and flue gas conditions. • Efficiency and pressure drop are relatively unaffected by large changes in inlet dust loadings for continuously cleaned filters. • Filter cake may improve fine particle, metals, chlorine and SO_2 removal. • Pre-coating of materials allows for collection of gaseous pollutants (i.e. SO_2). • No high voltage hazard simplifying maintenance and repair. • Relatively simple operation. • Not affected by kiln upsets (i.e. fuel surge resulting in higher amount of combustible gases).	• Higher operating costs. • Higher maintenance costs depending on bag life • Sensitive to high temperatures, thus requiring tight temperature control. • Some dusts in collector may pose fire or explosion hazard if spark or flame is accidentally admitted. • Plugging if dust is adhesive. • Tearing of bags may occur; bag can be taken offline and repaired with the remainder of the baghouse still operating, therefore not resulting in excessive PM emissions.

[211] Director's Record, Tab 3, Application No. 008-10339, Kiln Stack Particle Device.

[212] Director's Record, Tab 3, Application No. 008-10339, Kiln Stack Particle Device, in "Results from Literature Review," Table 1 and Table 2, at pages 3 and 4.

- Can be operated without a bypass, thus no upset emissions.
- Start-up conditions can be problematic for baghouses; can be mitigated through suitable procedures.

The Director was referred to these comparative tables during cross-examination, and accepted them as essentially accurate and as one of the pieces of information he relied upon in making his decision.[213]

[147] Alberta Environment's report also described the results of discussions between Alberta Environment and vendors of particle control devices:[214]

> "Pollution abatement equipment manufacturers/system designers were contacted by Alberta Environment staff and asked for feedback from their engineers regarding their preferences for either baghouses or ESP's as particulate control in cement plants.
>
> FLS Miljo who is a supplier of both ESP and baghouses for cement plants provided the most comprehensive response. Rather than paraphrasing Anders Benstrup of FLS miljo's (Denmark) response the following is cited:
>
> The preference in North America for dedusting of cement kilns has been baghouses and the preference in most of the rest of the world has been ESP's. Over the last 5-8 years we have however seen a dramatic shift in the rest of the world towards baghouses, and we think that the reasons for this are the following:
>
> Emission limits are decreasing meaning the relative size of the ESP increases whereas the baghouse has always achieved the low emissions.
>
> The plants are using alternative fuels, meaning lower emission limits and often requirements for adding activated carbon for precipitating heavy metals or even dioxins and furans (may not be present but some authorities require this)
>
> With alternative fuels there is more focus on fine PM and emissions during upset conditions.
>
> Many cities have expanded into the areas where the cement plants are located which again means more focus on emissions
>
> Pulse jet filter design has improved meaning the relative cost of the baghouses has gone down (In Europe the plants only buy pulse jet filters whereas in the US they still buy reverse-air baghouses).
>
> For a cement kiln, ESP water must be used for conditioning of the gas during operation without the raw mill running, meaning in areas where water is scarce

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213 Transcript, dated December 18, 2002, at page 487, lines 14 to 33 and page 488, lines 1 to 6.

214 Director' Record, Tab 3, Application No. 008-10339, Kiln Stack Particle Device, in "Results from Discussions with Particle Control Device Vendors", at pages 4 and 5.

the baghouse has an advantage.

> With the above reasons for shifting to baghouses the ESP does however still have the advantage of far lower maintenance cost as well as lower operation cost (mainly due to lower pressure drop). Furthermore, the operation of the ESP has improved significantly over the years with better controls during upset conditions.
>
> Responses obtained from other vendors contacted were in agreement with the statements made by Anders Benstrup of FLS miljo."

[148] In addition to visiting the Approval Holder's Edmonton facility, the Director also visited three western Canadian cement plants, the Lafarge-Exshaw (Exshaw, Alberta), Lafarge-Richmond (Richmond, British Columbia), and the Tilbury (Delta, British Columbia) cement plants. The Director set forth summaries for these cement plant visits,[215] and also provided a summary of the "results from cement plant site visits, and personal communications with other cement plants and regulatory agencies."[216] The Director's summary stated:[217]

> "The Lafarge plant in Richmond is an entirely modernized, state of the art facility that uses a baghouse for particle control. Performance of the equipment has been *excellent* and both the Greater Vancouver Regional District regulatory staff and plant personnel were very pleased with the outcome. Based on semi-annual stack surveys, typical particulate emissions ranged from 2-5 mg/Nm^3. The operators stated that as the bags approach their life expectancy, the particulate emissions may increase, but are expected to remain less than 35 mg/m3. Upset emissions from the baghouse were not reported to occur as the baghouse is operated without a bypass.
>
> The Tilbury plant and the Lafarge plant in Exshaw use electrostatic precipitators as the particle control device for the kiln stack. While particle removal under normal conditions was considered *adequate*, all plants experienced upsets and the associated increased emissions. The question remained if complete elimination of ESP trips and the associated significant upset emissions is technically feasible. The Lafarge Exshaw plant in Alberta decided to replace one of their ESPs with a baghouse, as the current ESP is undersized, which can lead to operational difficulties (i.e. trips). Lafarge will continue to operate with an ESP on their smaller kiln…."

Whatever the site visit did, it clearly showed that the industry in Alberta and British Columbia is switching to baghouse technology.

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215 See: Director's Record, Tab 3, Application No. 008-10339, reports entitled "Inland Cement Ltd. Site Visit", "Lafarge Canada Inc. Exshaw Site Visit", "Lafarge Richmond Cement Plant and Tilbury Cement Plant".

216 Director's Record, Tab 3, Application No. 008-10339, Kiln Stack Particle Device, at pages 5 and 6.

217 Director's Record, Tab 3, Application No. 008-10339, Kiln Stack Particle Device, at pages 5 and 6.

[149] The Approval Holder's own evidence provided to the Director was that its existing ESP was, even assuming it was well-maintained, beyond its "useful life.[218] Notwithstanding the Approval Holder's assertion that it has "an excellent ESP inspection and maintenance program that tracks corrosion and schedules repairs before the damage can affect performance", the actual performance record as set out earlier in this report also suggests this ESP is be beyond its useful life. Similarly, notwithstanding the Director's position taken at the hearing that the Approval Holder's ESP is "adequately sized for the changes that have been proposed", the evidence of ESP performance before this Board points to a finding that the ESP is not "adequately sized" even for its *current* operations. Indeed, the Approval Holder and the Director provided evidence during the hearing that its current ESP would not be capable of attaining the finer particulate capture of a new ESP even during normal operating conditions, and that it would build a bigger (more plates/oversized) ESP if it were to install a new one, particularly to address the capture of fine particulates.[219] The Board notes, in this regard, that the Director's Record indicates that the decision by Lafarge-Exshaw to replace one of the existing

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[218] Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), Appendix IX, Environmental Quality Management (May 2001), Particulate Emission Control Report, at page 7: "The useful life of the ESP box can be 15 to 20 years if properly maintained."

[219] Under cross-examination by the EFCL, the Director was asked about the ability of ESPs to achieve the low emissions of $PM_{2.5}$ from baghouses (as set out in the Director's report):

> "Mr. Fitch: … Over the last five to eight years, we have, however, seen a dramatic shift in the rest of the world towards baghouses and we think that the reasons for this are the following, and then there are a number of points. First, emission limits are decreasing, meaning the relative size of ESP increases, whereas the baghouse has always achieved the low emissions. And I would just like to ask a question about that.
>
> As I understand it, in order for an ESP to achieve under normal operating conditions the same type of efficiencies that a baghouse can achieve, you need to increase the size of the ESP. Is that your understanding, Mr. Singh?
>
> MR. SINGH: For finer particulates, yes that's my understanding.
>
> Mr. Fitch: And one of the facts about the Inland ESP is that it is not a modern large ESP. Is that your understanding?
>
> Mr. Singh: In terms of the ESP, if someone were to design one from scratch for a facility like this, one of the aspects they would likely consider is oversizing it to gain additional efficiencies, particularly for fine particulate."

Transcript, dated December 18, 2002, at page 488, lines 20 to 34 and page 489, lines 1 to 8.

> The Approval Holder provided similar evidence:
>
> "Dr. Hoenig: … I also mentioned before that if you would reconstruct a new ESP today it would look a little bit different from the ESP in 1976 that is here.
>
> Mr. Schulz: Could you touch on briefly how it would look different?
>
> Dr. Hoening: For example, the area could be larger.

ESPs with a baghouse, during its coal conversion project, was explained on the basis of similar circumstances: an undersized ESP/operating close to capacity and poor performance, including numerous trips.[220]

[150] As the Board set out in the earlier section on the need for conversion to coal, the primary reason for undertaking its Substitution Fuel Project, as stated by the Approval Holder, "is to allow the Inland operation in Edmonton to remain competitive with other cement manufacturers."[221] The Board noted the need for information necessary to undertake the required balancing under section 2 of the Act, and the related need for this type of information in undertaking an analysis in relation to BADT.

[151] In the Board's view, the Director had ample evidence before him to, at minimum, find that the baghouse was the most effective particulate control device for the Approval Holder's plant. The Board holds this view, notwithstanding the Director stating: (1) that he did not undertake his review to determine BADT, but instead to consider whether the Approval Holder's ESP is the most effective particulate control device for the Approval Holder's Edmonton plant; and, (2) then not answering his own question as to whether the existing ESP is the most effective particulate control device for the Approval Holder's Edmonton plant, but instead finding that both ESPs and baghouses can be used successfully to control particulate matter at cement plants with similar high efficiencies.[222]

Transcript, dated December 17, 2002, at pages 324, lines 9 to 21.

[220] See: Director's Record, Tab 3, Application No. 008-10339, Kiln Stack Particle Device, at pages 5 and 6: "The Lafarge Exshaw plant in Alberta decided to replace one of their ESPs with a baghouse, as the current ESP is undersized, which can lead to operational difficulties (i.e. trips). Lafarge will continue to operate with an ESP on their smaller kiln." In the Director's report from his site visit to the Lafarge-Exshaw cement plant, he provided:

> "The main Kiln 5 ESP will be replaced with a baghouse. … A baghouse was chosen for the following reasons:
>
> - cost of retrofit and size constraints, the current ESP was operating close to capacity,
> - improved performance;
> - expected improved removal of fines,
> - virtual elimination of upsets."

See: Director's Record, Tab 3, Application No. 008-10339, Lafarge Canada Inc. Exshaw, Site Visit, October 29, 2001, 9:00 – 14:00, at page 2.

[221] See: Director's Record, Tab 2, Inland Cement Limited Substitution Fuel Project- Public Disclosure Document, dated November 14, 2000, at page 6.

[222] Director's Submissions, dated November 15, 2002, paragraphs 86 to 89. See also: Transcript, dated December 18, 2002, at page 484, lines 34 and 35 and page 485, lines 1 to 11, where the Director provided a

[152] The Board's review of the Director's Record indicates that throughout the course of the review process, Alberta Environment sought more detailed comparative performance information from the Approval Holder that would have greatly assisted the Director in answering these very questions, and particularly the question of applicable BADT.[223] While the Board is aware that some of this information was requested as part of the screening process, this information was also to inform the Director in making his determinations on the issue of the

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somewhat different answer to whether he conducted a review of BADT: "Our review was with regards to the most appropriate emissions control equipment, specifically ESP versus baghouse. That would have an element of best available demonstrated technology. But our focus was what is the most appropriate, ESP or baghouse, for this site."

[223] See: Letter from Alberta Environment to Inland Cement Limited, dated September 27, 2000, where Inland is requested to "…provide a table comparing the predicted emission rates for the proposed project with the limits in the *CCME National Emission Guideline for Cement Kilns (1998)* and with *other cement manufacturing plants in Canada*." (Emphasis added.) In response, in a letter to Alberta Environment dated October 3, 2000, Inland provided a table stating there would be no changes to Inland's current emissions for SO_2, PM, PM_{10}, and $PM_{2.5}$ (except for a decrease in $N0_x$ and an increase in CO2) and a simple comparison *only* with its sister plant, Tilbury (who uses an ESP for all of its PM sources and is not a competitor). Inland then states that Tilbury is different because it does not use a precalciner. In the Board's view, this is an inadequate response. See also: Alberta Environment's letter to Inland, dated January 22, 2001, which indicates that specific comparative performance information was requested of Inland, and that Inland has indicated it has been unable to provide this comparative performance data. Alberta Environment had asked for:

> "- comparative performance data from plants using coal, no necessarily limited to plants with similar configuration to Inland;
>
> - using performance data from other coal fired cement plants estimate the increase in emissions; include all assumptions and calculations;
>
> - comparative data from the Redding and Tilbury plant and evaluate the performance of pollution control equipment given that a baghouse is used at the Redding facility and an ESP at Tilbury;
>
> - a review of alternatives to improve particulate capture during normal and especially during upset conditions, including consideration of baghouse technology."

The letter then provides:

> "We understand that you determined in January 2001, that you were unable to develop a suitable materials balance or to find useful comparative performance data from other plants. We also understand that you plan to produce a health risk assessment based on your emission estimates and that you plan to submit details of plans to improve ESP performance."

A list of "Information Clarifications" was attached to the letter, requesting that Inland provide, among others:

> "… a rationale for the unavailability of comparative performance data from cement plants using coal with coal consumption and clinker rates. Identify plants with similar configurations that use coal in their location; clear commitments from Inland to undertake the mitigation plans identified in the public disclosure and to improve particulate capture rates. Include a clear description of your preferred plans to improve ESP performance and a contingency plan that will be adopted (such as replacement of the ESP with more reliable technology) if ESP performance does not improve."

Inland responded to these information clarification requests by letter dated February 1, 2001. Importantly, in response to the request for clarification of the unavailability of comparative performance data, Inland responded: "Attached (binder) [Appendix A] is the data from California regarding health effects as done by a US agency." Unfortunately, Appendix A was not included in the Director's Record before this Board.

most effective particulate control device for the Approval Holder's Kiln Stack. The Board is also aware that in order to undertake a thorough consideration of BADT, the Director must have evidence of the relative benefits of various pollution abatement technologies in terms of reducing air emissions (here, particularly $PM_{2.5}$ and metals) and the relative costs.[224]

[153] The Director's record indicates to the Board that the Approval Holder was unwilling to respond in a substantive way to requests for some of this important information or to undertake any substantive discussion of these important issues.[225] Instead, the Director was left

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[224] Exhibit 27 provides various definitions of BADT. These definitions are summarized as follows:

- Air Toxics Management Program in Alberta, Alberta Environment, April 1998, at page 4: "best available demonstrated technology that is economically achievable for other air toxics."
- Canada Gazette Part 1, at page 329: "ensuring that new facilities and activities incorporate the best available economically feasible technologies to reduce PM and ozone levels."
- US *Environmental Protection Agency Clean Air Act*, section 169(3): "The term 'best available control technology' means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each pollutant."
- Environmental Management Systems – Specification with Guidance for Use, International Standard ISO 14001, First edition 1996 at page 8: "When considering their technological options, an organization may consider the use of best available technology where economically viable, cost-effective and judged appropriate."
- U.S. Environmental Protection Agency, Terms of the Environment: "Best Demonstrated Available Technology (BDAT): As identified by EPA, the most effective commercially available means of treating specific types of hazardous waste. The BADTs may change with advances in treatment technologies."
- ZKG International, Cement-Lime-Gypsum, No. 1/2000, Volume (2000) No. 1, pages 1 to 11: "Application of 'Best Available Techniques' in the German cement industry at page 3: In contract to the BATNEECs the term 'techniques in BAT' is taken to mean both the abatement technology applied and also the way in which a plant is designed, built, maintained, operated or shut down. This means that BAT covers the entire production process. Techniques are regarded as 'available' when they can be applied on an industrial scale. They have to be usable under economically and technically justifiable conditions. The BAT associated emission levels are not the same as the limits."
- The Dictionary of Environmental Law and Science, William A. Tilleman, Chair, Alberta Environmental Appeal Board, 1994 Emond Montgomery Publications Limited, Toronto, Canada, at page 32" "best demonstrated available technology (BDAT): As identified by EPA, the most effective commercially available means of treating specific types of hazardous waste. The BDATs may change with advances in treatment technologies."

[225] See also: Director's Record, Tab 2, Inland Cement Limited's Substitution Fuel Project Application to Amend Existing Approval (#10339-01-00), Inland Cement Response to Supplemental Information Request 1 – January 18, 2002, at Question 35:

> "Q.35 - Please address the following statements related to the Environmental Quality Management Report: *Application, Page K-1, Section K-1* (a) Emissions from fabric filtration and ESP's are equivalent with respect to particulate matter. Comment on the applicability of this statement with respect to PM_{10}, $PM_{2.5}$ and metals emissions.

with the burden of undertaking all of these comparisons, as set out in our reasons, through visits to western Canadian cement plants, literature reviews, discussions with pollution control technology manufacturers, and so on.

[154] This makes the Approval Holder's enthusiasm, evidenced by its submissions to this Board during the hearing that the issue of economics be considered as part of BADT, both inconsistent and curious.[226] These arguments appear to be contrary to the Approval Holder's own evidence given during the hearing that it submitted nothing formal to the Director on the relative costs of baghouses versus ESPs:

> "The Chairman: Have you submitted that information to Alberta Environment on costs on different options, what you know, within the framework of what best available demonstrated or control technology might be?
>
> Mr. Meagher: No, we haven't, certainly not formally. I may have passed that on in conversation somewhere but certainly we have not submitted that formally."[227]

Nor did the Approval Holder do any comparative modeling on relative emissions from its existing ESP, a new ESP or a new baghouse, or an additional baghouse:

> "Mr. Fitch: Now, Mr. Meagher, in Inland's application you say that you compared ESPs with fabric filtration?
>
> Mr. Meagher: That's correct. There's a report in the application.
>
> Mr. Fitch: That is the environmental quality management report?
>
> Mr. Meagher: I believe that is the name, yes.

> Response – With respect to PM_{10}, a properly operated ESP should eliminate most of the PM_{10} from the gas stream prior to discharge from the stack. Further information with respect to PM_{10} and metals; Inland's ESP removal efficiency can be found in the 1994 Environmental Quality Management Report. ESP's and baghouses are limited with respect to metal removal based up the state of the metal when it enters the equipment; vapors will not be effectively removed in either case. There is little information available on the removal efficiency of $PM_{2.5}$ from the gas stream. The operating temperature of the equipment will impact the removal efficiency of either a baghouse, or ESP. If the temperature is low enough to condense out the smaller particles there will be better removal efficiency, but if the temperature is not favorable for condensation, the particles will condense out of the gas stream after the pollution abatement equipment. Some further information can be found in the 1994 Environmental Quality Management Report."

The Board notes that the evidence provided by the Director from his internal review, and that presented by Dr. Church, points overwhelmingly to the advantage of a baghouse in removing $PM_{2.5}$, both during normal operations and during upsets conditions.

[226] Approval Holder's Submissions, dated November 15, 2002, at page 6, paragraph 30. See also: Transcript, dated December 18, 2002, at pages 563 to 565.

[227] Transcript, dated December 17, 2002, at page 357, lines 9 to 17.

> Mr. Fitch: Can you show us where in any of your application materials we can find a comparison of existing particulate emissions with estimated particulate emissions where a fabric filter is used? Do you follow my question?
>
> Mr. Meagher: I'm not sure. Would you try it again?
>
> Mr. Fitch: Did you estimate anywhere when you were doing this comparison of fabric filters with ESPs, did you estimate anywhere what you might be able to achieve with a new fabric filter?
>
> Mr. Meagher: Not that I can recall unless Martin – no, I can't recall. I don't believe there's anything in there." [228]

In essence, the Approval Holder premises its need to convert to coal on competitiveness grounds and claims that a consideration of BADT must include a consideration of economics– they remain, however, unwilling to entertain any substantive comparative analysis of the two technologies being used in the industry – with baghouses being used by its two geographically closest competitors.

[155] The Approval Holder also made no substantive attempts during the hearing to contribute any reliable or detailed evidence to the Board on this important question. In response to questioning from the Board, Inland was unable to provide any evidence on these relative costs, or on the amount of money spent on its current ESP, other than to say at the hearing that both a new ESP and a new baghouse would cost 15 million dollars.[229] The Director also suggested a figure of 15 million dollars as the cost given by Lafarge-Exshaw for replacement of one of its ESPs with a fabric filter baghouse.[230] However, all of the evidence in the Record and that given before this Board, suggested that, while historically the overall costs were higher for the baghouse, in recent years the costs appear to be approaching that of the ESP and baghouses are doing a better job.[231] This appears to be related partly to increased costs associated with "over-

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228 Transcript, dated December 17, 2002 at page 296, line 33 and page 297, lines 1 to 19.

229 Transcript, dated December 17, 2002, at page 352, lines 12 to 35, and page 357, lines 1 to 17.

230 Transcript, dated December 18, 2002, at page 562, lines 16 to 21.

231 In his direct evidence, Mr. Church, an industrial air emissions control device witness for the EFCL, stated the following:

> "Mr. Fitch: Next, Inland has stated that baghouses or fabric filters have higher operating costs and this is cited as an advantage of ESPs. Can you comment on that?
>
> Mr. Church: Traditionally I think that is true. The operating costs on an ESP versus a baghouse are to do with the pressure drop you have to place on the baghouse. A baghouse operates on a pressure drop which is equivalent to six to ten inches of water, which is a horse power issue with the fans that have to drive it, so its is not only kilowatts required there. The

sizing" ESPs in order to achieve particulate control comparable to those attainable by baghouses,[232] and to lower maintenance costs associated with baghouses due to better fabric filter design resulting in lower change-out rates.[233]

[156] On this point, the Board found Mr. Church, a witness for the EFCL on the issue of industrial air emission control devices, a reliable and credible witness. The Board is therefore willing to accept his evidence as it relates to the comparative efficiencies and costs of baghouses versus ESPs,[234] and to accept this evidence in addressing any of the gaps in the Director's Record necessary to undertake an analysis of BADT.

[157] As set out earlier in this Report and Recommendations, the Director indicated in his written submissions that it was his position that the performance of the Approval Holder's ESP was "satisfactory" or "acceptable" during normal operations, and "of concern" during trips. The Director then indicated in his oral submissions that the ESP was "adequately sized for the changes proposed", and that it was therefore an "existing piece of equipment",[235] and as such, "with the fuel change it did not require the replacement of an ESP or a control system."[236] In the Director's opinion, it followed therefore that he did not have to undertake a determination of BADT.[237] We disagree.

> corresponding ESP might operate at 1 inch so there is quite a big difference. However, as things go, the baghouse is typically cheaper to install, interestingly enough, if you are starting with a green fields and they are becoming more and more reliable with a lower maintenance issues associated with them and it is now getting to the point where the curves are beginning to cross. Although you may have higher pressure losses, the overall cost of the baghouse is actually not necessarily any greater than the ESP and certainly, by performance, it is doing a better job."

Transcript, dated December 17, 2002, at page 165, lines 20 to 35, and page 166, lines 1 to 6.

232 Director's Record, Tab 3, Application No. 008-10339, Kiln Stack Particle Device, at page 3, Table 1: Advantages and Disadvantages of ESP's, it is noted under the "disadvantages" side of the table: "- high capital costs especially when high efficiencies are desired … large size required for collection of fine PM.…"

233 Responses from vendors to Alberta Environment on their preferences for either baghouses or ESPs included agreement that part of the reason for the dramatic shift in the rest of the world to baghouses could be: "… emission limits are decreasing meaning the relative size of the ESP increases whereas the baghouse has always achieved the low emissions … [and] pulse jet filter design has improved meaning the cost of baghouses has gone down…." See: Director's Record, Tab 3, Application No. 008-10339, Kiln Stack Particle Device, at page 5.

234 Transcript, dated December 17, 2002, at pages 159 to 168.

235 Transcript, dated December 18, 2002, at page 528, lines 14 to 19.

236 Transcript, dated December 18, 2002, at page 528, lines 6 to 9.

237 Transcript, dated December 18, 2002, at page 527, lines 24 to 34 and page 528, lines 1 to 19.

[158] As the Board also stated earlier in this Report and Recommendations, the Board finds the performance of the Approval Holder's ESP unacceptable. Given this unacceptable performance, and given the age of the ESP, the Board cannot accept that the ESP can be considered "adequately sized", even for its current purpose. Certainly, it cannot be considered "adequately sized for the changes proposed." In the Board's opinion, this piece of control equipment *did* require replacement.

[159] Notwithstanding that the Director appears not to have undertaken a complete consideration of BADT for the Approval Holder's facility, as we believe that he is required to do pursuant to Alberta Environment's policy and ultimately under section 2 of EPEA,[238] the Board finds that there is sufficient evidence before the Board, based on the Director's Record and the evidence provided to the Board during the hearing, to make a determination of BADT.

[160] As set out earlier in this Report and Recommendations, there is little doubt that the baghouse is clearly advantageous in terms of providing increased capture and, therefore, lowering emissions of $PM_{2.5}$, which as we identified is a potential concern to human health. While ESP efficiency is very sensitive to cement kiln upsets involving changes to flue gas composition, a baghouse is generally not affected by these upsets. The costs, as set out in the Director's Record, and as provided during the hearing, while historically higher in terms of maintenance costs for the baghouse, are now becoming increasingly comparable in terms of the overall costs for ESPs and baghouses. When applied to the specific circumstances of the Approval Holder's facility: its location upwind of and within a large city; its history of dusting incidents associated with the existing ESP and its sub-optimal particulate matter removal efficiencies due to flue gas conditioning problems at the facility; evidence before the board that the ESP performance has not improved to even an acceptable or satisfactory degree; together with the potential aggravating factors of a fuel switch to the already poor performance – the Board finds that a baghouse is BADT for the Kiln Stack.

[161] In summary, taking into account the economic costs and the environmental benefits of a baghouse versus the ESP, and also taking into account the circumstances of the Approval Holder's Edmonton cement plant, the Board finds that a fabric filter baghouse is

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[238] Transcript, dated December 18, 2002, at pages 523 to 529.

BADT for the Approval Holder's Kiln Stack and must be used. The Board therefore recommends that the Approval Holder's existing ESP be replaced by a fabric filter baghouse as soon as possible.

[162] In making this decision, the Board notes that during the Hearing the Director appeared, to have some uncertainty as to whether he should require BADT in cases such as this. (On many points, in answering questions the Director relied on Ms. Sartori for assistance.)[239] It appears clear to the Board that as stated in the Director's own submission, "Alberta Environment requires that facility operators minimize emissions through use of best available demonstrate technology."[240] However, as the Board noted previously, in responses to questions from his own counsel and counsel for the EFCL, the Director was very deliberate in his wording to state that in his view the ESP was the "appropriate particulate control device"[241] or the "most acceptable particulate control technology."[242] The Board wishes to be clear, having regard to all of the evidence, that we are of the view that the most "appropriate particulate control device" and the "most acceptable particulate control technology" in these circumstances is a baghouse.

F. Timeline for Installation of a Baghouse

1. Hearing Submissions

[163] The Appellants argued that a baghouse should be installed immediately. The Approval Holder argued that it will be difficult for it to meet the 20 month deadline currently set out in the Approval.[243] The Director argued this period of time is appropriate in addressing the

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239 Transcript, dated December 18, 2002, at page 514, lines 16 to 24, the Chairman observed that Ms. Sartori was providing considerable assistance to Mr. Singh in answering questions:

> "Mr. Singh: I will get Ms. Sartori to answer some of the detailed items.
>
> The Chairman: That's what I have been wanting to ask her all afternoon but I have politely stayed out of the foray. Ms. Sartori has seemed to have been a good advisor to you today as well as previously. Is that true, Mr. Singh?
>
> Mr. Singh: Very much, yes.
>
> The Chairman: Ms. Sartori."

240 Director's Submission, dated November 15, 2002, at paragraph 86.

241 Transcript, dated December 18, 2002, at pages 428 to 427.

242 Transcript, dated December 18, 2002, at pages 488 to 486.

243 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 33.

timelines necessary for the Approval Holder to plan, design, procure, install and commission the baghouse system.

2. Analysis

[164] The Board is concerned that the ongoing poor performance of the Approval Holder's existing ESP be addressed as quickly as possible through the installation of a fabric filter baghouse. This is particularly important given the potential compounding issues associated with a fuel change on the already poor performance of this ESP device. Given the Board believes that the Director should have required the installation of a fabric filter baghouse on the Kiln Stack as part of the Substitution Fuel Project concurrent with the fuel switch, and given the Board's understanding that the Approval Holder intends to begin burning coal after its January plant shut-down, the Board is of the view that there needs to be some mechanism in place to ensure that the current ESP reduction plan is fully implemented such that, notwithstanding its overall inability to adequately address the particulate problems associated with the ESP, the very high particulate matter releases and impacts associated with those upsets can be avoided during the period of time before the baghouse can be operational.

[165] The Board also recognizes that the planning, engineering, and procurement process associated with the installation of a baghouse will take some time, and the Board accepts the Director's decision with regard to the appropriate amount of time (20 months) to enable the Approval Holder to do so. However, having said this, *in the strongest terms possible, the Board recommends that the baghouse be installed and operational as soon as possible.* The Board is of the view that the Approval Holder should move to install a baghouse as quickly as possible to limit any potential impacts on the surrounding population. For now, the Board is prepared to accept the Director's determination that it is reasonable that the Approval Holder will require 20 months to install the baghouse as specified in condition 4.1.37 of the Approval.[244]

[166] However, in order to ensure that any potential impacts on the surrounding population are limited as much as possible, the Board is of the view that, in the event the Approval Holder exceeds six trips in any calendar year before the baghouse is operational, the

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[244] Director's Submission, dated November 15, 2002, at page 20, paragraph 96. See also: Director's Record, Tab 1, Approval No. 10339-01-03, dated May 24, 2002, Approval Clause 4.1.37.

Approval Holder should immediately provide a report to the Director and the Director should revisit the amount of time required to install the baghouse and reduce it if possible.[245] *Under no circumstance does the Board believe that it would be acceptable to extend the 20 month deadline. The baghouse must be installed and in operation no later than 20 months from the date of the Minister's Order.*

[167] Further, because of the concerns about peak particulate emissions, the Board is of the view that the baghouse must be designed to operate without a bypass as was done with Lafarge Richmond Plant that the Director visited. The Board also notes that there may be some benefit in keeping the ESP shell as a buffering chamber upstream of the baghouse and the merits of this option should be evaluated by the Approval Holder and reviewed with the Director.

[168] Finally, the Board notes that the number of trips that are currently authorized by the Approval before the baghouse is required to be built is specified as 10 trips in 2003, 8 trips in 2004, and six trips in 2005 and each subsequent year. Mr. Meagher testified that in 2002 the Approval Holder managed to reduce the number of trips to six. The Board is therefore of the view that the number of allowable trips that should be permitted until the baghouse has been constructed and is operational is six per calendar year. The Board is also of the view that the number of allowable trips that should be permitted until the baghouse has been constructed is six per calendar year because, as we have stated, we believe that the number of trips that are currently being measured represents an underestimation of the non-optimal operation of the ESP.[246]

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[245] It should be noted that Approval Clause 4.1.32 provides that during the initial commissioning period of 90 days that five additional trips are allowable. While the Board encourages the Approval Holder to take steps to keep the number of trips during this period to a minimum, the Board is prepared to accept the Director's decision in this regard, and confirms that such trips will not be included in the number of trips that will trigger a review of the timing of the baghouse by the Director.

[246] Again, the Board is of the view that during the initial commissioning phase, additional trips will be permitted as currently authorized by section 4.1.32.

G. Local Residents Trip Notification System

1. Hearing Submissions

[169] The EFCL argued that the Director should have required the Approval Holder to implement a notification system of the occurrences of the ESP trips to enable those residents with health conditions to take the necessary steps to protect themselves. EFONES argued that notification by mail is unacceptable, and residents should have access to air quality reports from home through the internet or telephone.[247] The EFCL submitted that the Approval Holder should be proactive in providing as much warning as possible to the surrounding residents of a dusting event, and the Approval Holder should provide funding to maintain the system. The EFCL further stated that the " …Director's failure to order a resident notification system is, it is submitted, symptomatic of his failure to give due consideration to the views of local residents."[248]

[170] The Approval Holder submitted that a notification system would not be practical or of any benefit as the trips are of short duration and there is a strict limit on the number of trips.

[171] Similarly, the Director stated that he had considered a residents notification system in the event of an ESP trip but concluded such a system would not be practical as most dusting events are of very short duration and the number of trips is expected to decrease. The Director also considered that "…a requirement of this nature could unnecessarily alarm the public."[249]

2. Analysis

[172] In light of the Board's recommendation that a baghouse be installed to replace the Approval Holder's ESP, and the fact that baghouses are not affected by upset conditions such that they "trip" like an ESP, the issue of a local residents trip notification system becomes moot once the baghouse is operational. However, until then, the Board accepts the argument that

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247 EFONES' Submission, dated November 15, 2002, Affidavit of Mr. Stan Kondratiuk, dated November 11, 2002, at page 3, and Affidavit of Mr. Cameron Wakefield, dated November 13, 2002, at paragraph 10.

248 EFCL's Submission, dated November 15, 2002, at paragraph 34.

249 Director's Submission, dated November 15, 2002, at paragraph 99.

local residents have the right to know when a trip has occurred. As a result, the Board will recommend that until the baghouse is operational, the Approval Holder should develop a local residents trip notification system to the satisfaction of the Director. The trip notification system should only contact those residents that request to be advised of such trips.

H. Local Residents Liaison Committee

1. Hearing Submissions

[173] The Appellants submitted that the Approval Holder should be required to establish a community liaison committee to help alleviate fears and mistrust that exist in the neighbouring communities. They argued that past actions of the Approval Holder and the lack of ongoing community involvement in the appeal process have resulted in this lack of trust.[250]

[174] The EFCL offered to assist in establishing and operating a committee providing the Approval Holder was interested in genuine dialogue with the communities and the communities "…having real input."[251] The EFCL argued that a liaison committee would alleviate fears of the residents as information would be shared and actions taken if needed. The EFCL submitted that one of the major initiatives that would be undertaken would be the establishment of a notification system.

[175] The EFCL stated that residents in the area had never been contacted by Inland in the past regarding emissions and dusting events.[252] Residents expressed concerns regarding their health and argued that the conversion will be "…to the economic benefit of the company at the expense of my health, enjoyment of my property and risk to the environment."[253]

[176] The Approval Holder argued that imposing a consultation framework in the Approval will prevent the "…benefits that are normally derived from voluntary and good faith consultations…" from being realized.[254] It further stated that it recognizes the importance of

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250 See: Mr. Neil Hayes' Submission, dated November 15, 2002 and EFCL's Submission, dated November 15, 2002, Statement of Ms. Anna Krug and Statement of Ms. Bonnie Quinn.

251 EFCL's Submission, dated November 15, 2002, at paragraph 35.

252 EFCL's Submission, dated November 15, 2002, Statement of Ms. Anna Krug, at page 1 and Statement of Ms. Bonnie Quinn, at page 1.

253 EFCL's Submission, dated November 15, 2002, Statement of Ms. Anna Krug, at page 3.

254 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 46.

being involved in the community and community consultation, and considered the updated heath assessment as an important first step.

[177] The Director stated that he had considered the need to establish a formal ongoing consultation mechanism, but decided against including it as a condition in the Approval.

2. Analysis

[178] At the hearing, the Approval Holder agreed that on-going consultation with the local residents was a useful idea and that some form of Local Residents Liaison Committee would be an acceptable method of accomplishing this. Mr. Meagher stated:

> "Mr. Fitch: Now, it has been mentioned that Inland is prepared to engage in a community liaison committee. Can I read to you the proposal that I put to your counsel earlier this week and just ask you if that sounds okay to you.
>
> What we said was the purpose of this committee was to provide a forum for the company and the community to have ongoing discussions about the quality of impacts on life. Membership would consist of a maximum of 12 members. The committee would meet quarterly. Minutes of the meeting will be provided to Alberta Environment and the Edmonton Federation of Community Leagues. More detailed terms of reference of the committee would be detailed by the committee members themselves.
>
> Mr. Meagher: I read that letter yesterday. I think the framework is fine. I asked a couple of questions about it. I don't know that 12 is a correct number. I'm not suggesting any other number. I'm saying 12 is the correct number. I did expand a bit on the numbers. We should have people from the environmental community in town, and there should be people from the businesses around the plant area. So, basically, the framework sounds fine.
>
> Mr. Fitch: The framework sounds fine but except you would add people from the environmental community and the business community?
>
> Mr.. Meagher: And somebody from Alberta Environment I would suggest would expand the range of the members." [255]

[179] The Board notes that the Director stated that such conditions generally are not included in approvals, and forcing the Approval Holder to create a consultation mechanism is "…bound to be less successful."[256] In the Board's view, while this may sometimes be true, it is

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[255] Transcript, dated December 17, 2002, at page 314, lines 14 to 34, and page 315, lines 1 to 15.

[256] Director's Submission, dated November 15, 2002, at paragraph 108.

not always true. The Board notes that in the *Bailey* case, Director Ostertag chose to create such a committee.[257]

[180] The Board agrees with the Approval Holder that a Local Residents Liaison Committee is appropriate and will recommend that the Approval Holder establish and fund an ongoing Local Residents Liaison Committee to the satisfaction of the Director.

I. Emission Limits

1. Hearing Submissions

[181] The Appellants argued that the limits allowed in the Approval are too high, and the Director should have considered the location of the facility before setting the emission limits. Mr. Neil Hayes submitted the limits should be lowered to California standards.[258]

[182] Mr. Hayes submitted that the Approval Holder is the "…oldest, most outdated cement plant allowed to operate with such high emission limits."[259] Mr. Hayes further stated that any large plants operating near a metropolitan area are required to use the best available technology and are subject to stricter environmental controls than what has been imposed on the Approval Holder. Mr. Hayes further submitted that environmental standards need to be properly enforced.

[183] EFONES expressed concerns that the Approval Holder did not provide actual values for particulate matter released when burning natural gas. According to EFONES, the data provided indicate that there are, and will continue to be, emissions that will exceed guidelines for

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257 *Bailey et al. #2* v. *Director, Northern East Slopes Region, Environmental Service, Alberta Environment*, re: *TransAlta Utilities* (May 18, 2001), Appeal Nos. 00-074, 077, 078, and 01-001-005-R (A.E.A.B.).

258 Mr. Neil Hayes' Submission, received November 15, 2002. According to Mr. Hayes, the new standards set by the California Air Resources Board for particulate matter are:

"
- a PM_{10} annual-average standard of 20 micrograms per cubic meter (mg/m3) [*sic*], not to be exceeded;
- a new $PM_{2.5}$ annual-average standard of 12 micrograms per cubic meter, not to be exceeded;
- retention of the 24-hour PM_{10} standard of 50 micrograms per cubic meter, not to be exceeded.
- retention of the Sulfates 24-hour average standard of 25 micrograms per cubic meter."

259 Mr. Neil Hayes' Submission, received November 15, 2002.

TSP, $PM_{2.5}$ and PM_{10} and these exceedances "…will cause significant health effects including death."[260]

[184] A witness for EFONES pointed out that the Approval Holder had indicated in its application that the maximum 24 hour concentrations for PM_{10} and $PM_{2.5}$, 50 ug/m^3 and 30 ug/m^3 respectively, could exceed guidelines, but there was no clear indication of by how much or how often.[261]

[185] EFONES argued that no absolute limits have been set for the Approval Holder, as it is allowed to "…emit a set amount of substance per unit of effluent."[262] EFONES further argued that the Director made an error in granting the Approval as many of the Approval Holder's predicted emission levels will exceed guidelines.

[186] EFONES stated that the recommended reference levels, or the "…levels above which effects on human health and the environment can be demonstrated…",[263] determined by the Federal/Provincial Working Group on Air Quality Objectives and Guidelines are:

"i) 25 ug/m^3 for PM_{10}; and

ii) 15 ug/m^3 for $PM_{2.5}$."[264]

[187] EFONES submitted that even with the Approval Holder exceeding the guidelines for several years, the Director did not require the Approval Holder to take any further steps to reduce the levels of particulate emissions.

[188] The EFCL also expressed concerns regarding the emission levels that the Approval Holder predicted would increase when coal is used as a fuel source. These included SO_2, TSP, PM_{10}, and $PM_{2.5}$. The EFCL stated that there are significant problems when the ESP malfunctions or trips as the Approval Holder estimated the "…PM emissions totaled 191 tonnes

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260 EFONES' Submission, dated November 15, 2002, at paragraph 20.

261 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraphs 12 and 14.

262 EFONES' Submission, dated November 15, 2002, at paragraph 24.

263 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraph 15.

264 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraph 16.

during the trips compared to 238.5 tonnes for the entire rest of the year,"[265] and yet the Director allowed the Approval Holder to continue using the ESP. A witness for the EFCL stated that according to "…a report prepared by the city administration, the burning of coal by Inland Cement will result in an increase of airborne heavy metals, such as lead, arsenic, chromium and mercury."[266] In City Councillor Mr.Allan Bolstad's submission, an attached document states that the "…Capital Health Authority will be making a submission to Alberta Environment from a public health perspective."[267]

[189] The Approval Holder argued that the emission limits in the Approval are stringent, but are obtainable, and are consistent with similar facilities operating under similar conditions. It emphasized the fact that the facility is located in a heavy industrial area, and the nearest residential communities are approximately two kilometres from the plant site.[268]

[190] The Director stated that the approach used in developing industrial release limits for approvals includes the following principles:

> "(a) limits will be established based on limits achievable using the most effective demonstrated pollution prevention/control technologies or the limits required to meet risk based, scientifically defensible ambient air quality guidelines, whichever are more stringent;
>
> (b) Alberta Environment will consider any relevant sector-specific technology based limits from other jurisdictions in developing a technology based release limit; and
>
> (c) When developing a technology based release limit for which no relevant sector specific limit exists, Alberta Environment will consider case-specific technology based limits."[269]

[191] With respect to the limits set for particulate matter, the Director argued that even though the Substitution Fuel Project will result in an increase in the number of point sources of

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265 See: EFCL's Submission, dated November 15, 2002, at paragraph 10.

266 EFCL's Submission, dated November 15, 2002, Statement of Mr. Allan Bolstad, at page 1.

267 EFCL's Submission, dated November 15, 2002, Statement of Mr. Allan Bolstad, Air Quality in Edmonton, at page 2.

268 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 2, 8, and 9.

269 Director's Submission, dated November 15, 2002, at paragraph 17.

particulate matter, he expects an overall reduction in these emissions as there is a requirement to reduce the number of trips and fugitive emissions.[270]

[192] The Director stated that the fuel conversion is not expected to significantly increase SO_2 emissions. Conditions were included in the Approval to limit SO_2 emissions for the three fuels (natural gas, coal, and petroleum coke) and the Approval Holder is required to continuously monitor SO_2 emissions.[271]

[193] The Director submitted that NO_x emissions typically decrease when coal is burned rather than gas, but the expected reduction will be less for a pre-calciner kiln such as the one used at Inland. After reviewing the CCME guidelines and limits established for other cement facilities, the Director set a limit of 7.4 tonnes per day based on a monthly average. According to the Director, this is considerably less that the CCME Guideline and more stringent than limits set for other facilities.[272]

[194] The Director does not anticipate a significant change in the emission levels of heavy metals, as it is the raw material used that is the major source of heavy metals. According to the Director, he requested the Approval Holder complete a number of stack surveys for metals to establish baseline data prior to the implementation of the Substitution Fuel Project. The levels measured were within guideline limits, and the Director set the limits in the Approval as recommended by the CCME and the levels are to be measured six months after implementation of the Substitution Fuel Project and annually thereafter.[273]

2. Analysis

[195] The Board will first address the issue of emission limits for particulate matter. There will be three main point sources of particulate emissions at the Approval Holder's plant, after conversion to coal. These are particulate emissions from the Kiln Stack, the clinker cooler stack, and the new 40 metre tall coal mill stack. A baghouse, installed in 1997, to control

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270 See: Director's Submission, dated November 15, 2002, at paragraph 25.

271 See: Director's Submission, dated November 15, 2002, at paragraphs 27 and 30.

272 See: Director's Submission, dated November 15, 2002, at paragraphs 35 to 40.

273 See: Director's Submission, dated November 15, 2002, at paragraphs 42 to 47.

particulate matter is used on the clinker cooler, and another baghouse will be used on the new coal mill stack. [274]

[196] As set out earlier, the Board is recommending that the Approval Holder's existing electrostatic precipitator, installed in 1979, currently used to control particulate emissions on the Kiln Stack, be replaced as quickly as possible with a baghouse, and in any event within 20 months of the date of the Minister's Order in these appeals.

[197] The amended Approval maintains the existing particulate emission limits at 0.07 grams of particulate per kilogram of effluent for the Approval Holder's Kiln Stack, and 0.06 grams of particulate per kilogram of effluent for the clinker cooler stack. The new coal mill stack, which will employ a baghouse for particulate control, includes new emission limits of 0.03 grams per kilogram of effluent. Importantly, the Board notes that the Director states that in retaining the existing emission limits for the Kiln Stack and clinker cooler stack, and setting this markedly lower emission limit for the new coal mill stack:

> "The CCME *National Emission Guideline for Cement Kilns* (March 1998), suggests that particulate emissions from new or significantly modified large capacity kilns should not exceed 0.2 kg per tonne of clinker from the stack and 0.1 kg per tonne from the clinker cooling stack. The particulate emission limits for the kiln (D) stack and the clinker cooler (Dx) stack in place previous to Inland's application were consistent with this Guideline. This Guideline does not address performance standards for pollution abatement equipment associated with coal milling and drying facilities.
>
> In evaluating an appropriate emission limit for the new coal mill (Dy) stack, the Director had regard to the expected particulate removal efficiency of the baghouse in this control application and the particulate concentration limit of 35 mg/m^3 specified in the permit for Lafarge Richmond B.C. facility."[275]

[198] The Board notes that while the Director appears to have maintained the emission rates for the Kiln Stack in the Approval, he has also allowed this emission rate to stand even in the event of the installation of a baghouse.[276]

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[274] Director's Submission, dated November 15, 2002, at paragraphs 23, and 90 through 94. See also, Approval Clauses 4.1.31 to 4.1.37.

[275] Director's Submission, dated November 15, 2002, at paragraphs 20 and 21.

[276] Footnote 2 to Table 4.1.C: Stack Emission Limits, Approval No. 10339-01-03 at page 14 provides: "The particulate limits for kiln (D) stack are applicable if an ESP or baghouse is used for particulate removal from the kiln effluent stream."

[199] As the Board set out earlier in this Report and Recommendations, the emission limits set for the Kiln Stack are problematic given the Director's own policy on setting these kinds of limits. An emission limit for particulates of 0.07 g/kg effluent, or 90 mg/m^3, appears to be out-of-line with the best average achievable emission rates for ESPs (5 to15 mg/m^3) and for baghouses (3 to 5 mg/m^3). It is also almost three times as high as the emission limit set for the Lafarge-Richmond cement plant (35 mg/m^3), even though that cement plant control equipment is operating most of the time at about 15 to 20 percent of its limit. The Approval Holder also provided evidence demonstrating that its Edmonton plant was operating less efficiently in terms of particulate matter emissions than almost every German cement plant. A copy of the graph presented by the Approval Holder is attached as Appendix to this Report and Recommendations. The Board cannot find a reason why the affected residents of Edmonton should be environmentally worse off than residents of Germany.

[200] In response to questions from the Board, the Approval Holder admitted that, according to its modeling, ten percent of the total nitrogen oxides will be coming from the Approval Holder's Edmonton plant, and almost all of the sulphur dioxide (in terms of maximum hourly concentration).[277] In terms of metals, almost all of the concentration ratio for arsenic (a known carcinogen) and thallium (central nervous system and skin irritant) is being contributed by the Approval Holder.[278] The Board also heard from the Director that air monitoring conducted at the Dovercourt site (Dovercourt is the closest residential community down-wind from the Approval Holder's cement plant) showed the highest maximum 24-hour concentrations for arsenic from $PM_{2.5}$ samples.

[201] As set out earlier, the Board finds that the emission limits set for particulate matter are not in accord with the approach required of the Director as set out in the *Industrial Release Limits Policy* and the Board is of the view that emission limits should be reviewed.

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277 Transcript, dated December 17, 2002, at page 349, lines 2 to 13. See also: Exhibit #17, "Human Health Risk Assessment for Lehigh Inland Cement Limited Substitution Fuel Project" – Cantox – Powerpoint Presentation, Table ES-1 at page 4.

278 Transcript, dated December 17, 2002, at page 349, lines 14 to 19. See also, Exhibit #17, "Human Health Risk Assessment for Lehigh Inland Cement Limited Substitution Fuel Project" – Cantox – Powerpoint Presentation, Table ES-4 at page 5.

J. Adequacy of Existing Baseline Data

1. Hearing Submissions

[202] The Appellants submitted that the Director had insufficient information when he made his decision to grant the Approval.

[203] EFONES submitted that data collected by the Alberta Environment mobile monitoring unit showed exceedances of TSP, PM_{10}, and $PM_{2.5}$ south of Inland, and the Director did not take these data into account in his decision.[279]

[204] The Appellants recommended that a continuous monitoring system be installed. Mr. Hayes also stated that three monitoring stations should be installed in the direct line of the prevailing winds at one, three, and five kilometre distances from Inland.

[205] EFONES argued the Director did not complete any independent studies and failed to review data provided to other branches of Alberta Environment, including incident reports and stack emissions. They submitted that the application was incomplete, as the Director, at the time of the advertisement, had not been provided with "…an Ambient Monitoring Plan, Fugitive Emissions Plan or Health Assessment."[280] EFONES argued that the Director decided to grant the Approval with only some of the information, and the public, including those who filed Statements of Concern, was not notified when new information was provided nor when the application was complete. The new information requested by the Director and provided by the Approval Holder indicated:

> "- increases in predicted ground level TSP, NO_X and SO2 concentrations and increases in the total area affected;
>
> - increases in TSP, PM_{10} and $PM_{2.5}$ concentrations at all community receptors during upset conditions; and
>
> - increases in metal emissions."[281]

[206] The EFCL argued that the Director did not have sufficient information before him regarding the health effects of burning coal and/or petroleum coke in an urban area. The EFCL

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279 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraphs 32 to 34.

280 EFONES' Submission, dated November 15, 2002, at paragraph 53.

281 EFONES' Submission, dated November 15, 2002, at paragraph 47.

submitted the Director does not have any information on the current health status of the residents in the area and whether Inland is affecting, or has, affected residents' health. The EFCL stated the "…primary reason most residents objected to the proposal to burn coal was their concern that the increased emissions associated with burning coal might adversely affect their health."[282] According to the EFCL, in a survey they conducted, they found that "…virtually every household that responded to the questions in the survey on health reported some chronic illness (mostly respiratory) and that all of them believed their illness are exacerbated by emissions from Inland Cement to one degree or another."[283] (Emphasis in the original.)

[207] The EFCL further submitted that there is real evidence to indicate that the health of the residents in adjacent neighbourhoods are already being affected by emissions from Inland, and the Director should not have relied solely on predictions and risk assessments. The EFCL argued that they are concerned for the health of those growing up in the vicinity of Inland and that the requirement to "…submit a proposal to update the 'screening level risk assessment'…" was inadequate.

[208] The EFCL also argued that the data provided by Inland in support of its application was unreliable or unsatisfactory. This was based on the assessment completed by one of EFCL's witnesses, who stated that the articles referred to by Inland in its application were difficult to find, were written by Inland's, or its parent company's, own scientists, and the articles did not appear to be refereed papers.[284] The EFCL stated the Substitution Fuel Project should not be allowed to proceed until the residents in the adjacent communities are given "..thorough, properly documented, independently researched and reviewed information with respect to the impacts and risks of converting to coal…."[285] The EFCL continued that the Approval Holder based its assumptions on less than adequate and objective materials.[286]

[209] In response to the issue of existing baseline data, the Approval Holder explained the manner in which particulate matter and trace metals in emissions were determined. It

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282 EFCL's Submission, dated November 15, 2002, at paragraph 23.

283 EFCL's Submission, dated November 15, 2002, at paragraph 25.

284 See: EFCL's Submission, dated November 15, 2002, at page 8, and Report of Mr. Edo Nyland, at page 3.

285 EFCL's Submission, dated November 15, 2002, at page 8.

286 EFCL's Submission, dated November 15, 2002, at page 10.

concluded by stating that "…there is no evidence whatsoever which supports the view that existing baseline data was inadequate."[287]

[210] The Director submitted that he had "…sufficient baseline data upon which to base his approval decision."[288] The Director argued his decision was based on information "…superior to that typical of EPEA approval applications," because additional stack surveys for metals were completed by Inland and modeling was verified by the Director's staff and through the Northwest Edmonton Air Monitoring Survey.[289]

[211] The Director stated the primary source of information on baseline air quality was the air dispersion modeling completed by the Approval Holder. However, the Director also used data from an air monitoring survey that was initiated by Alberta Environment due to the public concerns about air emissions from Inland. The objectives of the survey were to "…determine air quality levels downwind of Inland Cement and Yellowhead Trail, determine background air quality levels in northwest Edmonton, and compare these levels to Alberta's air quality guidelines and to data collected at Alberta Environment's permanent air quality monitoring stations in Edmonton."[290] According to the Director, the interim report on the survey indicates that "…$PM_{2.5}$ is likely not significantly influenced by emissions originating from Inland's Edmonton cement plant," and the substantially higher levels measured at the Polytubes plant may be due to "…activities at Inland Cement, dust from local traffic on service roads, vehicle traffic on Yellowhead Trail, the municipal landfill that is adjacent to Inland Cement, and other small industries."[291]

[212] The Director outlined the additional ambient air quality monitoring for particulates (PM_{10} and $PM_{2.5}$) implemented by Inland in June 2001, both at the fenceline and off-site.[292] The Director also indicated that in response to public concern, Alberta Environment

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287 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 11 and 12.

288 Director's Submission, dated November 15, 2002, at paragraph 52.

289 Director's Submission, dated November 15, 2002, at paragraph 60.

290 Director's Submission, dated November 15, 2002, at paragraph 58.

291 Director's Submission, dated November 15, 2002, at paragraph 59.

292 Director's Record, Tab 3, Application No. 008-10339, Review of Key Decisions and Outcomes, at page 20.

expanded the ambient air monitoring program in June 2001, with three additional monitoring sites for particulates and heavy metals.[293]

2. Analysis

[213] The Board finds that the ambient air quality monitoring program as expanded in June 2001, represents one of the most intensive particulate monitoring programs in the province. The fixed air monitoring stations, augmented by the Mobile Air Monitoring Laboratory, should provide a good basis for comparing ambient air quality levels before and after the fuel switch. The ambient air quality program, in conjunction with wind speed and direction monitoring, should provide an excellent opportunity to enhance the residents' understanding of the contribution of various dust emission sources, and to understand the air quality, especially the quantification of dust levels they are experiencing. The Board concludes that, although it is always helpful to have more data, the baseline data available to the Director was adequate. The Board will, however, recommend that the ambient air quality monitoring data be shared openly in the community liaison initiative, in a manner such that the residents can understand the information.

K. Emission Monitoring

1. Hearing Submissions

[214] EFONES argued that the Director should have looked at past compliance before issuing the Approval. EFONES submitted that the Approval Holder failed to comply with the terms and conditions of its previous approval including: twice yearly measurements of particulates from the ESP and clinker cooler stacks which were not done in 1998 and 1999; exceedance of approval limits for particulates from the clinker cooler stack; that late filing of an air monitoring program; and exceedances in the levels of $PM_{2.5}$.[294]

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293 Director's Record, Tab 3, Application No. 008-10339, Review of Key Decisions and Outcomes, at page 21.

294 EFONES' Submission, dated November 15, 2002, Affidavit of Ms. Verona Goodwin, dated November 14, 2002, at paragraph 31. According to EFONES, under the existing approval, the Approval Holder was required to submit a monitoring plan to the Director by February 1998. The Approval Holder did not submit its first results until June 2001, 14 months after being instructed to implement the plan, and the results showed many incidences where the Approval Holder had exceeded accepted $PM_{2.5}$ levels.

[215] EFONES argued that measuring opacity levels in the stack is inadequate as it does not "…quantify the volume nor analyze the chemical composition of the toxins released to the atmosphere and distributed over the city and adjacent communities."[295] The EFCL added that analysis "…of the particulate emissions in the stack are possible and should be done."[296]

[216] EFONES concluded by stating that they would like the Approval set aside, and if the Approval Holder wished to continue with the conversion to coal, the Director should include a number of conditions, including that for every single exceedance of emission limits, the Approval Holder should be shut down for one week or it should post a $10,000.00 security deposit to the Alberta Lung Association and the Alberta Heart Foundation.[297]

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[295] EFONES' Submission, dated November 15, 2002, Affidavit of Mr. Stan Kondratiuk, dated November 11, 2002, at page 3.

[296] EFCL's Submission, dated November 15, 2002, Report of Mr. Edo Nyland, at page 4.

[297] EFONES' Submission, dated November 15, 2002, at paragraph 91. The Appellants requested the following relief:

> "The Appellants ask that the Board set aside the Approval and provide the Director with the following directions if Inland wishes to continue with the conversion to coal:
>
> a) that the Director make it a condition of the Approval that Inland develop and implement a plan to reduce its total PM, $PM_{2.5}$ and PM_{10} emissions such that the ambient levels of PM do not exceed the Guidelines;
>
> b) that the Director make it a condition of the Approval that a maximum limit for the next three years of 40, 30 and 20% of the front half particulate catch be imposed for the back-half particulate catch to ensure that he fine particulate fraction releases are continuously reduced from the kiln stack emissions;
>
> c) that the Director make it a condition of the Approval that a maximum total stack emission limit of total mass of particulate over a 24-hour period, regardless of production levels, be imposed to not exceed a total release of 20 kg … ;
>
> d) that the Director require Inland to develop and implement a plan to reduce emissions of mercury, heavy metals and PAHs and to continue to modify the plan until reductions are apparent;
>
> e) that the Director place strict limits on the use of waste materials containing heavy metals such as waste iron ore, bottom ash, tires and used oils and grease. … ;
>
> f) that the Director place limits on emissions of iron from the fugitive sources and stacks. These limits should be <0.01% of the total particulate and 0.001% of the fine particulate by weight. …;
>
> g) that the Director require that chromium input be limited to <10 PPM and to restrict the CrVI content in cement bags by requiring Inland to add ferrous sulfate to their product;
>
> h) that the Director require Inland install BADT;
>
> i) that Inland conduct a human health assessment as well as an epidemiological study of human lung and cardiovascular disease endpoints in relation to particulate matter emissions prior to the conversion to coal;

[217] By contrast, the Approval Holder submitted that the monitoring requirements in the Approval are "…thorough and proper given the circumstances."[298] The Approval Holder referred to the provisions in the Approval,[299] included its proposed air monitoring program, and stated that the "additional monitoring station" will be located in an area where the maximum off-site particulate matter concentrations may occur.[300]

[218] The Approval Holder indicated that:

> j) that the Director require a re-evaluation of the health and environmental impacts of adding wastes such as iron ore, bottom ash, tires and waste oils to the cement clinker;
>
> k) that the Director make it a condition of the approval that Inland mitigate any human health problems that are found in the human health assessment;
>
> l) that after the conversion to coal; the Director require; and
>
> a) Inland to monitor both source and ambient emissions of SO2, mercury, heavy metals, PAHs and PM to ensure that the emissions are not exceeding the Guidelines or conditions of the revised Approval;
>
> b) That the ambient monitoring measure the peak levels of emissions and short term exceedances along with average levels of emissions;
>
> c) That Inland continue monitoring the ambient air quality for the life of the Plant;
>
> m) that the Director require that the Plant be shut down for at least 1 week or post a $10,000.00 security deposit to the Alberta Lung Association and the Alberta Heart Foundation for every single exceedance, including opacity meter exceedances, of the licence agreement."

The Board notes that it is uncertain what the effect would be of place a "security deposit" with either of the Alberta Lung Association or the Alberta Heart Foundation. However, this does not matter for the purpose of the Board's analysis.

298 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 16.

299 The Approval Holder referenced the following provisions:

> "(a) Lehigh Inland is required to submit an 'Ambient Air Monitoring Program' to address the monitoring of PM and other parameters (3.2.7 and 3.2.8);
>
> (b) the coal mill stack is to be equipped with a continuous emissions monitoring system ('CEMS') to allow for continuous measurement and monitoring of a number of parameters (3.2.5);
>
> (c) the Kiln stack is to be equipped with a CEMS to allow for continuous measurement and monitoring of a number of parameters (3.2.6);
>
> (d) prior to burning coal, Lehigh Inland is to install a permanent ambient air monitoring station (3.2.10);
>
> (e) the coal mill baghouse is to be equipped with broken bag detectors or leak detectors (4.1.20);
>
> (f) in general, Lehigh Inland is required to conduct extensive monitoring of emissions as described in table 4.1-F of the Approval."

300 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 13 to 15.

> "Emissions of trace metals were based on data collected on June 11 and 12, 2001. These stack tests were conducted in combination with measurements of the trace metals in the feed materials and the trace metals collected in the ESP dust to allow the development of a facility mass balance showing the fraction of compounds retained in the process as well as the fraction that escapes to the atmosphere"[301]

[219] According to the Director, the limits set in the Approval are consistent with the new emission limits and with similar facilities under similar circumstances, and takes into consideration public concern regarding additional monitoring.[302] The Director pointed out additional monitoring was required for the Kiln Stack as well as for the coal mill stack.

[220] The Director, in the "Review of Key Decisions and Outcomes" indicates that, although "…opacity is not a direct measure of particulate matter, opacity is a key parameter in assessing the performance of the pollution abatement equipment required for particulate collection. The data from the in-stack opacity monitor is also used by plant operators to adjust process conditions to ensure that the performance of the ESP is optimized."[303]

2. Analysis

[221] The majority of the emissions monitoring concerns expressed by the Appellants were related to the accuracy of the emissions monitoring and reporting undertaken by the Approval Holder to date. As set out elsewhere in this report, the Board has also expressed concern with the portrayal and assessment of ESP efficiency as this relates to the opacity readings greater than 20 percent for more than six minutes where these situations have occurred as a result of an ESP trip. As the Board found, the efficiency or performance of the ESP in removing particulate matter has been sub-optimal in circumstances additional to those involving ESP trips. The Board expresses its concern regarding the number of "incidents" that were unreported, notwithstanding that they appeared to meet the criteria necessary for reporting.

[222] At least some of the frustration expressed by the Appellants on the issue of emission monitoring also stems from the apparent lack of accurate data or information on *actual* emissions of, for example, the various components of particulate matter (TSP, PM_{10} and $PM_{2.5}$),

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301 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 11

302 See: Director's Submission, dated November 15, 2002, at paragraph 63.

303 Director's Record, Tab 3, Application No. 008-10339, Review of Key Decisions and Outcomes.

being emitted from the Kiln Stack. As the Board has set out earlier in this report, the Board heard widely varying estimates of the percentage of fine particulate matter in the Kiln Stack effluent.[304]

[223] The Approval requires, in Clause 3.2.6, that the Kiln Stack be equipped with a Continuous Emissions Monitoring System (a "CEMS") to allow for the continuous measurement and monitoring of in-stack opacity, nitrogen oxides, sulphur dioxide, and stack temperature and flow rate. The Board notes that while a CEMS for in-stack opacity provides important information in assessing the performance of pollution abatement equipment, it is not a direct measure of particulate matter.[305] The most accurate measure of emissions are manual stack surveys, which are usually done in sets of three and require several hours to complete. In order to generate acceptable data, the rigid *Alberta Stack Sampling Code* must be followed.[306] It is the manual stack surveys that are then used to "calibrate" the CEMS, which are then able to provide an ongoing record of the monitored emissions.

[224] The Board has reviewed the average hourly particulate emission rate for the Kiln Stack as reported in the Approval Holder's annual monitoring reports – which is based on the twice yearly manual stack surveys.[307] The Board notes that these manual stack surveys show a wide variation in emission rates (from 2.5 to 7.7 kg/h) which the Board finds somewhat surprising in that cement kilns are generally thought to be stable processes and with the control device functioning well, the variations would not be expected to be that great.[308]

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304 Estimates varied from less than 5 percent to as high as 70 percent.

305 The Director in setting out his "review of key decisions and outcomes" for this Approval indicated that, "…[a]lthough opacity is not a direct measure of particulate matter, opacity is a key parameter in assessing the performance of the pollution abatement equipment required for particulate collection. The data from the in-stack opacity monitor is also used by plant operators to adjust process conditions to ensure that the performance of the ESP is optimized." Director's Record, Tab 3, Application No. 008-10339, Review of Key Decisions and Outcomes, at page 16.

306 See: Approval No. 10339-01-03, Approval Clause 2.3.1(a)(i).

307 These annual reports are submitted to Alberta Environment, and were provided to the Board in conjunction with the monthly monitoring and incident reports, as a result of the document production motion brought by the EFCL.

308 For example, the 2000 Annual Summary and Evaluation Report, dated March 23, 2001, at Table 3: 2000 D Stack Particulate Emissions, shows a rate of 2.5 kg/hr for the first six months, and 7.7 for the last six months. Similarly, the 2001 Annual Summary and Evaluation Report, Table 3: 2001 D Stack Particulate Emissions, shows a rate of 7.0 for the first six months, and 5.5 for the last six months. These rates basically just reflect four individual surveys that were then extrapolated for the six month period, but the variation in particulate emission rates from 2.5 to 7.7 kg/h is still quite significant. Another way of looking at the data variation is through the stack survey results for the D stack that were reported as: 0.019 g/kg. on Oct. 12, 2000; 0.006 g/kg on May 12, 2000; 0.051 g/kg on Nov. 13, 1999; 0.026 g/kg on Nov. 7, 1999; 0.008 on Oct. 14, 1998; and 0.027 g/kg on Apr. 21, 1999.

[225] The Board acknowledges the Appellants' concerns with the CEMS for monitoring particulate emissions, and recognizes that manual stack monitoring is more accurate. As the Board has set out earlier in this report, the Board is recommending that a baghouse be installed to replace the existing ESP at the Approval Holder's Edmonton cement plant. When this baghouse is operational, the Board expects that many of the issues associated with the past particulate emissions related to the Approval Holder's ESP on its Kiln Stack will be addressed.

[226] The Board is satisfied that the Director has set forth appropriate monitoring requirements in the Approval. The Board will recommend, therefore, that these aspects of the Approval remain unchanged.

[227] Finally, with respect to the suggestion by the EFONES that "…for every single exceedance of emission limits, the Approval Holder should be shut down for one week or it should post a $10,000.00 security deposit to the Alberta Lung Association and the Alberta Heart Foundation…",[309] the Board specifically rejects this suggestion. As the Board has previously stated, the incorporation of such conditions into an approval are inconsistent with the provision of EPEA.[310]

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309 EFONES' Submission, dated November 15, 2002, at paragraph 91.

310 As the Board stated in *Bailey et al. #2* v. *Director, Northern East Slopes Region, Environmental Service, Alberta Environment*, re: *TransAlta Utilities* (May 18, 2001), Appeal Nos. 00-074, 077, 078, and 01-001-005-R (A.E.A.B.) at paragraph 106 and 107:

> "The Appellants have also asked the Board to amend the Approval to incorporate penalties and sanctions, for failure to mitigate the impacts on the Lake, directly into the Approval. The Board is of the view that this is not consistent with the provisions of the Act. The Act is designed with what is called a 'tool box' of enforcement options. The 'tool box' permits the Director to respond appropriately to a wide range of situations where enforcement or mitigation is required. The "tool box" offers a fact specific response from Alberta Environment and even from the Crown Prosecutor if necessary. We do not want to fetter that discretion.
>
> Further, one of the key elements of enforcement or mitigation action that can take place under the Act is the ability to appeal the enforcement or mitigation action to the Board. If the Board were to incorporate penalties and sanctions directly into the Approval, it would be taking away from the flexibility of the Director to respond to situations as they arise. It would be taking away the statutory right of TransAlta to appeal that enforcement or mitigation action based on a fact specific case. Again, the Board is not prepared to recommend the type of change requested by the Appellants."

L. Appropriateness and Validity of Modeling Methods and Results

1. Hearing Submissions

[228] EFONES submitted that the Director did not obtain data on current emission levels "…to verify the accuracy of the predicted levels and to determine the baseline level of emissions. Instead, he relied on predicted levels."[311]

[229] The Approval Holder stated that it had used the CALPUFF dispersion model, and prior to using the model, it had discussions with the Director to "…gain agreement on the modeling methodology and approach to be used."[312] It further stated there was no evidence that the modeling methods and results were "…anything other than appropriate and valid."[313]

[230] According to the Approval Holder, the modeling assumed NO_x emissions for the Substitution Fuel Project would be the same as when using natural gas, but according to Inland, this is a conservative assumption because "…NO_x emissions are likely to be considerably lower when using coal as fuel."[314] It also stated that "…a 15% diversion resulted in lower ground-level SO_2 and NO_x concentrations and slightly higher ground-level particulate concentrations than a 50% diversion."[315]

[231] The Director stated the air dispersion modeling completed by the Approval Holder using the CALPUFF program was consistent with Alberta Environment guidelines. The Director's staff confirmed all emission sources, including point, area, and background sources, were included in the modeling, and additional scenarios were run to include various fuels and emitted substances. The Director had also asked the Approval Holder to re-run the modeling to take into consideration the flue gas diversion was changed from 50 percent to 15 percent and the

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311 EFONES' Submission, dated November 15, 2002, at paragraph 70.

312 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 18.

313 See: Approval Holder's Submission, dated November 15, 2002, at paragraph 19.

314 See: Approval Holder's Submission, dated November 15, 2002, Affidavit of Mr. Martin A. Rawlings, at paragraph 9.

315 See: Approval Holder's Submission, dated November 15, 2002, Affidavit of Mr. Martin A. Rawlings, at paragraph 11.

coal mill stack temperature was reduced from 200°C to 100°C, and the predictions did not change significantly.[316]

2. Analysis

[232] The Board finds, notwithstanding the concerns expressed by the Appellants that the Approval Holder's modeling relied on predicted as opposed to actual emission levels, that the air quality modeling and risk assessment may be characterized as *generally* conservative. In particular, emission levels were taken from five year maximum values. Likewise, comparisons with air quality criteria were presented in an open and forthright manner. Having said this, the Board points out that the risk assessment undertaken by the Approval Holder did not address the light-industrial region immediately downwind of the Approval Holder's Edmonton facility.[317]

[233] During the hearing, the Board also discussed with the Approval Holder the inclusion of community consultation in the risk assessment to be undertaken after coal conversion.[318] Specifically, the Board asked the Approval Holder:[319]

> "Dr.. Hrudey: …Would there be any benefit in a set of circumstances like this to include the people who think their health is being affected in the problem formulation stage?
>
> Dr. Brown: Well, yes. Certainly public consultation is part of the process. It has been part and parcel of the process. In this particular case, I got involved very late in the process. This project had been going on for a couple of years and it was at a situation where I was sort of required to get up to speed very quickly and come up with estimates of risk based on available data, and so I worked very closely with Lehigh Inland, with Golder Associates, and used standard risk assessment methodology which involved hypothetical receptors and exposure limits that are set, none to be protective of health including sensitive individuals in the assessment.
>
> Dr. Hrudey: So could I take it from that answer that given more time, say some future evaluation of health effects, your preference would be to involve the public in the problem formulation stage so that you were satisfied that your health risk assessment would address their concerns?
>
> Dr. Brown: That's true."

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316 See: Director's Submission, dated November 15, 2002, at paragraphs 64 to 68.

317 See: Transcript, dated December 17, 2002, at pages 343 to 347.

318 See: Transcript, dated December 17, 2002, at page 343, lines 33 and 34, and page 344, lines 1 to 23.

319 Transcript, dated December 17, 2002, at page 343, lines 33 and 34, and page 344, lines 1 to 23.

The Board, therefore, also recommends that the risk assessment to be undertaken after the coal conversion, and as specified in the Approval,[320] include community consultation in the manner discussed during the hearing.

[234] In summary, taking into account the inclusion of community consultation in the risk assessment to be undertaken after the conversion to coal, the Board finds the modeling methods and results required by the Director and undertaken by the Approval Holder to be *largely* appropriate and valid.

M. Requirements in the Approval Instead of in the Application

1. Hearing Submissions

[235] EFONES submitted that requiring information gathering as part of the Approval does not make the application complete. EFONES argued that the application should be complete before the public notice advising of the application and requesting statements of concern is advertised to enable citizens to raise their concerns based on a completed application. EFONES believes that only if all of the information is available can citizens assess whether they have concerns and then properly state the nature of their concerns.[321]

[236] For example, the requirement to develop ambient monitoring plans was included as part of the Approval. EFONES argued that this information should have been included in the application, so that it would be subject to review before the Approval was issued, thereby giving the public an opportunity to critique the plan. The particular items of concern raised by the Appellants in their Notices of Appeal, and accepted as issues to be included in these appeals were: the ambient air monitoring plans, the coke trial burn, the fugitive emissions reduction plan, the use of landfill gas, and information regarding the type and source of coal.

[237] The Approval Holder stated that it has already submitted an Ambient Air Monitoring Plan and a Fugitive Dust Mitigation Plan to the Director.[322] As a result of hiring Dr. Brown to complete a Human Health Risk Assessment, the Approval Holder recommended one of

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320 See: Approval No. 10339-01-03, Approval Clauses 4.1.51 to 4.1.54.

321 EFONES' Submission, dated November 15, 2002, at paragraph 60.

322 See: Approval Holder's Submission, dated November 15, 2002, at Tabs 6 and 7.

the monitoring stations be located in an area where the maximum offsite particulate matter concentrations may occur.[323]

[238] In regard to the trial burn of petroleum coke as fuel, the Approval Holder stated that it had evaluated this fuel source in the air quality assessment, and therefore, "…it is entirely reasonable that this would be evaluated through a trial burn as opposed to requiring … Inland to obtain a further amendment to the Approval."[324]

[239] The Approval Holder stated that it was still looking into the environmental and technical issues associated with using landfill gas as a fuel source. It submitted that if "…the Approval were to include a condition requiring the use of landfill gas, … Inland would be placed in an untenable negotiating position with the owner and operator of the adjacent landfill."[325] Therefore, according to the Approval Holder, the provisions in the Approval regarding the use of landfill gas are appropriate.

[240] With respect to the issue of the type and source of coal, the Approval Holder stated that "…regardless of the type of coal used, … Inland must nevertheless meet the air emission limits specified in the Approval."[326]

[241] The Director submitted that the requirement for Inland to implement an ambient monitoring program was in response to the Statements of Concern and public comments regarding additional monitoring. The monitoring would provide additional information to supplement the data collected by Alberta Environment, and the data would also provide an indication of whether the Substitution Fuel Project affected ambient air quality.[327] The Director did not see "…any compelling reason to have Inland's ambient monitoring plan in hand before issuing the Approval."[328]

[242] The Director argued the level of information available regarding the use of petroleum coke as a fuel source and the existing emission limits are adequate to have the

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323 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 21, 22, and 25.

324 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 24.

325 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 27.

326 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 29.

327 See: Director's Submission, dated November 15, 2002, at paragraph 71.

328 Director's Submission, dated November 15, 2002, at paragraph 72.

Approval Holder obtain written authorization prior to conducting a trial burn instead of requiring a further amendment to the Approval.[329]

[243] The Director stated that the Approval Holder is required to submit a proposal for a fugitive emission reduction plan and implement the program prior to burning coal. Given the conditions in the Approval regarding controlling fugitive emissions, the Director did not see "…any compelling reason to have Inland's fugitive emission reduction plan in hand before making his decision on the application."

[244] The Director submitted that requiring written approval prior to the Approval Holder using landfill gas as a fuel source will shorten any further approval process or will preclude the requirement for an amendment to the Approval.

[245] With respect to the issue of the coal source, the Director stated that "…Alberta sub-bituminous and bituminous coals are typically low in sulphur content and concentrations of trace elements." As a result, the Director requires the Approval Holder to obtain written authorization prior to the use of non-Alberta sources of coal, and all emission levels must be met regardless of the fuel used.[330]

2. Analysis

[246] The concern that the Appellants have expressed with respect to this issue is that they would like to have seen more information included in the application prior to it being advertised and the public being requested to provide statements of concern in response. The Board certainly accepts the broad principle that the more information that is available regarding a proposed project the better. However, when it comes to the task facing the Director – whether to issue an approval or not – the Board recognizes that the Director must take a measured approach and that in some cases it may be appropriate to collect information pursuant to the Approval. With respect to the five issues specific items identified by the Appellants as being a concern, the Board is of the view that the Director's approach was reasonable.

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329 Director's Submission, dated November 15, 2002, at paragraph 74.

330 See: Director's Submission, dated November 15, 2002, at paragraphs 82 and 84.

[247] With respect to the ambient air monitoring plans, the Board notes that the Director indicated that the requirement for the Approval Holder to implement an ambient monitoring program was in response to the Statements of Concern and public comments regarding additional monitoring. The Board accepts this as a reasonable basis, in this case, as to why the development of the ambient air monitoring plans was included as part of the Approval. Further, the Board notes that the Approval Holder has already submitted its Ambient Air Monitor Plan and that it was included in its submission to the Board.[331] As a result, the Board is satisfied that the Appellants have had the opportunity to raise any concerns that they may have regarding this plan. As the Director has noted previously, one of the purposes of the Statement of Concern process and this appeal process is to "build a better approval."

[248] With respect to the petroleum coke trial burn, it makes sense to the Board that the best information would come from conducting a trial burn after the modifications to the Plant are completed. As a result, in this case, including the trial burn as part of the Approval seems reasonable.

[249] With respect to the Director's decision to allow the Approval Holder to submit its fugitive emission reduction plan prior to commencing burning coal, but after issuing the Approval,[332] the Board again notes that the Approval Holder has already submitted its fugitive dust mitigation plan.[333] Again, as such, the Appellants have also had an opportunity to provide their comments to the Board in response to this plan. The Director also pointed out in his direct evidence that the submission of this plan was, in addition to the other conditions in the Approval, "…requires the largest source of fugitive emissions [(outdoor storage of clinker)] to be eliminated prior to commencing the burning of coal…."[334] The Board understands that, in fact, at least some of the concerns associated with "dusting" incidents in adjacent communities have been related to existing fugitive emissions, most notably the outdoor clinker storage.[335] The

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331 Approval Holder's Submission, dated November 15, 2002, Tab 6.

332 Approval Holder's Submission, dated November 15, 2002, Tab 1, Approval No. 10339-01-03, at pages 9 and 10, clauses 3.2.20 through 3.2.25.

333 Approval Holder's Submission, dated November 15, 2002, at Tab 7. The Board notes that, according to the Approval, clause 3.2.20, the Approval Holder was required to submit this plan to the Director by August 1, 2002, unless otherwise authorized in writing by the Director.

334 Transcript, dated December 18, 2002, at page 416, lines 19 to 28.

335 Transcript, dated December 18, 2002, at page 429, lines 16 to 35, and page 424, lines 11 to 10. Ms. Sartori,

Board views the approach taken by the Director to address the problems associated with the past performance of the Approval Holder's plant in dealing with fugitive dust,[336] and the new requirements set out in the Approval to store clinker inside and to require the submission of a fugitive emission control plan prior to beginning to burn coal, as *commendable.* The Board anticipates that these new requirements will solve many of the on-going problems associated with these fugitive dust emissions.

[250] With respect to the use of landfill gas, the Board notes the concerns expressed by the Approval Holder that there are environmental and technical issues associated with this proposal and that the landfill is controlled by another party. Given these facts, the Board is of the view that trying to fully address this issue in the application process would be impractical and that the approach taken by the Director was appropriate.

[251] Finally, with respect to the issue of they type and source of coal, the Board accepts the comments of the Director that Alberta coals "…are typically low in sulphur content and concentrations of trace elements." The Board is of the view that as long as Alberta coals are being used, no more information would be required, and that the Director's approach is reasonable.

[252] As a result, with respect the question of the appropriateness of including the five items identified as concerns by the Appellants as requirements of the Approval as opposed to making them requirements of the application process, the Board is of the view that, in this case,

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for the Director, stated:

> "Based on our review of Lehigh's application, site visits to three other cement plants and concerns expressed by members of the public and adjacent businesses, we concluded that Lehigh should implement a plan to reduce site fugitive emissions. … Based on our review of Lehigh's application, the outdoor storage of clinker appeared to be the largest source of fugitive emissions. … The approval also requires Lehigh to address other fugitive emissions associated with the storage and handling of raw material, the paved roadways and unpaved and ungrassed areas of the plant."

336 Transcript, dated December 18, 2002, at page 414, lines 23 to 32. The Director stated:

> "The past performance of the plant did play a role in the review process. For example, existing issues such as the main stack, electrostatic precipitator downtime or trips were considered in our review. Also we considered the issue of existing fugitive; that is, wind-blown dust emissions from the site. With respect to the application review process, Lehigh Inland Cement was required to include a summary of past environmental performance in its application and that information was reviewed."

the Director's decision was reasonable. As a result, the Board will recommend that these portions of the Approval be confirmed.

N. Control of Greenhouse Gas Emissions

1. Hearing Submissions

[253] According to EFONES, the emission levels of greenhouse gases will increase by 16 percent. They argued this was unjustifiable in light of the Kyoto Protocol, and companies should be reducing, not increasing, greenhouse gases.[337]

[254] The Approval Holder argued that it has been a "…proactive corporate citizen" in respect to controlling greenhouse gasses.[338] In looking at the cement industry as a whole, the Approval Holder stated that the

> "…total CO_2 emission based on a natural gas fired kiln is 0.725 t CO_2/t clinker, based on a coal fired kiln it is 0.868 t CO_2/t clinker and based on a petcoke [(petroleum coke)] fired kiln it is 0.883 t CO_2/t clinker. The fuel switch from natural gas to coal or petcoke [(petroleum coke)] therefore leads to an increase of total CO_2 emissions at this cement kiln of 19.7 respectively 21.9%."[339]

[255] The Director agreed that the Substitution Fuel Project will result in an increase in the amount of greenhouse gas emissions. However, the Director submitted that it was "…premature to address management of greenhouse gases in the Approval beyond setting requirements for greenhouse gas emissions reporting."[340] The Director further stated that in the Government plan, *Albertans & Climate Change: Taking Action*, sectoral agreements have been retained, and therefore, the Director's approach to the issue in the Approval remains valid.[341]

2. Analysis

[256] The Board notes the concerns that the Appellants have expressed about the effect of the Substitution Fuel Project on greenhouse gas emissions. However, at this time, the Board

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337 EFONES' Submission, dated November 15, 2002, Affidavit of Mr. Cameron Wakefield, at paragraph 12.

338 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 52.

339 See: Approval Holder's Submission, dated November 15, 2002, Tab 5, Technical Report – Substitution Fuel Project in the Edmonton Plant of Lehigh Inland Cement Limited, at page 9.

340 Director's Submission, dated November 15, 2002, at paragraph 116.

is prepared to accept the argument of the Director that it is "…premature to address management of greenhouse gases in the Approval beyond setting requirements for greenhouse gas emissions reporting."[342]

O. Use of Tires as Kiln Fuel

1. Hearing Submissions

[257] Mr. Hayes stated that the Approval Holder should not be allowed to burn tires, as the combined effects of burning tires with coke and coal are unknown.

[258] The Approval Holder stated that tires are commonly used as a fuel source in the cement industry without significant impacts on emissions.[343]

[259] The Director submitted that the amended clauses regarding the use of tires as kiln fuel improves the Director's scrutiny over the Approval Holder's use of tires. The Director further stated that "…if Inland is able to meet the enhanced limits in the Approval, the Director would not likely withhold the written authorization required by clause 4.1.17."[344]

2. Analysis

[260] The Board included the use tires as kiln fuel limited to condition 4.1.17 as an issue in this appeal because, unlike the other clauses in the Approval dealing with tires that were merely carried forward from the previous approval, the substance of the wording of this provision was changed. As stated in the our Preliminary Issues Decision:[345]

> "…the Board is of the view that the wording of condition 4.1.17 has been changed in substance. In the amended Approval, condition 4.1.17 states:

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341 Director's Submission, dated November 15, 2002, at paragraph 117.

342 Director's Submission, dated November 15, 2002, at paragraph 116.

343 See: Approval Holder's Submission, dated November 15, 2002, at paragraphs 53.

344 Director's Submission, dated November 15, 2002, at paragraph 119.

345 See: Preliminary Issues: *Doull et al.* v. *Director, Northern Region, Regional Services, Alberta Environment*, re: *Inland Cement Limited* (11 October 2002), Appeal Nos. 02-018-041, 047, 060, 061, 073, and 074-ID1 (A.E.A.B.).

> '4.1.17 Prior to commencing the use of tires as a kiln fuel, the approval holder shall obtain a written authorization from the Director.'
>
> In the original version of the Approval, the Approval Holder did not require written authorization prior to burning tires, only that it '…notify the Director that tires will be used as fuel at least one day prior to the commencement of use of tires as fuel.'"[346]

[261] While the Board appreciates the concerns raised by the Appellants regarding the use of tires as a fuel source, and it was certainly clear that the Appellants did not want tires to be used as a fuel source, the fact remains that the provisions that authorized the use of tires were included in the previous approval and are therefore not before the Board for consideration. Unfortunately, no arguments were presented to the Board as to how the trigger mechanism created in condition 4.1.17 should be amended. The other option that is available to the Board is to recommend that the provision be deleted. Doing this, however, would simply delete the triggering mechanism and would allow the Approval Holder to use tires as a fuel source without either notifying the Director or obtaining his approval. Deleting the provision is therefore certainly inconsistent with the concerns raised by the Appellants and not an appropriate recommendation.

[262] Thus, the Board is of the view that requiring the Director's approval prior to commencing the use of tires as a fuel source is a reasonable requirement, and certainly is an improvement over the previous mechanism, which simply require that the Director be notified. The Board will therefore recommend that this provision of the Approval be confirmed.

P. Public Consultation

1. Hearing Submissions

[263] In their submission, EFONES raised a number of concerns regarding the process that the Director undertook. EFONES argued that at the time the advertisement regarding the notice of application was published, the application was not complete because there was

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[346] See: Preliminary Issues: *Doull et al.* v. *Director, Northern Region, Regional Services, Alberta Environment*, re: *Inland Cement Limited* (11 October 2002), Appeal Nos. 02-018-041, 047, 060, 061, 073, and 074-ID1 (A.E.A.B.), at paragraph 88. See also: Director's Record, Tab 1, Approval No. 10339-01-03, condition 4.1.17. See also: original Approval (Approval No. 10339-01-00), condition 4.1.27.

additional information that was filed after the publication of the public notice. EFONES stated that the Director is required to have the public notice published "…once the application is *complete*."[347] (Emphasis in the original.)

[264] EFONES further argued:

> "The information provided after the notification indicates that the emissions are substantially greater than what was predicted in the Application and other predictions were unreliable. It is difficult to determine if more members of the public would have submitted Statements of Concern if they had all the information but it is safe to assume they may have. Furthermore, the current Appellants would have put forth different concerns and comments."[348]

They concluded by stating that the process "…lacks in transparency, partnering, 'doing no harm' and 'respect for personal autonomy'."

[265] The EFCL expressed their disappointment that an EIA was not required prior to the issuance of the Approval and no representatives from Alberta Environment had visited the affected areas to hear from the residents. EFCL argued that the "…Director failed to give due consideration to the views of the residents of the City of Edmonton, first in deciding that no EIA was necessary, and second, in deciding to approve the application."[349] The EFCL argued that without the benefit of an EIA, the Director's decision to grant the approval was "…improper and void *ab initio*."[350]

[266] The EFCL explained that a petition had been circulated in the area of the Approval Holder, and over 3,000 individuals signed the petition. However, the Director accepted the petition, along with a separate Statement of Concern from one individual, as only

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347 EFONES' Submission, dated November 15, 2002, at paragraph 51.

348 EFONES' Submission, dated November 15, 2002, at paragraph 63. See also: EFONES' Submission, dated November 15, 2002, Affidavit of Dr. Colin Soskolne, at page 3.

349 See: EFCL's Submission, dated November 15, 2002, at paragraph 14. In its previous decision, the Board determined that it "… does not have jurisdiction to hear appeals with respect to the decisions made regarding whether an environmental impact assessment should or should not be done prior to the issuance of an approval." Preliminary issues: *Doull et al*. v. *Director, Northern Region, Regional Services, Alberta Environment* re: *Inland Cement Limited* (11 October 2002) Appeal Nos. 02-018-041, 047, 060, 061, 073, and 074-ID1 (A.E.A.B.) at paragraph 90.

350 See: EFCL's Submission, dated November 15, 2002, at paragraph 20.

one Statement of Concern.[351] The EFCL also stated that they were not aware of the Director coming out to the communities to speak with the residents directly about their concerns.[352]

[267] The EFCL explained that they had conducted a survey of residents in the adjacent communities. According to the EFCL, the results of the survey indicate that the residents feel the current emission levels are affecting their health and property. The EFCL continued:

> "Similarly, the survey also shows the high level of trepidation residents possess regarding future emissions. While residents are opposed to the conversion to coal, the survey results consistently support the remedial measures that we proposed in our Notice of Appeal including the best available technology, notification, community liaison committee and community health study."[353]

[268] The EFCL submitted that the Director must give due consideration to the properly filed Statements of Concern and to concerns expressed by the public of which he is aware. The EFCL submitted that there was no evidence that the Director involved the public in the review process or considered the concerns expressed by the public. The EFCL also stated there has been "…little or no regard for the cumulative impacts; instead, the focus has been on the Inland Cement conversion in isolation."[354] The EFCL further stated that, at the public meeting held on May 14, 2001, representatives from Alberta Environment appeared to support Inland "…against the concerns and criticisms being voiced by residents. Inland and Alberta Environment looked to us to be on the same side."[355]

[269] A witness for the EFCL expressed concerns regarding her dealings with Alberta Environment in the past. She stated that she had contacted Alberta Environment on the "…emergency telephone line when she noticed a dark cloud extending from Inland's facility." She was informed that Inland had been contacted and it did not have a "reportable" incident and the opaqueness was within guidelines. According to this witness, Alberta Environment did not investigate on its own and accepted the word of Inland. This witness also stated that on another occasion, after calling Alberta Environment about black emissions coming from the stack at Inland on two sequential days, she was rudely given the same explanation and was told to stop

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351 EFCL's Submission, dated November 15, 2002, Statement of Ms. Bonnie Quinn, at page 6.

352 EFCL's Submission, dated November 15, 2002, Statement of Ms. Bonnie Quinn, at page 6.

353 EFCL's Submission, dated November 15, 2002, at page 10.

354 EFCL's Submission, dated November 15, 2002, at pages 7 to 8.

355 EFCL's Submission, dated November 15, 2002, Statement of Ms. Bonnie Quinn, at page 3.

calling.[356] She submitted there was no point in calling the emergency line if Alberta Environment was not willing to independently investigate the complaints.[357]

2. Analysis

[270] The Board is disappointed with the public consultation efforts of the Director in this case. It is clear that the Director recognized that this was a very significant application, with a great deal of public concern. He also recognized that Inland has a poor track record when it came to controlling their emissions. He stated:

> "The first item was that concerns from the local community were anticipated with respect to the project due to the close proximity of residents and businesses to the Inland facility. Secondly, given that Inland had experienced some difficulties in the past in controlling emissions from their site, we needed to have additional assurance that the proposed fuel substitution project would not further contribute to these types of incidents."[358]

[271] Further, the Director also recognized the significance of this application when he provided for 45 days to file statements of concern, instead of the usual 30. (Interestingly enough, in *Bailey,*[359], Director Ostertag also provided 45 days for statements of concern to be filed. The Director in this case obviously had the same type of concerns that faced Director Ostertag.) At the hearing, the Director discussed that he made the rare decision to refer the matter to the Environmental Assessment Director and that he was subsequently surprised that an EIA was not required. He stated there "…were some surprises in terms of its rare that I would put forward an item that is a non-mandatory item for review, so there was some surprise on my part …[that an EIA report was not required]."[360]

[272] Given these facts, the Board is surprised that he did not provide for greater public input. Comparing this matter with *Bailey*, where Director Ostertag did such a good job at public consultation – and with respect, the issues in this appeal affect a *much* larger number of people – the Board does not understand why the Director did not undertake greater public consultation.

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356 EFCL's Submission, dated November 15, 2002, Statement of Ms. Bonnie Quinn, at page 6.

357 EFCL's Submission, dated November 15, 2002, Statement of Ms. Bonnie Quinn, at page 6.

358 Transcript, December 18, 2002, page 410, lines 6 to 15.

359 *Bailey et al. #2* v. *Director, Northern East Slopes Region, Environmental Service, Alberta Environment*, re: *TransAlta Utilities* (May 18, 2001), Appeal Nos. 00-074, 077, 078, and 01-001-005-R (A.E.A.B.).

[273] It appears to the Board that the Director's approach to public consultation was somewhat clinical. In direct evidence, with respect to dealing with the statements of concern, the Director stated:

> "When we reviewed the statements of concern, we were able to categorize most of the concerns into broad categories. Anita Sartori and other staff prepared a chart that summarized the concerns. Some of those concerns included health, air quality, independent substantiation of information provided by Inland Cement, whether coal should be used at all and … Inland's past environmental performance. We noted that the majority of concerns were issues that we were already attempting to address. For example, we had established a health team to review any health concerns with the project, also fuels used at cement plants, pollution abatement equipment and air quality were matters that were the focus of our review."[361]

[274] In several places in the evidence, the question of what type of discussions did the Director have with the Statement of Concern filers regarding their Statements of Concern was raised and the answer was *none*. In the closing arguments, the EFCL aptly summarized the type of public consultation that the Director undertook – the Director did the bare minimum prescribed by the Act.[362] We find that in a case that is this significant – a cement plant major urban area - the bare minimum is not enough. The response from the Director on this point is that he followed that Act and that is all they are required to do and that is all that their resources allow them to do.

[275] In our previous discussions regarding Director Ostertag, the Board recognized that different applications deserved different levels of attention and resources.[363] However, if ever there was a case, where there was such a great level of public concern, this is one where

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360 Transcript, dated December 18, 2002, at page 522, lines 19 to 22.

361 Transcript, December 18, 2002, page 413, lines 3 to 18.

362 Transcript, December 18, 2002, page 576, lines 21 to 35:

> "Mr. Fitch: I have to take issue with the thing that the legislation doesn't require more. Is it the standard in Alberta that we will do the bare minimum to involve the public? Surely the public has come to expect more, that when an Act says there will be public involvement, you don't look to the legislation and say what is the bare minimum that we must do to satisfy that. I think we are in a -- hopefully we are in a progressive province that the regulators will look and say, Let's look at this situation. What, in this situation, can we do to involve the public especially when they know there is 160 statements of concern and there is people, 3,000 people, filing a petition. Clearly this involves more than the bare minimum."

363 *Bailey et al. #2* v. *Director, Northern East Slopes Region, Environmental Service, Alberta Environment*, re: *TransAlta Utilities* (May 18, 2001), Appeal Nos. 00-074, 077, 078, and 01-001-005-R (A.E.A.B.).

more resources should have been devoted. While it is not possible to speak to every person who filed a statement of concern or every person who signed the petition, certainly it was possible to identify community leaders or leaders of the opposition to this project, like the Quinns, and speak to them. Failing that, speaking directly to a random sampling of statement of concern filers would have been prudent to ensure that the Director understood the concerns.

[276] While the Director's job requires a strong technical background, it also requires that he deal with public concerns as well – he must balance these two aspects of his job. It is our judgment that he does not appear to have done this very successfully in this case, and we must therefore find that he has not complied with the purposes of the Act found in section 2, which requires public involvement in such decisions.

III. CONCLUSION

[277] Having regard to all of the evidence and submissions presented to the Board and the foregoing discussion and analysis the Board concludes:

1. Alberta Environment policies require the Director to ensure that industrial emissions of substances posing health concerns must be controlled using the best available demonstrated technology (BADT).
2. The Director did not follow Alberta Environment's own policy of requiring BADT for *this* cement kiln which discharges into an urban airshed. Rather, the Approval allowed the continued use of the existing old electrostatic precipitator (ESP), with a documented history of seriously inconsistent performance, as the main pollution control technology for fine particulate matter emissions from the Kiln.
3. There are valid potential health concerns, related to peak emission levels of fine particulates that were predicted to exceed relevant ambient air quality criteria using the existing ESP, under the conditions of the Approval. These peak emissions must be properly mitigated in order to minimize the risk to the Appellants and other residents in the area.
4. The body of evidence in support of health concerns in the population arising from exposure to fine particulates provides a credible case for minimizing population exposures to these pollutants. Furthermore, short term health effects, among sensitive individuals such as asthmatics, that may arise from peak exposures to airborne particulate matter are a concern to the Board.
5. There is no credibility in the evidence presented by the Appellants predicting that a specific number of fatalities would be caused by the

emissions from the Inland Plant. Rather, the Board is convinced that the relevant health concern is associated with the short term peak exposure conditions and the associated short term health effects they may cause.

6. The history of sub-optimal operation of the Inland ESP ranged from periodic complete shutdown (ESP trips) to periods of poor performance. Only some of these constituted events reportable to Alberta Environment. Dusting events causing nuisance conditions and potential health concerns in adjacent communities were documented from the Kiln Stack, as well as from various fugitive emissions from the Inland Plant.

7. The Director addressed the problem of fugitive emissions aggressively in the Approval, and the Board is satisfied that these measures will substantially reduce the potential for the Inland Plant to cause nuisance emissions in the future.

8. Likewise, the Director sought to deal with the excessive peak emissions of particulates from the Kiln Stack by severely limiting the number of ESP trips that would be allowed in the future. The Board recognizes that the ESP improvement measures, which have been implemented for the Inland ESP over the past two years, have offered substantial improvement over the unacceptable emissions of the past. However, based on the substantial evidence provided by the Approval Holder and the Director, as well as the Appellants, the specified improvements with this ESP do not constitute BADT in terms of providing consistent control of peak particulate emissions. Such emissions of a significant pollutant upwind of a large urban population makes the requirement for control by BADT compelling.

9. The Director included clause 4.1.34 in the Approval to require installation of a baghouse in the event that Inland could not control the number of ESP trips in the future. This requirement, combined with considerable evidence from the Director, the Approval Holder, and the Appellants have convinced the Board that a baghouse constitutes BADT for the Kiln Stack at Inland.

10. The existing ESP on the Kiln Stack should be replaced by a fabric filter baghouse as soon as possible. Because of the concerns about peak particulate emissions, the baghouse must be designed to operate without a bypass as was done with the Lafarge Richmond Plant that the Director visited. There may be some benefit in keeping the ESP shell as a buffering chamber upstream of the baghouse, and the merits of this option should be evaluated by the Approval Holder and reviewed by the Director.

11. The Board is prepared to accept the Director's determination that it is reasonable that the Approval Holder will require 20 months to install the baghouse. However, having said this, *in the strongest terms possible*, the Board recommends that the baghouse be installed and operational as soon as possible to limit any ongoing potential impacts on the surrounding population.

12. The number of allowable trips that should be permitted until the baghouse has been constructed and is operational should be six per calendar year. In the event the Approval Holder exceeds six trips in any calendar year before the baghouse is operational, the Approval Holder should immediately provide a report to the Director and the Director should revisit the amount of time required to install the baghouse and reduce the amount of time if possible.

13. Until the baghouse is operational, the Approval Holder should develop a local residents ESP trip notification system to the satisfaction of the Director. The ESP trip notification system should only contact those residents who request to be advised of such ESP trips.

14. The emission limits set for particulate matter do not accord with the approach required of the Director as set out in the *Industrial Release Limits Policy*. The Board believes that emission limits should be re-evaluated with a view to lowering them to reflect the level of removal performance that is consistently achievable by baghouses.

15. The use of coal as a fuel source in cement kilns, combined with the use of BADT for emission control, is an acceptable choice for the Inland Plant. This balances the various interests, as required by section 2 of the *Environmental Protection and Enhancement Act*.

16. A Local Residents Liaison Committee is appropriate and the Approval Holder should establish and fund an ongoing Local Residents Liaison Committee to the satisfaction of the Director.

17. The ambient air quality monitoring program as expanded in June 2001, represents one of the most intensive air particulate monitoring programs in the province.

18. The ambient air quality monitoring data should be shared openly with the Local Residents Liaison Committee, in a manner that will allow the local residents to understand the information.

19. With regard to the emissions monitoring issues raised by the Appellants, the Board is satisfied that the Director has set forth appropriate emission and ambient air quality monitoring requirements in the Approval.

20. The air quality modeling and associated human health risk assessment was *generally* cautious and forthright in its interpretation of the likely human health risk of emissions from the Inland Plant. The failure to consider exposures of individuals in the commercial and light industrial region to the south and east of the Inland Plant was a shortcoming. Undertaking a future human health risk assessment that makes use of the ambient air quality monitoring data from the new monitoring sites and which involves the Local Residents Liaison Committee in setting the Terms of Reference for the risk assessment will improve the meaning of the findings for local residents.

21. It would be a useful exercise for Alberta Environment, Alberta Health and Wellness, the Capital Health Authority, the Approval Holder, and the Local Residents Liaison Committee, along with other stakeholders, to discuss the possibility of a regional health study similar to studies carried out in the Fort McMurray and Wabamun Lake areas.

22. The Director was justified, for these specific circumstances, to include five issues (ambient air monitoring plans, the trial burn for coke, the fugitive emissions plan, the use of landfill gas and information regarding the type and source of coal) as requirements in the Approval instead of requiring them to be part of the application.

23. The Board notes the concerns the Appellants have expressed about the effect of the Substitution Fuel Project on greenhouse gas emissions. However, at this time, the Board is prepared to accept the argument of the Director that it is premature to address management of greenhouse gases in the Approval beyond setting requirements for greenhouse gas emissions reporting.

24. The provision in the Approval requiring the Director's approval prior to commencing the use of tires as a fuel source is a reasonable requirement, and is certainly an improvement over the previous mechanism, which simply required that the Director be notified.

25. When the baghouse on the Kiln Stack and the fugitive emission plans are fully operational, the Board expects that the past concerns regarding potential health risk and nuisance conditions that have been associated with emissions from the Inland Plant should be largely resolved.

IV. RECOMMENDATIONS

[278] In accordance with section 99 of the Act, the Board recommends that the Minister of the Environment confirm the Approval, subject to the following changes:

1. vary condition 4.1.34 by replacing it as follows: "Within 90 days of the date of the Minister's Order in Environmental Appeal Board Appeal Nos. 02-023, 024, 026, 029, 037, 047 and 074, the approval holder shall submit a detailed plan to the Director to replace the ESP with a baghouse system. The baghouse shall be designed and installed so that it operates without a bypass. Subject to condition 4.1.32, in the event the approval holder exceeds six trips in any calendar year before the baghouse is operational, the approval holder shall immediately notify the Director in writing and the Director shall revisit the amount of time required to install the baghouse and reduce the amount of time if possible."

2. vary condition 4.1.37 by replacing it as follows: "The baghouse referred to in 4.1.34 shall be installed and fully operational as soon as possible, but no later than within 20 months of the date of the Minister's Order in

Environmental Appeal Board Appeal Nos. 02-023, 024, 026, 029, 037, 047 and 074, unless authorized otherwise in writing by the Director. The Director may reduce but shall not extend the deadline by which the baghouse shall be installed and fully operational."

3. vary condition 4.1.20 by replacing it as follows: "The coal mill baghouse and kiln (D) stack baghouse shall be equipped with broken bag detectors or leak detectors, unless otherwise authorized in writing by the Director."

4. vary the Approval by replacing Table 4.1-E as follows:[364]

"Table 4.1-E: ELECTROSTATIC PRECIPITATOR (ESP) TRIP FREQUENCY LIMITS (EXCLUDING ALLOWANCE FOR COMMISSIONING)

EFFECTIVE PERIOD	TRIP FREQUENCY LIMIT
July 1, 2002 to December 31, 2002	8 trips
January 1, 2003 to December 31, 2003	6 trips
January 1, 2004 to December 31, 2004	6 trips

"

5. vary condition 4.1.10 by replacing it as follows: "The approval holder shall either recycle or sell the dust collected in the ESP, the new kiln baghouse replacing the ESP, and the clinker cooler baghouse."

6. vary condition 4.1.51 by replacing it as follows:

"On or before December 31, 2004, the approval holder shall submit to the Director a proposal to update the screening level risk assessment provided in the Human Health Assessment Report in support of Application No. 008-103339 and the Human Health Risk Assessment of the Lehigh Inland Cement Limited Substitution Fuel Project dated November 21, 2002 (as corrected) prepared by Cantox Environmental Inc. The proposal to update the assessment shall explicitly commit to making maximum use of the monitoring data to be collected according to the requirements of this approval and to developing a terms of reference for the assessment in consultation with the Local Residents Liaison Committee."

7. vary condition 4.1.53 by replacing it as follows: "Prior to December 31, 2005, the approval holder shall submit the update referred to in 4.1.52 to the Director."

8. vary condition 4.1.54 (d) by deleting the word "and" at the end of the condition.

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[364] For the purpose of clarity, the Board is not recommending any changes to condition 4.1.32, which permits additional ESP trips during the initial commissioning period.

9. vary condition 4.1.54 (e) by replacing it as follows: “a summary of community input to the design of the assessment; and”.

10. vary condition 4.1.54 by adding to the end of the condition: “(f) any other information required in writing by the Director.”

11. vary the Approval by adding immediately after condition 4.1.54 the following:

    “4.1.55 The approval holder shall develop a local residents notification system, that is to the satisfaction of the Director, that will give local residents in the neighbouring communities the option of participating in the system and being notified of any reportable incidents involving particulate emissions from the approval holder. The local residents notification system shall remain in place until the baghouse is operational.

    4.1.56 The approval holder shall develop and fund a Local Residents Liaison Committee to the satisfaction of the Director.”

[279] The Board is also of the view that:

1. The Director should review the opacity and particulate emission limits from the Kiln Stack currently specified in Table 4.1-C, with a view to lowering them to a reasonably achievable number that will accurately reflect the performance of baghouse technology at other cement kilns using baghouse control technology for the Kiln Stack emission sources and the performance guarantees that may be provided by equipment suppliers.

2. The Capital Health Authority, Alberta Health and Wellness, Alberta Environment, the Approval Holder, and the Local Residents Liaison Committee, along with other stakeholders, should review the feasibility of performing a community air quality and health survey in northwest Edmonton, building on experience of other community air quality surveys performed in recent years in Alberta, in relation to the ability of such a study to inform community residents about the role of air quality in their community as a factor in human health.

3. There may be some benefit in keeping the ESP shell as a buffering chamber upstream of the baghouse, and the merits of this option should be evaluated by the Approval Holder and reviewed with the Director.

[280] Attached for the Minister’s consideration is a draft Ministerial Order implementing these recommendations.

[281] Finally, with respect to sections 100(2) and 103 of the Act, the Board recommends that copies of this Report and Recommendations, and of any decision by the Minister, be sent to the following parties:

1. Ms. Jennifer Klimek, representing Mr. Ron and Ms. Gail Maga and Mr. Ron Maga Jr., Mr. Cameron Wakefield, Mr. A. Ted Krug, Mr. Stanley Kondratiuk, and Dr. Roger G. Hodkinson;
2. Mr. Neil Hayes;
3. Mr. Gavin Fitch, Rooney Prentice, representing Ms. Anna T. Krug;
4. Ms. Jennifer Klimek, representing the Edmonton Friends of the North Environmental Society;
5. Mr. Gavin Fitch, Rooney Prentice, representing the Edmonton Federation of Community Leagues;
6. Mr. William McDonald and Mr. Darin Stepaniuk, Alberta Justice, representing Mr. Kem Singh, Director, Northern Region, Regional Services, Alberta Environment;
7. Mr. Dennis Thomas, Q.C. and Mr. Martin Ignasiak, Fraser Milner Casgrain LLP, representing Inland Cement Inc. (Lehigh Inland Cement Inc.);
8. Mr. James Murphy, Q.C., Ogilivie LLP, representing the Capital Health Authority and the Medical Officer of Health; and
9. the City of Edmonton.

V. COSTS

[282] Prior to the close of the hearing, a number of the Parties indicated to the Board that they reserved the right to claim costs. The Board requests that any of the Parties who have reserved the right to claim costs, provide a submission on costs to the Board within two weeks from the date of the Minister's Order with respect to this Report and Recommendations.

Dated on January 17, 2003, at Edmonton, Alberta.

"original signed by"

_____

William A. Tilleman, Q.C.
Chair

"original signed by"

_____

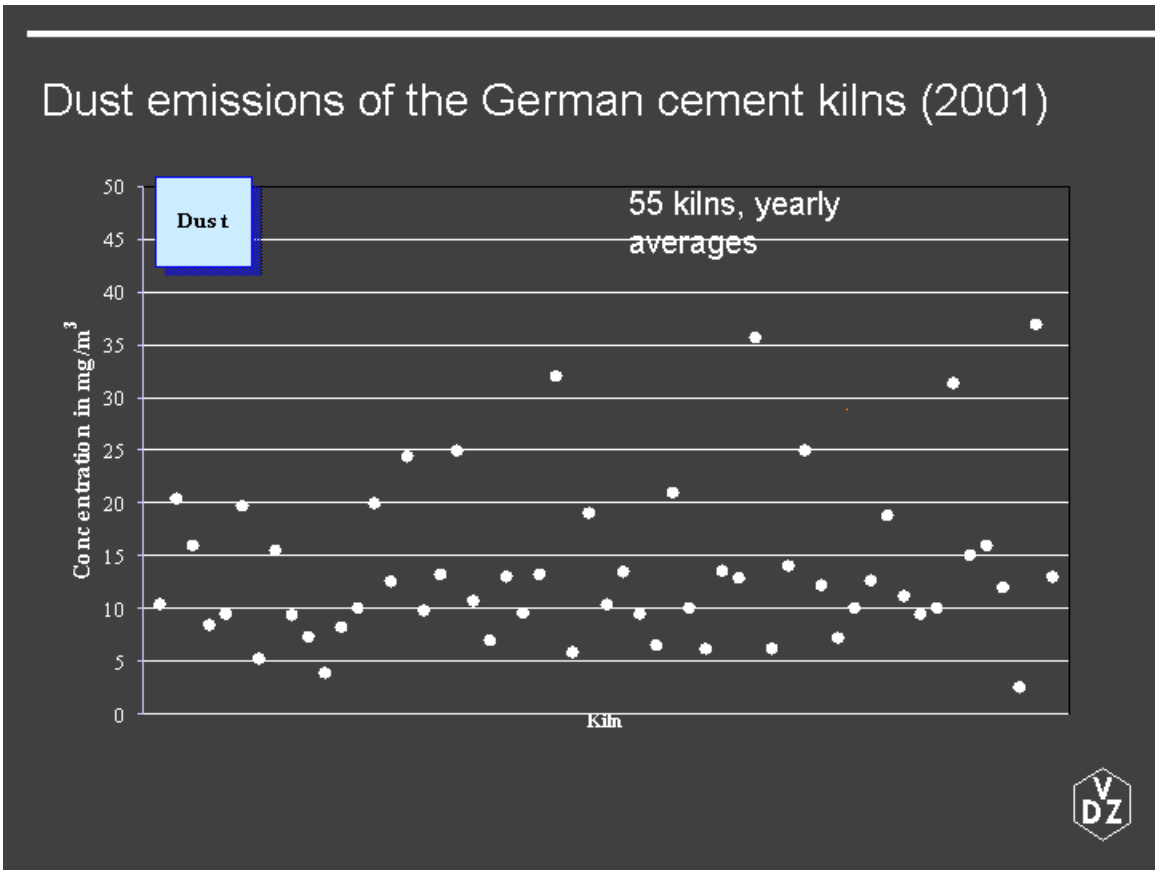
Dr. Steve E. Hrudey

"original signed by"

_____

Mr. Al Schulz

VI. Appendix


Dust emissions of the German cement kilns (2001)
Dust
55 kilns, yearly averages
Concentration in mg/m³
50
45
40
35
30
25
20
15
10
5
0
Kiln
VDZ

VII. Exhibit List

HEARING

November 26, December 16, 17, and 18, 2002
Edmonton, Alberta

Inland Cement Limited
EPEA Amending Approval No. 10339-01-03
Appeal Nos. EAB 02-023, 024, 026, 029, 037, 047 and 074

Exhibit No.	Description
1	Notice of Public Hearing advertisement placed in the Edmonton Sun on October 19 and 29, 2002, the city wide Edmonton Examiner on October 23 and 30, 2002. A news release regarding public hearing forwarded to the Public Affairs Bureau for distribution and placed on the Alberta Government website on November 5, 2002.
2	Notices of Appeal filed by Mr. Ron and Ms. Gail Maga and Mr. Ron Maga Jr., Mr. Cameron Wakefield, Mr. A. Ted Krug, Mr. Stanley Kondratiuk, Dr. Roger G. Hodkinson, Mr. Neil Hayes, and Ms. Anna T. Krug, with respect to Amending Approval No. 10339-01-03.
3	Updated C.V. of Dr. Colin Soskolne (short CV). Submitted by EFONES.
4(a)	V. Goodwin's Response to M. Rawlings and G. Brown's Rebuttal – Handout. Submitted by EFONES.
4(b)	V. Goodwin's Presentation Notes to Environmental Appeal Board – Inland Cement Hearing, December 16, 2002. Submitted by EFONES.
5	Lehigh Inland Cement Limited Group Profit and Loss Accounts (Heidelberger Zement AG-Germany). Submitted by EFONES
6	Towards Ethics Guidelines for Environmental Epidemiologists by Colin Soskolne and Andrew Light. Submitted by EFONES.
7	Report of the Alberta Round Table on Environment and Economy May 1993. Submitted by EFONES.
8	15 documents and pictures used by Neil Hayes during his presentation. Submitted by Neil Hayes.
9	Inland Cement booklet "Working Together to Build Out Communities, Edmonton, Alberta". Submitted by EFONES.
10	Letters dated June 19, 2001 and October 18, 2001 from Mayor Bill Smith, City of Edmonton to Ms. Lorraine Vetsch, Chairperson, Edmonton Friends of the North Environmental Society. Submitted by EFONES.
11	"Notice of Elevated Airborne Emission – December 5, 2002" Lehigh Inland Cement Ltd. received by Ms. Anna Krug. Submitted by EFCL.

Exhibit No.	Description
12	Newspaper articles "Getting gas-guzzlers off the road" and "Paying drivers to take their clunkers off the road more efficient than smog testing". Submitted by EFCL.
13	Presentation by Edo Nyland. Submitted by EFCL.
14	Air Pollution and Daily Mortality in a City with Low Levels of Pollution from Environmental Health Perspectives January 2003. Submitted by Lehigh Inland.
15	Errata of Gordon Brown, Cantox Environmental. Submitted by Lehigh Inland.
16	Air Quality Assessment presentation by Martin Rawlings, Golder Associates. Submitted by Lehigh Inland.
17	Human Health Risk Assessment for Lehigh Inland Cement Limited Substitution Fuel Project presentation by Gordon Brown, Cantox Environment Inc. Submitted by Lehigh Inland.
18	Integrated Pollution Prevention and Control (IPPC) Reference Document on Best Available techniques in the Cement and Lime Manufacturing Industries, March 2000 by the European Commission Joint Research Centre. Submitted by Lehigh Inland.
19	Source Testing Pre-Coal Test Program D Stack Kiln Exhaust Dx Stack Lehigh Edmonton September 3-6, 2002 dated October 16, 2002 (3 pages). Submitted by Lehigh Inland.
20	Undertaking Provided by Dr. Brauer. Submitted by EFONES.
21	Third External Review Draft of Air Quality Criteria for Particulate Matter (April 2002), Volume 1, United States Environmental Protection Agency. Submitted by EFONES.
22	Letter dated June 10, 2002 from Lehigh Inland Cement to Alberta Environment. Submitted by Neil Hayes.
23	Source Testing Pre-Coal Test Program D Stack Kiln Exhaust Dx Stack Lehigh Edmonton September 3-6, 2002 dated October 16, 2002 (5 pages). Submitted by Lehigh Inland.
24	Portland Cement Manufacturing. United States Environmental Protection Agency 1995. Submitted by EFCL.
25	Presentation of Dr. Volker Hoenig, Research Institute of the German Cement Industry. Submitted by Lehigh Inland (on disk).
26	Letter dated June 12, 2002 from Lorraine Vetsch, Chairperson EFONES, to Dr. G. Predy City of Edmonton Medical Officer and attachments. Submitted by EFONES.
27	Definitions of "Best Available Technology". Submitted by Lehigh Inland.

FOR IDENTIFICATION PURPOSES ONLY

Exhibit No.	Description
A.	When Smoke Ran Like Water, Tales of Environmental Deception and the Battle Against Pollution, Devra Davis. Submitted by EFONES
B.	Excerpts from the Director's written submission. Submitted by Alberta Environment.
C.	Written Statement from December 18, 2002 of Mr. Harlan Light to the Environmental Appeal Board. Submitted by Mr. Harlan Light.

VIII. Draft Ministerial Order

Ministerial Order

/2003

Environmental Protection and Enhancement Act
R.S.A. 2000, c. E-12.

Order Respecting Environmental Appeal Board
Appeal Nos. 02-23, 024, 026, 029, 037, 047 and 074

I, Dr. Lorne Taylor, Minister of Environment, pursuant to section 100 of the *Environmental Protection and Enhancement Act*, make the order in the attached Appendix, being an Order Respecting Environmental Appeal Board Appeal Nos. 02-023, 024, 026, 029, 037, 047 and 074.

Dated at the City of Edmonton, in the Province of Alberta this _____ day of _____, 2003.

_____
Honourable Dr. Lorne Taylor
Minister of Environment

Draft Appendix

With respect to the decision of Mr. Kem Singh, Director, Northern Region, Regional Services, Alberta Environment (the "Director"), to issue Approval No. 10339-01-03 (the "Approval") dated May 24, 2002, under the *Environmental Protection and Enhancement Act*, to Inland Cement Limited (now Lehigh Inland Cement Limited), I, Dr. Lorne Taylor, Minister of Environment:

1. Order that the decision of the Director to issue the Approval is confirmed, subject to the following provisions.

2. Order that the Approval be varied by deleting condition 4.1.34 and replacing it as follows:

   "Within 90 days of the date of the Minister's Order in Environmental Appeal Board Appeal Nos. 02-023, 024, 026, 029, 037, 047 and 074, the approval holder shall submit a detailed plan to the Director to replace the ESP with a baghouse system. The baghouse shall be designed and installed so that it operates without a bypass. Subject to condition 4.1.32, in the event the approval holder exceeds six trips in any calendar year before the baghouse is operational, the approval holder shall immediately notify the Director in writing and the Director shall revisit the amount of time required to install the baghouse and reduce the amount of time if possible."

3. Order that the Approval be varied by deleting condition 4.1.37 and replacing as follows:

   "The baghouse referred to in 4.1.34 shall be installed and fully operational as soon as possible, but no later than within 20 months of the date of the Minister's Order in Environmental Appeal Board Appeal Nos. 02-023, 024, 026, 029, 037, 047 and 074, unless authorized otherwise in writing by the Director. The Director may reduce but shall not extend the deadline by which the baghouse shall be installed and fully operational."

4. Order that the Approval be varied by deleting condition 4.1.20 and replacing it as follows:

   "The coal mill baghouse and kiln (D) stack baghouse shall be equipped with broken bag detectors or leak detectors, unless otherwise authorized in writing by the Director."

5. Order that the Approval be varied by deleting Table 4.1-E and replacing it as follows:

"Table 4.1-E: ELECTROSTATIC PRECIPITATOR (ESP) TRIP FREQUENCY LIMITS (EXCLUDING ALLOWANCE FOR COMMISSIONING)

EFFECTIVE PERIOD	TRIP FREQUENCY LIMIT
July 1, 2002 to December 31, 2002	8 trips
January 1, 2003 to December 31, 2003	6 trips
January 1, 2004 to December 31, 2004	6 trips

"

6. Order that the Approval be varied by deleting condition 4.1.10 and replacing it as follows:

   "The approval holder shall either recycle or sell the dust collected in the ESP, the new kiln baghouse replacing the ESP, and the clinker cooler baghouse."

7. Order that the Approval be varied by deleting condition 4.1.51 and replacing it as follows:

   "On or before December 31, 2004, the approval holder shall submit to the Director a proposal to update the screening level risk assessment provided in the Human Health Assessment Report in support of Application No. 008-103339 and the Human Health Risk Assessment of the Lehigh Inland Cement Limited Substitution Fuel Project dated November 21, 2002 (as corrected) prepared by Cantox Environmental Inc. The proposal to update the assessment shall explicitly commit to making maximum use of the monitoring data to be collected according to the requirements of this approval and to developing a terms of reference for the assessment in consultation with the Local Residents Liaison Committee."

8. Order that the Approval be varied by deleting condition 4.1.53 and replacing it as follows:

   "Prior to December 31, 2005, the approval holder shall submit the update referred to in 4.1.52 to the Director."

9. Order that the Approval be varied by deleting the word "and" at the end of the condition 4.1.54 (d).

10. Order that the Approval be varied by deleting condition 4.1.54 (e) and replacing it as follows: "a summary of community input to the design of the assessment; and".

11. Order that the Approval be varied by adding to the end of condition 4.1.54: "(f) any other information required in writing by the Director."

12. Order that the Approval be varied by adding immediately after condition 4.1.54 the following:

"4.1.55 The approval holder shall develop a local residents notification system, that is to the satisfaction of the Director, that will give local residents in the neighbouring communities the option of participating in the system and being notified of any reportable incidents involving particulate emissions from the approval holder. The local residents notification system shall remain in place until the baghouse is operational.

4.1.56 The approval holder shall develop and fund a Local Residents Liaison Committee to the satisfaction of the Director."

Ministerial Order

34/2003

Environmental Protection and Enhancement Act
R.S.A. 2000, c. E-12.

Order Respecting Environmental Appeal Board
Appeal Nos. 02-23, 024, 026, 029, 037, 047 and 074

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Dated at the City of Edmonton, in the Province of Alberta this 22 day of JAN., 2003.

"original signed by"

_____

Honourable Dr. Lorne Taylor
Minister of Environment

Appendix

Respecting Environmental Appeal Board
Appeal Nos. 02-23, 024, 026, 029, 037, 047 and 074

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1. Order that the decision of the Director to issue the Approval is confirmed, subject to the following provisions.
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   > "Within 90 days of the date of the Minister's Order in Environmental Appeal Board Appeal Nos. 02-023, 024, 026, 029, 037, 047 and 074, the approval holder shall submit a detailed plan to the Director to replace the ESP with a baghouse system. The baghouse shall be designed and installed so that it operates without a bypass. Subject to condition 4.1.32, in the event the approval holder exceeds six trips in any calendar year before the baghouse is operational, the approval holder shall immediately notify the Director in writing and the Director shall revisit the amount of time required to install the baghouse and reduce the amount of time if possible."

3. Order that the Approval be varied by deleting condition 4.1.37 and replacing as follows:

   > "The baghouse referred to in 4.1.34 shall be installed and fully operational as soon as possible, but no later than within 20 months of the date of the Minister's Order in Environmental Appeal Board Appeal Nos. 02-023, 024, 026, 029, 037, 047 and 074, unless authorized otherwise in writing by the Director. The Director may reduce but shall not extend the deadline by which the baghouse shall be installed and fully operational."

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>
> 4.1.56 The approval holder shall develop and fund a Local Residents Liaison Committee to the satisfaction of the Director."