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FINAL CONDITIONAL APPROVAL OF GHG CREDIT APPLICATION

June 10, 2009

The Massachusetts Department of Environmental Protection hereby approves, with conditions, an Application for Certification of GHG (Greenhouse Gas) Credits (BWP AQ 27), submitted by Dominion Energy Brayton Point, dated May 10, 2007 and as supplemented in 2007, 2008 and 2009. In accordance with the requirements of 310 CMR 7.00: Appendix B(7)(f), the Department conducted a 30-day public comment period on the proposed approval and considered all comments received. The public comment period ended on December 31, 2008. A copy of the Department's Response to Comments document is included as an attachment at the end of this document.

This Final Conditional Approval of the Application for Certification of GHG Credits (BWP AQ 27) creates 1,089,345 certified GHG Credits for emission reductions that are expected to occur, or have occurred, between August 11, 2006 and December 31, 2012. These credits have been deposited into MA GHG Credit account MAGHG-N-10001; the GHG Credit Account Representative for this account is Gary Courts. The serial numbers of the credits are 11,455,528 through 12,544,872.

GHG Credits from this project, if verified, can only be used by affected facilities for compliance with the CO₂ emissions standards of 310 CMR 7.29, or exchanged for CO₂ allowances in accordance with 310 CMR 7.00: Appendix B(7)(h). Verification applications are subject to the same public comment process as certification applications. Multiple verification applications may be submitted, provided that no more than two verification applications are submitted per year and the total number of GHG Credits requested to be verified does not exceed the number of certified GHG Credits.

Included as part of this Final Conditional Approval are the following:

- (1) A description of the project.
- (2) A table showing the number of GHG Credits certified, by year.
- (3) A list of relevant determinations that the Department has made in accordance with the requirements of 310 CMR 7.00: Appendix B(7).
- (4) An explanation of how the number of GHG Credits proposed for certification was calculated.

- (5) An explanation of how GHG Credits will be verified, including a proposed calculation methodology and any conditions that the Department proposes to place on this Application for Certification of GHG Credits.

Note that the application is also incorporated, by reference, into this Final Conditional Approval letter.

(1) Description of the Project

The applicant proposes to create GHG Credits by processing coal ash for use in place of Portland cement in concrete manufacture. The number of GHG Credits will be based on an estimate of the emissions that would have occurred if Portland cement were used instead of processed coal ash to manufacture concrete. The applicant has identified Headwaters Resources as an operator of the project, as Dominion’s “exclusive ash marketer,” and as the sole “direct purchaser” of fly ash from the project. As described in the application:

Dominion Energy Brayton Point, LLC (Brayton Point) has recently installed an Ash Reduction Process (ARP), which went into commercial operation on August 11, 2006. The ARP is a fluidized bed carbon burnout (CBO) combustion system that burns the carbon remaining in fly ash from the combustion of coal. The end product from the ARP is a Coal Combustion Product (CCP) that is a low carbon fly ash used as a replacement to Portland cement in the production of concrete.

Currently, approximately 95% of the ash from the ARP is transported by Headwaters’ subcontractors to one of 30 concrete producer’s plants. Each concrete producer has approximately 10 (mobile or stationary) plants. The remaining 5% of the ash is marketed by Headwaters to one of 15 stationary locations in the Pre-cast concrete market.

(2) Table showing the number of GHG Credits proposed for certification.

MassDEP is certifying anticipated reductions through 2012, the deadline by which emissions must be reduced, avoided, or sequestered to be eligible for exchange for CO₂ allowances in accordance with 310 CMR Appendix B(7)(h).

Year	Certified GHG Credits
2006 (August-December)	66,771
2007	170,429
2008	170,429
2009	170,429
2010	170,429

2011	170,429
2012	170,429
Total	1,089,345

(3) A list of relevant determinations that the Department has made in accordance with the requirements of 310 CMR 7.00: Appendix B(7). (Defined terms and language that is directly excerpted from regulations appear in italics.)

The Department has made the following determinations:

- The emission reductions are expected to be *Real*, in that, when coal ash is used in place of cement, emissions that would have occurred during the manufacture of cement do not occur.
- The emission reductions are expected to be *Additional*, in that there is no legal requirement to process coal ash for use as a replacement for Portland cement, or to use processed coal ash as a replacement for Portland cement.
- The emission reductions are expected to be *Verifiable*, in that the applicant will provide documents showing the transfer of processed coal ash to Headwaters, an ash marketer with which the applicant has established a contractual relationship.
- The emission reductions are expected to be *Permanent*, in that once concrete has been manufactured using coal ash, the same concrete will never be manufactured using Portland cement.
- The emission reductions are expected to be *Enforceable*, in that, pursuant to 310 CMR 7.00: Appendix B(7)(g)8., violations of the requirements of 310 CMR 7.00: Appendix B(7) may be enforced against any person who applied for certification or verification of GHG Credits, an affected facility that purchases GHG Credits created by this project, or any combination thereof.
- The project commenced *on or after January 1, 2006*, in accordance with 310 CMR 7.00: Appendix B(7)(d)9, in that the ash processing facility commenced operation in August of 2006.
- The project is expected to *generate an annual average over the period applied for of 5,000 or more tons CO_{2e}*, in accordance with 310 CMR 7.00: Appendix B(7)(e)3, in that the project is expected to generate approximately 170,000 tons of CO_{2e} reductions annually.
- The application includes *a proposed method for determining, monitoring and assuring compliance*, in accordance with 310 CMR 7.00: Appendix B(7)(e)4.b, as described in section (5) of this document.
- The application specifies *the best management practice used to determine an emissions baseline*, in accordance with 310 CMR 7.00 B(7)(e)4.b, in that the project achieves greenhouse gas emissions reductions beyond those that would be achieved if current best management practice was employed. The application states:

We are aware of only three other CBO's [fluidized bed carbon burnout combustion systems] currently operating in the country for the express purpose of lowering carbon content in ash from an electric generating facility, so that the ash is then marketable to be beneficially used. Dominion also operates a CBO at its Chesapeake Power Station in Chesapeake, Virginia. In addition, ammoniated ash due to SCRs or SNCRs would normally need to be land filled, if not treated through the CBO so that it can be beneficially used. The only current solution to dealing with ammoniated ash contamination is to process this ash through the CBO, so that the ammonia thermally degrades to nitrogen and water.

Based on the conclusion that the project goes beyond current best management practice for processing and using fly ash to avoid greenhouse gas emissions from cement production, the Department is allowing the use of an emissions baseline based on historical practice at this facility to calculate avoided emissions that occur on or before December 31, 2009.

However, the Applicant should be aware that the Application for Verification of GHG Credits (BWP AQ 28), which must be approved before GHG Credits can be used for compliance or exchanged, requires the applicant to specify a best management practice baseline that reflects practices at similar facilities during the verification period. Because best management practices may change over time, the emissions baseline against which reductions are calculated for verification purposes may not be the same baseline that is approved in the context of this Application for Certification of GHG Credits. In particular, MassDEP is aware of an EPA sponsored program to increase the amount of coal ash used in concrete. Therefore, when evaluating applications to verify reductions that occur on or after January 1, 2010, MassDEP will consider the results of this program, and any other relevant information, to determine the appropriate baseline for use in the verification process.

The method by which best management practices will be incorporated into calculations is described in section (5) of this document.

- The project does not present any potential project leakage.

(4) Explanation of how the anticipated number of GHG Credits was calculated

$$\text{Annual GHG Credits} = N_{\text{baseline}} - N_{\text{project}}$$

Where $N_{\text{baseline}} - N_{\text{project}}$ = the difference between the annual number of tons of CO_{2e} emitted without the project and the annual number of tons of CO_{2e} emitted by the project, calculated thus:

$$N_{\text{baseline}} - N_{\text{project}} = (A - B) \times 0.71$$

Where:

A = the number of tons of ash produced during the baseline year that would have been processed for use in place of Portland cement if the project had been operational during the baseline year;

B = the number of tons of ash processed for use in place of Portland cement during the baseline year;

0.71 = An estimate of the number of tons of CO_{2e} emissions that are avoided when one ton of fly ash is used as a cement replacement. This estimate was derived by the United States Environmental Protection Agency (EPA) using the Building Environmental and Economic and Sustainability (BEES) methodology. The BEES methodology was used by EPA as the primary tool for calculating CO_{2e} emissions impacts in two reports that were published in 2008. (*See Waste and Materials-Flow Benchmark Sector Report: Beneficial Use of Secondary Materials – Coal Combustion Products* and *Study on Increasing the Usage of Recovered Mineral Components in Federally Funded Projects Involving Procurement of Cement or Concrete to Address the Safe, Accountable, Efficient Transportation Equity Act: A Legacy for Users*. In particular, Table D-13 in the latter source includes the numerical estimate used in this application. The document is available at

<http://www.epa.gov/epawaste/consERVE/tools/cpg/pdf/rtc/report4-08.pdf> and the table is on page D-41.)

The sources cited above also include another estimate of the number of tons of greenhouse gas emissions that are avoided when one ton of fly ash is used in concrete production (0.96), which is similar to the one proposed by the applicant for use in calculating avoided emissions associated with this project. There is a difference between the two estimates cited in the EPA reports; MassDEP will use the lower one (0.71). There are uncertainties associated with both estimates; however, since both estimates agree that there would be at least 0.71 tons of avoided GHG emissions per ton of fly ash used in concrete production, there is a higher likelihood that the 0.71 estimate represents avoided emissions that are real and verifiable. This approach is consistent with other GHG Credit approvals under 310 CMR 7.00: Appendix B(7), in light of the relative newness of such projects and the lack of precision in measuring their greenhouse gas reductions, MassDEP is taking a conservative approach to provide greater certainty that all estimated avoided emissions actually occur.

Data and calculations for this application are summarized in the following table:

A	291,837
B	51,796
E	0.71
$N_{\text{baseline}} - N_{\text{project}}$	170,429
Annual GHG Credits	170,429

(5) An explanation of how GHG Credits will be verified, including a proposed calculation methodology and any other conditions that the Department has placed on this Application for Certification of GHG Credits.

This Application for Certification of GHG Credits (BWP AQ 27) is approved, subject to the following conditions:

Each subsequent Application for Verification of GHG Credits (BWP AQ 28) associated with this project shall utilize the following equation to calculate the number of GHG Credits. All necessary data shall be submitted in a format that allows MassDEP to determine, monitor, and assure compliance with all relevant provisions of 310 CMR 7.00: Appendix B(7). The applicant shall make a reasonable effort to submit documents created by independent parties, such as billing records or verification reports, to support verification applications. In particular, for verification applications that cover time periods after December 31, 2008, the applicant shall submit the monthly reports described in the following sentence from the application to MassDEP: "Headwaters provides Dominion a monthly report that details the end use of all ash provided to Headwaters." These reports shall include a general discussion of anticipated and actual end uses, including a list of states to which ash was shipped, and an estimate of the percentage of ash that was shipped to locations outside of New England.

The number of GHG Credits created will be calculated as described below:

$$\text{GHG Credits} = N_{\text{baseline}} - N_{\text{project}}$$

Where $N_{\text{baseline}} - N_{\text{project}}$ = the total number of tons of CO_{2e} that would have been emitted without the project if best management practice had been followed.

$$N_{\text{baseline}} - N_{\text{project}} = (C \times E) - D$$

Where:

C = the net increase in the number of tons of ash used in place of Portland cement due to the project during the verification period, as compared to the baseline period, adjusted for any difference between the length of the certification period and the length of the verification period, calculated thus:

$$C = A - (51,796 \times T)$$

Where:

A = the number of tons of ash that were processed, transferred to Headwaters, and actually used in place of Portland cement in the manufacture of concrete during the verification period;

51,796 = the number of tons of ash processed for use in place of Portland cement during the baseline year.

T = the length of the verification period, in years;

E = An estimate of the number of tons of CO_{2e} emissions that are avoided when one ton of fly ash is used as a cement replacement. For avoided emissions that occur on or before December 31, 2009 this emissions factor shall be equal to 0.71, as described in section (4) of this document. For avoided emissions that occur on

or after January 1, 2010, this emission factor ratio shall be no greater than 0.71, and may be adjusted upward or downward to incorporate new research on the emissions impacts of using fly ash in concrete, to account for project specific factors such as transportation emissions and substitution ratios, or to reflect best management practice during the verification period. If the project constitutes best management practice at any time after January 1, 2010, then E shall be equal to zero and no GHG Credits shall be created for avoided emissions that occur after that time.

D = The estimated number of tons of CO_{2e} emissions reductions that would otherwise be eligible for GHG Credits from this project, but are not eligible because they have been, or will be, used to create offsets or other credits in any other voluntary or regulatory program anywhere in the world. The purpose of this variable is to prevent double counting of emission reductions by concrete manufacturers or end uses that may use ash produced by the applicant, but are not bound by any relationship with the applicant or the Department. The approval of this application does not grant any exclusive right to such claims to the applicant. Instead, the applicant is obligated to make a reasonable effort to be aware of claims by other parties for the same reductions and to use best efforts to avoid creating GHG Credits for reductions that may be claimed by others.

In order to ensure that this requirement is met, each verification application shall include the following components in addition to the proposed numerical value of variable "D":

- If the numerical value of variable "D" is not zero, then an explanation of the tons of CO_{2e} emissions reductions that are included in this value must be provided to the Department.
- An attestation from a knowledgeable and responsible official of Headwaters regarding measures taken to avoid double counting. The sample statement submitted by the applicant in a letter dated August 7, 2008 may be used for this purpose. In light of MassDEP's acceptance of this alternative form, the applicant shall not be required to use MassDEP's standard *Certification of Transfer of Carbon Credits* form.
- An update on the efforts of the American Coal Ash Association Greenhouse Gas Emissions Trading Task Team, as described in the application, to "address the development of cross-industry standards to prevent double counting of offsets created by coal combustion product utilization activities." If applicable, the applicant shall utilize standards developed by these groups to ensure against double counting of emissions reductions that occur on or after January 1, 2009.