

Base Protocol Plan for Gravel and Lightly Surfaced Road Rehabilitation Projects

Fast Track Protocol Development Process

Submitted: February 2009

This document has been prepared by Blue Source Canada ULC on behalf of the Industry Provincial Offset Group Working Group 16: Gravel and Lightly Surface Road Resurfacing.

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Part I: Identification of the Protocol Developer

1.1 Title of the Base Protocol:

Quantification Protocol for Gravel and Lightly Surfaced Road Rehabilitation Projects

1.2 Lead Protocol Developer

| | |
|----------------------|---|
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| Title: | Vice-President, Operations |
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Initiating Entity

| | |
|----------------------|---|
| Organization: | Industry Provincial Offsets Group (IPOG) |
| Name: | |
| Title: | |
| Address: | |
| City: | |
| Province: | |
| Postal Code: | |
| Email: | |
| Website: | http://www.offsetsgroup.ca |
| Telephone: | |
| Fax: | |

1.4 Rationale for initiating the development of the protocol (optional):

There is industry support behind the development of this protocol and a recognized opportunity to generate greenhouse gas offset credits.

Through the Industry Provincial Offset Group, members strive to ensure that protocols are:

- Based on a complete life-cycle analysis with consideration of all relevant GHG sources and sinks;
- Consistent in their treatment of cross-cutting issues;
- Based on accurate and unbiased best science and best practice guidance;
- Fully transparent; and
- Conservative so as to ensure that environmental integrity is maintained.

Part II: Base Protocol Applicability and Development Approach

2.1 Description of the Project Type:

This quantification protocol is written for the project developer completing gravel and lightly surfaced road resurfacing. A typical project would involve the recovery, recycling and re-depositing of the materials from existing gravel and lightly surfaced roads, including some supplementation with new materials, as part of the rehabilitation of the road.

Typically, roads in need of rehabilitation are simply covered up with a new surface, consisting of 1.5 to 6 inches of new materials. The project condition for this protocol is the use of road rehabilitation equipment, which results in the recycling of the aggregate without significant stone fracturing or base contamination.

The process involves recovering aggregate (without damaging the original road bed material – i.e. crushing aggregate) from the existing road bed, mixing the materials to replenishing the design mix ratio and re-depositing the material forming a completely rehabilitated road surface. Some new material may also be required for the rehabilitation.

To meet the requirements under this protocol, the project developer must supply sufficient evidence to demonstrate that:

- The project involves the recovery, recycling and re-depositing of the materials from existing gravel and lightly surfaced roads, including some supplementation with new materials, as part of the rehabilitation of the road; and
- The rehabilitated road meets or exceeds the specifications for traditional resurfacing as dictated by the relevant standard (i.e. guideline or building code).

As there is an opportunity for generating emission reductions from, such projects will positively impact Canada's National GHG Inventory under Energy Sector emissions for Fossil Fuel Production and Manufacturing and Transportation Combustion emissions from Road Transportation.

Given the opportunity for generating emission reductions from gravel and lightly surfaced road resurfacing projects, such projects will positively impact Canada's National GHG Inventory. The following impacts will be realized under the associated sectors, as outlined in the National Inventory Report 1990 – 2005: Greenhouse Gas Sources and Sinks in Canada:

- The reduction of emissions from fossil fuel production as addressed in section 3.2.1 under “Energy Industries (CRF Category 1.A.1)”; and
- The reduction of emissions from fuel combustion for transportation as addressed in section 3.2.3 under “Transport (CRF Category 1.A.3)”.

2.2 Description of Project-specific Technology (if applicable)

For the purposes of this protocol document, rehabilitation is defined as the process by which a road is broken up and its material is re-used for its rehabilitation, using equipment and methodologies equivalent to those developed by Road Badger.

The Road Badger is a piece of road restoration equipment used for dirt, gravel, and lightly surface road product rehabilitation. It connects to the back of a power unit (i.e. a grader or tractor) and is used to rehabilitate and extend the serviceability of gravel, cold mixed, oiled and dust abated roads.

Rather than placing large quantities of additional gravel, emulsifiers and dust abatement products to resurface the gravel or lightly surface road surface, the Road Badger breaks up the road surface and works the existing gravel and other products to restore the road surface without disturbing the existing road grade.

Under this process, the existing road material is cut, separated and loosened from its base. This equipment should not fracture or damage the aggregate, minimizing the need for additional materials. This material is then retrieved, mixed with a small amount of new material if necessary, and re-laid forming a rehabilitated road surface. The reduction in the amount of new material used in the road rehabilitation process provides a reduction in the greenhouse gas emissions associated with the production and transportation of the aggregate or aggregate and binder used in road resurfacing.

2.3 GHG(s) that will be reduced:

The following GHGs will be reduced from gravel and lightly surfaced road resurfacing projects:

- CO₂, CH₄, and N₂O through reduced combustion emissions (from both reduced production and transportation of binder and aggregate).

2.4 Description of how real reductions will be achieved:

The opportunity for generating carbon offsets with this protocol arises from the direct and indirect reductions of greenhouse gas (GHG) emissions by reducing the use of fossil-fuel derived energy during the rehabilitation of gravel and lightly surfaced roads.

Under traditional rehabilitation, an incremental volume of aggregate or aggregate and binder (or other additive - hereafter referred to collectively as binder), would be laid on top of the existing road bed, requiring significant fossil fuel use from the sourcing, processing and transportation of these materials.

Projects applying this protocol achieve fuel savings from the recycling of the recovered, processed aggregate from the existing road bed, reducing the amount of aggregate and binder needing to be sourced, processed and transported to the project site.

A testing period for this activity will not be required prior to full implementation.

2.5 Base Protocol Flexibility (optional):

Flexibility in applying the quantification protocol is provided to project developers in two ways:

1. The calculation of aggregate transportation distances may employ regional average distances from a mining site, if sufficient evidence can be provided; and
2. Site specific emission factors and other project specific factors may be substituted for the generic emission factors indicated in this protocol document. The methodology for generation of these emission factors must be sufficiently robust as to ensure reasonable accuracy.

The project proponent must be able to justify their approach in detail to apply any of these flexibility mechanisms.

2.6 Federal, Provincial/Territorial Legal Requirements & Climate Change Incentives

2.6.1 List of potentially relevant requirements:

None.

2.6.2 List of potentially relevant climate change incentives:

None.

2.7 Building on existing protocols or proprietary information (if applicable)

| | |
|---|--|
| Registered name of protocol: | Quantification Protocol for Lightly Surfaced and Gravel Road Rehabilitation Projects |
| System for which protocol was developed: | Alberta Offset System |
| Date protocol was completed and approved: | May 2008 |
| Developer of the protocol | |
| Name: | Keith Driver |
| Organization: | Blue Source Canada ULC |

2.8 Explanation of how the existing protocol will be adapted:

The existing seed protocol will be adapted through an inclusive, transparent and consistent process coordinated through the Industry Provincial Offset Group's (IPOG) broad membership. In particular, work will be conducted by a protocol technical working

group formed specifically to address adaptation of the protocol in question and potentially other related protocols. Cross-cutting issues groups will also be formed to address issues affecting a range of protocols, and to ensure consistency in approach.

Through this process the format and content of the existing protocol will be updated to meet the requirements of Environment Canada. Apart from the additional elements required, other noteworthy changes may be made to the Alberta Quantification Protocol for Aerobic Landfill Bioreactor Projects to adapt it for national applicability.

These may include the following:

- Quantification of SSR's related to transportation of aggregate and binder (P3, P4, B3 and B4) may be expanded to provide a methodology for estimating vehicle fuel efficiency; and
- Baseline default values of gravel-binder mix required per kilometer paved will be re-evaluated to judge their applicability across Canada.

Adaptation of the existing protocol will follow the multi-step process outlined below:

- Collection of technical and background information related to development, review and approval of the protocol to ensure transparency through the adaptation process;
- Review of the protocol to ensure consistency with Canada's "Turning the Corner" action plan and the requirements of the federal offset system. Any areas of inconsistency with the protocol documentation will be identified in this step;
- Review of existing provincial and federal regulations that could impact the surplus nature of the emission reductions from the project activity. This phase will serve to address the surplus requirement relative to applicable federal and provincial legislation;
- Review of the seed protocol's baseline condition to address the incremental nature of the project activity in the Canadian context. This review will include an assessment of the baseline's compatibility with Canadian best practices and potential alternative baseline approaches;
- Review of the protocol to ensure the quantification methodology is consistent with best practice guidance, and applicable to the range of Canadian geographical and climatic conditions;
- Review of the protocol's measurement and monitoring requirements to ensure they are reflective and reasonable in the Canadian context. This will include a review of data collection requirements and frequency of measurement and monitoring;
- Consideration of other environmental impacts and criteria air contaminants, as required by the "Turning the Corner" action plan;
- Additional analysis to address any outstanding issues identified to date that may present a significant challenge to protocol adaptation. This step will include assembly of the technical working group to drive further analysis;

- Redrafting of protocol to address technical issues identified in the previous steps and to ensure it meets the technical and format requirements of the Canadian offset system;
- Review of any material changes made to the quantification approach using project data to ensure the revised methodology is generally consistent with the original documentation;
- Cross-protocol review of the adapted protocol with other protocols adapted by IPOG, to ensure consistency in scope and approach to quantification; and
- Compilation of documents required for submission of the final draft protocol to Environment Canada for approval. The results of all stages of the review and adaptation process will be summarized and compiled to support Environment Canada's review.

Given the volume of work required under short timelines, multiple agencies will be required to provide a range of technical inputs, perspectives and capacity. To accomplish required tasks and meet timelines, technical resources within IPOG will be mobilized to provide input; drawing on group member's significant experience in protocol and project development.

This IPOG Working Group will draw on the experience of Climate Change Central to manage the adaptation process and to ensure broad stakeholder involvement by parties that may not be comfortable working directly with IPOG.

2.9 Explanation of the nature of the proprietary information and how it might be used in the Base Protocol:

We are anticipating full disclosure and transparency, therefore, there are no perceived issues regarding proprietary information associated with this protocol.

Part III: Declaration / Consent / Signature

The undersigned acknowledges that the undersigned has read, understood and that the undersigned agrees to abide by all the terms, conditions, instructions, and notices set out in the Guide for Protocol Development.

The undersigned acknowledges that the review of, and comments regarding, this base protocol plan or portions thereof does not ensure that the base protocol plan or portions thereof will be used in an Offset System Quantification Protocol by Canada's Offset System for Greenhouse Gases.

The undersigned is legally authorized to use any and all proprietary (or protected) information found in and submitted with the base protocol plan.

The undersigned is duly authorized to sign this application.

The undersigned declares that the base protocol plan submitted for Canada's Offset System for Greenhouse Gases and the information provided on, with or pursuant to this application is true, accurate and complete.

The undersigned consents to the public disclosure, in any manner including, without limitation, posting on Offset System website, of all the information in the base protocol plan and the information submitted with the base protocol plan.

By protocol developer (individual, or an organization's or a corporation's duly authorized representative, date, name, title)

By: **KEITH DRIVER**

Title: **VICE-PRESIDENT, OPERATIONS
BLUE SOURCE CANADA ULC**

Signature: _____

Signed this ____ day of _____, 2008