

Quality Assurance Project Plan (QAPP)  
EPA Region 1 – Assistance and Pollution Prevention Office

Autobody Compliance Assessment Pilot - Demonstrating a Statistical Correlation  
between Assistance Delivered and Behavior Changes

QA Tracking #: RFA 10102

Project Managers:

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Principal Investigators:

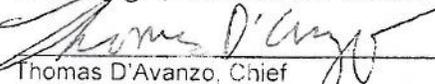
Mary Dever-Putnam, Acting Manager  
EPA Region I, Assistance & Pollution Prevention Office

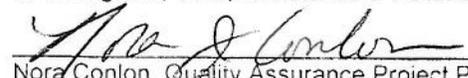
Roy Crystal, Environmental Engineer

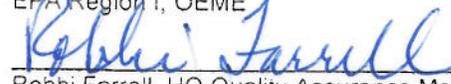
Prepared: March 2010

Approvals:

  
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 EPA Region I, Assistance & Pollution Prevention Office

  
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 EPA Region I, OES, Assistance & Pollution Prevention Office

  
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 EPA HQ, OECA, OC, CASPD

Date:

03/17/10

03/17/10

3/18/2010

3/19/2010

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## Distribution List

Each person listed below will receive a copy of this Quality Assurance Project Plan and any revisions. Individuals taking part in the project may request additional copies of the Quality Assurance Project Plan from these individuals.

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### Contractor Team:

Tracy Dyke-Redmond, Contractor Project Manager  
Industrial Economics, Inc. (IEc), [tdr@indecon.com](mailto:tdr@indecon.com)

Note: Ms. Redmond will distribute the Quality Assurance Project Plan and any revisions to the contractor team, including:

- Chris Leggett  
Subcontractor to IEc
- John Wilhelmi  
ERG, subcontractor to IEc
- Mike Crow  
Subcontractor to IEc

## Executive Summary

EPA Region I & the Office of Enforcement and Compliance Assurance (OECA) have initiated a pilot project that will assess compliance with new and existing requirements pursuant to the Clean Air Act (CAA), the Resource Conservation Act (RCRA) and the Emergency Planning & Community Right to Know Act (EPCRA). This project is designed to measure whether compliance assistance offered and provided to targeted automotive body shops in Eastern Massachusetts helped shops meet compliance requirements as outlined in the new Clean Air Act NESHAP: Paint Stripping & Miscellaneous Surface Coating rule and existing requirements pursuant to both RCRA, and EPCRA. We are interested in measuring whether there is a statistically significant relationship between compliance assistance delivered by Region I assistance providers and the degree to which targeted body shops meet their requirements. We are also interested in testing the reliability of self-reported data by shops through telephone surveys.

To assess autobody shop compliance with requirements, EPA and its contractors will be collecting data from autobody shops in Eastern Massachusetts through phone surveys and site visits. In addition, EPA and its contractors will collect data through phone surveys and site visits from a comparison group of autobody shops in the Tidewater and Piedmont regions of Virginia. This Quality Assurance Project Plan (QAPP) addresses steps to ensure data quality for data collected in Massachusetts. A separate, but similar QAPP will be developed for data collected in Virginia, and the data quality objectives and procedures in that QAPP will be consistent with this document.

EPA is conducting this project with contractor support from Industrial Economics (IEc) and their subcontractors (collectively, the study design team). The study design team worked closely with Office of Management & Budget (OMB) staff to obtain approval for an Information Collection Request (ICR) that incorporates two survey instruments to collect autobody shop data. Given that many aspects of the study design and data collection approach, along with the survey instruments, are incorporated into the ICR approved by OMB, these elements of the project are fixed. To streamline the QAPP and to ensure consistency with the ICR approved by OMB, we have included the ICR as an attachment and referred to sections of it to explain the study design for this pilot project.

This document has been prepared according to the United States Environmental Protection Agency publications *EPA Requirements for Quality Assurance Project Plans* dated March 2001 (QA/R-5) and *Guidance for Quality Assurance Project Plans* dated December 2002 (QA/G-5).

## A. PROJECT MANAGEMENT

### A1. Project Organization

EPA Region I and OECA are the lead organizations with primary responsibility for project coordination and ensuring that data collection and evaluation meet quality assurance criteria. The key individuals involved in project implementation, their project role and organizational affiliation are depicted in Table 1.

Table 1 - Project Implementation Personnel		
Key Individuals	Project Role	Organization Affiliation
Mary Dever-Putnam	Region I Project Manager	EPA Region I, Assistance & Pollution Prevention Office
Emily Chow	HQ Project Manager	EPA Headquarters, Compliance Assistance & Sector Programs Division
Roy Crystal	Environmental Engineer, Principal	EPA Region I, Assistance &

Table 1 - Project Implementation Personnel		
Key Individuals	Project Role	Organization Affiliation
	Investigator	Pollution Prevention Office
Nora Conlon	Quality Assurance Project Plan Coordinator	EPA Region I
Ken Harmon	HQ Work Assignment Manager for contractor support related to implementation (Work Assignment 1-08)	EPA Headquarters, Compliance Assistance & Sector Programs Division
Robbi Farrell	HQ Quality Assurance Manager	EPA Headquarters, Compliance Assistance & Sector Programs Division
Terell Lasane	HQ Work Assignment Manager for contractor support related to data analysis (Work Assignment 1-22)	EPA Headquarters, Evaluation Support Division
Tracy Dyke-Redmond	Project Manager, Contractor Team	Industrial Economics

The following section summarizes the responsibilities of key individuals involved in the project:

*Region I Project Manager, Mary Dever-Putnam, will be responsible for:*

- Overall coordination of project implementation
- Developing, maintaining and amending the QAPP
- Coordinating the compliance assistance outreach including field activity and corresponding data entry
- Coordinating with appropriate officials from MA Department of Environmental Protection (MADEP)
- Developing and conducting training of personnel assigned to a) phone survey data gathering & data entry and b) onsite data gathering and corresponding data entry

*HQ Project Manager, Emily Chow, will be responsible for:*

- Serving as a liaison to the project from EPA Headquarters
- Coordinating with Region I staff and Virginia program staff for activities taking place with the comparison group in Virginia, including ensuring that data gathered in Virginia will be gathered according to the approved project QAPP.
- Ensuring overall consistency of project approach and activities in Region 1 and Virginia
- Overseeing Senior Environmental Employees (SEEs) who will be conducting site visits at the comparison group in Virginia

*Environmental Engineer and Lead Site Assessment Trainer & Investigator, Roy Crystal, will be responsible for:*

- Working with the Region I Project Manager to develop and conduct training related to health and safety, field work and survey implementation, data recording, and data entry
- Conducting site assessments and corresponding data entry
- Coordinating with the HQ Project Manager who will be overseeing project activities in Virginia who will then coordinate and communicate with field personnel including Senior Environmental Employees (SEEs) who will be conducting site visits at the comparison group in Virginia

*Quality Assurance Project Plan Coordinator (QAPPC), Nora Conlon, will be responsible for:*

- Reviewing and approving this QAPP

HQ Quality Assurance Manager, Robbi Farrell, will be responsible for:

- Reviewing the QAPP and coordinating with the Region I Quality Assurance Project Plan Coordinator/reviewer prior to final approval of the QAPP
- Assisting the Region I and HQ Project Managers in meeting QAPP responsibilities
- Maintaining QAPP documentation
- Conducting Readiness Reviews as needed.

*Contractor Project Manager, Tracy Dyke-Redmond*, will be responsible for:

- Managing the contractor team for Work Assignments 1-08 and 1-22 under EPA Contract Number EP -W-07-028 related to implementation support and data analysis
- Coordinating with the Work Assignment Managers, the Region I Project Manager, and the HQ Project Manager to ensure that the contract team is meeting the requirements of the work plan and budget
- Overseeing subcontractors and staff charged with conducting site visits and phone surveys and performing data analysis as described in the approved work plans

## **A2. Problem Definition/Background**

To help fulfill its broad mandate to protect human health and the environment, EPA provides compliance assistance to businesses and other regulated entities (e.g., local governments) to help facilities achieve compliance with environmental regulations understand and improve their environmental performance. The assistance provided as a part of this pilot project primarily relates to the Surface Coating Rule recently promulgated under the Clean Air Act. EPA will require existing sources to be in compliance with the rule by January 10, 2011.<sup>1</sup> Autobody shops represent a key group of sources affected by the Surface Coating Rule. Autobody shops are also governed by many other environmental requirements such as those for RCRA and EPCRA. EPA is committed to helping industry understand existing, new and pending requirements so that they can take proactive measures to achieve compliance with regulatory requirements. During this pilot project, EPA will explain the new requirements of the Surface Coating Rule, and also briefly review existing requirements under RCRA and EPCRA, through several forms of compliance assistance.

This pilot project seeks to statistically demonstrate the correlation between the package of compliance assistance delivered (in the form of written materials, training, and in-person assistance) and performance improvements made by the shops in the pilot population, as evidenced by an increase in the percentage of shops in compliance with key requirements.<sup>2</sup>

## **A3. Project Objectives**

EPA has two objectives in collecting this information for the pilot study: (1) EPA's primary objective is to assess the degree to which its compliance assistance activities can be correlated to improved environmental performance at autobody shops; (2) EPA's secondary objective is to assess the validity of environmental performance information collected by telephone surveys. The Agency frequently relies on telephone surveys to gather information about environmental performance, but such self-reported data may not be accurate, and may suffer from non-response bias.

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<sup>1</sup> Existing sources are also required to submit an Initial Notification to inform EPA that the facility is subject to the standards and when the source will be in compliance by January 11, 2010, and a Notification of Compliance that certifies that the source is in compliance with the applicable requirements with March 11, 2011. For more details about the requirements of the Surface Coating Rule, including requirements for new sources, see EPA's Summary of Regulations Controlling Air Emissions from Paint Stripping and Miscellaneous Surface Coating Operations, Office of Air Quality Planning & Standards (EI 43-02), April 2008, available at [http://www.epa.gov/ttn/atw/area/paint\\_stripb.pdf](http://www.epa.gov/ttn/atw/area/paint_stripb.pdf).

<sup>2</sup> Note that while the pilot project is primarily focused on assessing compliance with key requirements, some additional beyond-compliance behaviors (e.g., measures taken to prevent pollution) may also be measured.

The results from this pilot project will inform EPA's decisions regarding how to assess the effectiveness of compliance assistance for various sectors in a cost-effective and feasible manner. In particular, EPA will use the pilot project data to decide:

1. Whether and or when to conduct rigorous, statistically-based measurement of compliance assistance activities in the future;
2. Whether and or when to rely on phone surveys to measure performance at small businesses, and if so, how these data can be interpreted given the potential for bias; and
3. Whether and or when any adjustments are needed to EPA's compliance assistance strategies for autobody shops, or for other small business sectors subject to new regulations.

#### **A4. Project/Task Description**

##### **Description of the Auto Body Compliance Assessment Pilot Project**

The universe of autobody shops in Region 1 is comprised of over 5,000 shops. This project will target a population of roughly 1,700 eastern Massachusetts autobody shops selected for this study on the basis of specific geographic, demographic, and risk-based factors described in Part B of the ICR supporting statement [Attachment B]. The assistance provided to the autobody shop owner/operators will include:

1. Written information such as brochures, fact sheets, and presentation handouts that describe applicable requirements.<sup>3</sup>
2. Training in the form of workshops located in the communities where autobody shops are located, and on the internet via webinars, and
3. In-person, customized assistance provided during site visits to individual autobody shops. Note, this assistance will occur after the measurement component of the site visit is complete.

EPA will measure the effectiveness of this compliance assistance by:

1. **Comparing shops that did receive assistance in Massachusetts (Group A) to an equivalent group of Massachusetts of shops that did not (Group B).**<sup>4</sup> This measurement will occur two to seven months after assistance is offered, and thus will assess the short-term impact of compliance assistance. Note: after the short-term measurement is complete, Group B shops will also be offered assistance. After both groups in Massachusetts have received assistance, they will be collectively called Group C.
2. **Comparing improvement in performance over time for shops that received assistance in Massachusetts (Group C) to a similar comparison group of shops in Virginia's Tidewater and Piedmont regions that did not (Group X).** The final measurement for this component of the study will occur 18 months after assistance is offered, and is designed to measure the long-term impacts of compliance assistance.<sup>5</sup>

For both the short-term and the long-term evaluations, EPA personnel will conduct on site surveys at a random sample of shops to gather information regarding shop performance on key RCRA, EPCRA and

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<sup>3</sup> Specific materials provided will include a letter inviting the shop to workshops and a CD with outreach materials that includes a multi-media guidance document that includes RCRA requirements and best practices, slides of a standardized presentation that covers the new NESHAP requirements, a sample of an Initial Notification form shops may use to submit their initial notification to EPA as required by the Rule and a brochure summarizing the requirements of the Rule.

<sup>4</sup> These two groups of shops will be considered equivalent because they have been chosen by random assignment; i.e., shops within the study area in Massachusetts have an equal likelihood of being assigned to either receive or not receive assistance in the short term.

<sup>5</sup> The shops in Virginia were chosen to be comparable to the shops in Massachusetts based on NATA Data, a selection of geographic areas where assistance has not been offered and locations of shops in those areas. Provide estimated numbers of shops, and explain why chosen (primarily because state willingness not to pursue proactive compliance assistance activities, which could dampen the ability to detect a treatment effect in the Massachusetts population.) See the ICR for discussion of criteria for selecting a Group X.

Clean Air Act indicators. Examples of the types of shop performance that will be assessed include proper hazardous waste container management, use of efficient spray-coating equipment, employee training on the use of spray coating equipment, and proper maintenance of particulate filters.

In addition, EPA will evaluate the validity of performance data obtained through telephone surveys by combining a telephone survey with follow-up site visits. If the study team finds that the phone survey data are reliable, in 2011 we may ~~will~~ conduct additional phone surveys to supplement the information gathered from site visits to improve the precision of estimates of the effects of compliance assistance.

More details about the design of the Auto Body Compliance Assessment pilot project are described in Attachment A - Part I (b) of the ICR Supporting Statement: Part A, Abstract and Description of the Auto Body Compliance Assessment Pilot Project. Additional details are supplied in Attachment B - the ICR Supporting Statement: Part B.

## **Schedule**

The project began in January of 2009 and will continue until April 2011. In Massachusetts, EPA Region 1 will offer assistance via written materials, workshops, and webinars, and will then measure facility performance via phone surveys and site visits. In Virginia, no assistance will be offered, and instead EPA will measure facility performance via site visits (and possibly phone surveys). A summary schedule follows, and a detailed project schedule is included in Attachment c - the Implementation Plan.

- Group A workshops/Webinars - October 2009 and January 2010
- Groups A & B Phone surveys - March 2010
- Groups A & B & X Site visits – March through May 2010
- Group B workshops/Webinars - July 2010
- Region I will send post cards to offer CA to those who have not received compliance assistance in MA; offer additional training and site visits as requested - August 2010
- Interim SV Report - September 2010
- Possible phone surveys for Groups C & X - February 2011
- Site visits for Groups C & X - March/April 2011
- Final SV Report - September 2011

## **Geographic Focus**

The pilot project focuses on autobody shops collocated in areas in eastern Massachusetts where there are elevated cancer and non-cancer health risks from air pollutants (Source 1999 NATA data.) See Attachment B [Section 2(b)(i) of ICR Supporting Statement: Part B] for a more detailed description of the geographic areas of focus in Massachusetts. In Virginia, the geographic focus was chosen to be the Tidewater and Piedmont regions of the state, which are considered comparable to the shops in Massachusetts in terms of collocation of shops in areas where 1999 NATA data also indicates elevated cancer and non-cancer health risks from air pollutants.

See attached maps of the pilot project areas for both Massachusetts [Attachments D1 & D2] and Virginia [Attachments D3 & D4].

## **A5. Quality Objectives and Criteria**

EPA Region 1 recognizes the importance of ensuring that data are of sufficient quality to meet the needs of the project. Region 1 is committed to collecting and obtaining data of the highest quality possible within the constraints of project resources. Data quality can be characterized in terms of precision, bias, representativeness, completeness, comparability, and sensitivity. EPA's data quality objectives with regard to each of these characteristics follow:

**Precision.** Precision is the measure of agreement among repeated measurements of the same property under identical or substantially similar conditions. To ensure that accurate data are collected, data collectors will receive the same training on interpretation of the inspector checklist and phone surveys, all data will be recorded on paper and then independently entered into separate databases and cross-checked to ensure there are no data entry errors.

**Bias.** Bias is a systematic or persistent distortion of a measurement process that causes errors in one direction. This project seeks to minimize bias by:

- Using random samples to measure performance.
- Using data collection instruments that are designed to ask questions in a clear and objective fashion, so as to minimize bias when facilities provide data. Several survey experts reviewed and commented on the data collection instruments, and EPA conducted a pre-test with autobody shops. EPA incorporated feedback from experts and shops into the data collection instruments, to improve clarity and ensure that questions are correctly interpreted.
- Obtaining key measurements for site visits directly through interviewer observations rather than through survey questions. This will minimize measurement error and eliminate self-reporting bias.
- Minimize non-response bias in on-site surveys by visiting shops during normal business hours, and allowing shops to reschedule the interview if the interviewer arrives at an inconvenient time. In the past, EPA has obtained response rates near 100% during these type of facility visits.
- Minimize non-response bias in telephone surveys by contacting shops shortly after they open for business, as personnel are typically busiest from mid-morning to late afternoon. If the shop indicates that the time is not convenient, the survey will be rescheduled. If the shop does not answer the telephone, at least three additional callbacks will be attempted on different days and at different times.
- Identifying sources of compliance assistance each shop has received, in order to understand the contribution of EPA's compliance assistance efforts.

Note that a key goal of the project to measure the bias that may be associated with non-response and self-reported data collected through phone surveys.

**Representativeness.** Representativeness is the degree to which a sample accurately and precisely represents the larger context. This study design uses random sampling to develop measures that are representative of autobody shops in metropolitan areas or those with elevated air toxics.

The results of the analyses of compliance assistance efficacy will be limited to the population of autobody shops located in the targeted areas in Massachusetts; however, the Agency may use these findings to inform its decisions about whether adjustments are needed with respect to outreach activities to other small business sectors or target audiences where new regulations are pending. In addition and to the extent that data allow, findings related to phone survey validity may be used to support future use of phone surveys in this and other populations to gather performance measurement data.

**Completeness.** Completeness is a measure of the amount of valid data needed to be obtained from a measurement system. EPA is seeking to obtain complete responses on phone surveys and site visits. Phone survey questions have been limited to a relatively small number, which shops should be able to answer in 10 minutes, in order to encourage shops to finish the survey. Site visit questions have been organized to mimic a typical shop walk-through, thus minimizing the time required to collect the necessary data elements

**Comparability.** Comparability is the confidence that the underlying assumptions behind two data sets are similar enough that the data sets can be compared and combined to inform decisions. For comparability, we are collecting comparable data from MA and VA by using the same selection strategy, same survey tools, and all data collection staff will receive the same training regarding how to collect, record, manage and report data. These steps allow us to compare the results from each location throughout the course of the project. No quantitative goal for comparability is necessary.

**Sensitivity.** Sensitivity (sometimes also termed precision) is a measurement of the capability of a method to discriminate between measurement responses representing different levels of the variable of interest. In this case, EPA is seeking sufficient sensitivity in its measurements to be able to detect differences of at least 15 percentage points in the percentage of shops following key requirements in Groups A and B. For the comparison of change over time for Groups C and X (the long-term study), EPA is seeking to be able to detect differences of at least 21 percentage points. For more detail, see Attachment B. [Section 2 c) i) in ICR Supporting Statement: Part B.<sup>6</sup>]

The Agency will use several quality assurance techniques to maximize response rates, response accuracy, and processing accuracy to minimize non-sampling error:

**A6. Personnel, Special Training Requirements or Certifications**

The Project Managers are responsible for ensuring that all personnel involved with data generation in Massachusetts and Virginia (including EPA and state personnel, contractors, grantees and partners) have the necessary QA training to successfully complete their tasks and functions. The Project Managers provided a 2.5-day training session for all data collectors, that included:

- An explanation of compliance requirements and key indicators of shop performance.
- A detailed review of all data collection instruments, and discussion to ensure that each data collector interprets each question in a consistent way. This element of the training is especially important, and will be addressed both through classroom discussions and a walk-through of a facility with all data collectors to ensure consistent interpretation.
- Detailed procedures for how to record data, enter it into the tracking database, and submit it to the contractor for analysis.

This was the agenda for the training:

<b>Statistically Valid Outcomes Autobody Pilot Team Training Agenda</b>	
<b><u>Day 1: Tues Feb 23, 2010 – Classroom Instruction</u></b>	
•	Classroom training at the US EPA Region I Offices located at 5 Post Office Square, McCormack Federal Building, Boston MA 02109
•	8:00 – 8:15 Welcome & Introductions – Susan Studlien, Director Office of Environmental Stewardship, EPA Reg I
	8:15 – 8:45 Overview of Pilot Project (Ken & Emily)
	8:45 – 10:30 Overview of new CAA NESHAP requirements; review of paint booth operations; review air survey questions (Mary & Roy)
	10:30 – 10:45 Break
	10:45 – 12:15 Overview of Hazardous Waste Mgmt/RCRA requirements (Mary)
	12:15 – 1:00 Lunch [Cafeteria in building; sandwich shops within 1 block]
	1:00 – 2:00 Hazardous Waste Mgmt/RCRA continued
	2:00 – 3:00 Overview of Health & Safety (Roy & Beth)
	3:00 – 3:10 Break
	3:10 – 3:45 Overview of steps for Wednesday site visit (Mary)
	3:45 – 4:00 Division of Responsibility for leading Site Visit (Mary)
<b><u>Day 2: Wed Feb 24, 2010 -- Site Visit/Data Gathering &amp; Data Management Instruction</u></b> Note: <b><u>all field staff</u></b> shall wear field appropriate attire including steel toed safety boots, bring hard hat and eye protection.	
	7:30 Team meets @ EPA offices – load van @ corner of Water & Congress St
	7:45 Depart for Greater Lowell Regional HS
	9:00 – 11:00 Conduct Site Assessment (lead shared by primary field staff)
	11:00 – 12:15 Travel back to EPA offices

<sup>6</sup> In the context of the ICR supporting statement, the minimum detectable effects that EPA seeks are characterized as precision targets.

12:15 – 2:15	Working lunch - debrief on site assessment - capture any amendments/edits/new directives for survey instrument – (Mary/Emily)
2:15 - 2:30	Break
2:30 – 3:30	Data Management /Data Entry Instruction (Tracy) in 2 <sup>nd</sup> floor Computer Training Room - (2nd floor across from elevators – Region I employees will need to provide access)
3:30 – 4:00	Practice data entry (All)
4:00 – 4:30	Wrap Up (Mary/Emily)
<b>Day 3: February 25, 2010 (Thursday) – Phone Surveyors ONLY</b> – training located @ EPA Region I Offices, 5 Post Office Square, McCormack Federal Building, Boston MA 02109 4 <sup>th</sup> floor Dorset Mtn Conf Room	
8:00 – 8:30	Welcome & Review of Phone Survey Instrument (Mary)
8:30 – 10:00	Data Management/Data Entry Instruction – Location TBD
10:00 – 10:15	Wrap-Up (Mary/Emily/Tracy)

The following represents those receiving training:

IEc Project Manager: Tracy Dyke Redmond (also providing data mgmt training)

IEc Lead Data Analyst: Chris Leggett

ERG site visitors: Andrew Adelfio, Charles Goodhue, John Wilhelmi, MA site visitors; Kevin Sikora, back-up VA site visitor

IEc phone surveyors: Colin Mahoney & Kate Daniel

Data entry manager: Amy Stillings,

Original data entry: Marie Jorgensen

Duplicate data entry: Karen Boisjoly

Region I Site Visitor: Roy Crystal

Region I Phone Surveyor & Duplicate Site Visit Data Entry: Jorge Burgos

OECA: Emily Chow & Kenneth Harmon

VA DEQ: Patti Procise

SEE Grantee/VA Site Visitor: Charles “Ski” Fabyonic

Data Management & Data Protocol documentation used in the training is available for review at the following URL: <ftp://ftp.indecon.com/receive/Auto%20Body%20Projec/>

## **A7. Documentation and Records**

This project will collect data from autobody shops in Massachusetts and Virginia using:

- A site-visit survey questionnaire approved by OMB (Appendix 1)
- A phone survey questionnaire approved by OMB (Appendix 2)

These records will be maintained in paper and electronic formats, and there will be a duplicate of each record for verification procedure and backup.

Additional records and documents that will be produced in conjunction with this project include:

- Pre/Post Tests for Workshops
- Facility outreach materials, including workbook, fact sheets, brochures, etc.
- Final QAPP, including all amendments
- Data handling reports
- Project interim and final report (to include discussion of QA issues encountered, and how they were resolved)
- Photographs (not required but may be taken with approval by facility representatives)
- Federal register involvement plans (see Quality Control Requirements)

Files, paper records, and other media will be maintained at EPA for a period of three years after the completion of the grant. Electronic files will be maintained for a minimum of three years after completion

of the project. Electronic files will be maintained on the EPA network servers and will also be regularly backed up by the Project Manager through our regional backup solution called Offline File Synchronization. OFS stores all data files on the network, It also stores a local copy of data making the data files available when disconnected from the EPA network. Any additions or changes made to local data will be automatically updated back to the network upon login.

The Quality Assurance Officer shall retain all updated versions of the QAPP and be responsible for distribution of the current version of the QAPP. The Quality Assurance Coordinator and the Project Manager will approve updates. The Project Manager shall retain copies of all management reports, memoranda, and all correspondence between the EPA and all project personnel identified in **Table 1**.

All data files sent to the contractor team (specifically databases containing the original entries of phone survey and site visit data, along with duplicate databases) will be maintained on the contractors' servers and will be backed up every night on-site. The network where the data is maintained is password protected, and access to the project-specific folders will be restricted, so that only staff working on the project has access to the data.

## **B. DATA GENERATION AND ACQUISITION**

### ***B1. Sample Process Design and Sampling Methods***

See Attachment B [section 2, Survey design, in ICR Supporting Statement: Part B] for a detailed description of the sampling design and sampling approach. The contractor will use STATA™ software for random assignment and sample selection.

### ***B2. Sample/Data Handling and Custody Requirements***

Prior to collecting data, a copy of each questionnaire will be printed out for each autobody shop included in the site visit and phone survey samples. Each questionnaire will be assigned a unique ID number, which will be written in indelible ink on each page of the questionnaire. Site visitors and phone surveyors will fill out responses by hand directly on the printed questionnaires using indelible ink. Changes to such data records will be made by drawing a single line through the error with an initial by the data collector. For any questionnaires that are not complete (e.g., the autobody shop refuses to complete process), data collectors will note on the hard copy questionnaire form which questions were not answered, and the reason given. Such records will be preserved in hard copy, all data, even for surveys that are only partially completed will be entered into the databases.

At the end of each working day during the data collection period, or at the earliest practical time following a site visit, site visitors will create a duplicate copy of all questionnaires completed that day. Original and duplicate data will be stored by separate staff people, so as to maintain a backup of the original data in paper format. VA on-site surveyor will scan the completed questionnaires and send the electronic duplicate to the HQ Project Manager and IEc contractors for processing duplicate data entry.

A staff person at each office involved in data collection (EPA Region 1, IEc, and ERG) will be responsible for maintaining and entering the original site visit and phone survey records into the corresponding databases (one for phone surveys, the other for site visits). These databases have been prepared by the contractor team in MS-Access™, and each staff person responsible for entering data will maintain their own copy of the database.

One staff person at each office will be responsible for collecting duplicate site visit and phone survey forms, and entering them into a single duplicate database (one for phone surveys and one for site visits). Only yes/no, multiple choice, and pull-down menu data will be entered in the duplicate records. (Because it is difficult to get multiple staff to enter data in an open text format consistently, e.g., due to extra spaces or different punctuation, the project team will not double-enter this open text data.)

All original and duplicate databases files will be named with the person and organization responsible for the data, and will be sent to IEC for cross-checking double-keyed entries at a designated due date. In 2010, the due date for receipt of database files will be June 5, 2010. The 2011 date will be set in October of 2010 when the Pilot Team assesses the remaining schedule for the project. IEC will write and run VBA code to confirm the match between duplicate records for each unique facility ID number. If IEC identifies any errors, the contractor will notify the data collection/entry staff person of the facility ID and question number where the error was detected. The data collection/entry staff person will reconcile the duplicate records and inform IEC as to what the true value should be, and IEC will ensure that both original and duplicate data sets match the true values. IEC will then re-run the VBA code to ensure that all discrepancies have been corrected.

During the course of conducting phone surveys and site visits, some shops identified at the start of the pilot project will have either ceased operating or was operating as a business other than an automotive refinishing and or body shop. When any phone surveyor or site visitor encounters this situation, they will immediately inform the Project Managers. It is the responsibility of the Project Managers to remove shops officially from our pilot universe in MA and VA and inform the IEC Contractors as to the changes in universe size. We do not intend to reduce the sample sizes of shops to be surveyed (by phone or on site) due to downward changes in the pilot universe size.

For more details regarding site visit data handling procedures and phone survey protocols, see Attachments E1 (Site Visit Data Handling Procedures) & E2 (SV Phone Survey Protocol).

The Project Manager will have ultimate responsibility to ensure that all data reporting is consistent with the requirements and procedures used for data validation and data assessment described in this QAPP.

### ***B3. Analytical Methods***

No physical tests or chemical analyses are anticipated for this project.

This project will follow recognized statistical analytical methods for survey samples. Methods for analyzing survey data are summarized in Attachment B [part 5, Analyzing and Reporting Survey Results, in ICR Supporting Statement: Part B.] A detailed description of analytical methods will be provided in the data analysis plan to be prepared by the contractor team, and with interim and final reports. The contractor will use STATA™ software for data analysis.

### ***B4. Quality Control***

As described in Section B2. above, the project team will cross-check all phone survey and site visit data except for open text values. The contractor team will check for discrepancies between the double-entered data. In addition, the contractors responsible for conducting the data analysis will identify a procedure for checking for data anomalies (such as outliers and missing data). These procedures will be specified in the project data analysis plan.

The contractor team will prepare summary statistics of data quality problems at the close of the project (i.e., unresolved data anomalies as a percentage of the number of data points) and a narrative description of problems encountered and any potential bias in the data caused by data anomalies. This documentation will be reviewed by the QA Manager, and the Project Manager will include this information in the data evaluation section of the final project report (see Element D3).

### **Instrument/Equipment Testing, Inspection and Maintenance**

Not applicable. No physical samples are to be taken in this project.

### **Instrument/Equipment Calibration and Frequency**

Not applicable. No physical samples are to be taken in this project.

**Inspection/Acceptance for Supplies and Consumables**

Not applicable. No physical samples are to be taken in this project.

***B5. Data Acquisition Requirements (Non-direct Measurements /Secondary Data)***

In addition to phone survey and site visit data collected as part of this pilot, this project will rely upon secondary data including computer databases and historical records. These secondary data are described in Table 2.

Table 2 – Secondary Data			
Data	Source	Intended Use	Limitations/ Acceptance Criteria
List of autobody shops in Massachusetts	<i>Dunn &amp; Bradstreet</i> and <i>Reference USA</i> (detailed process for developing this data described below)	Identify shops in the sampling frame	The list of shops identified may not include all informal facilities (e.g., those that are not licensed or registered), which could bias the data. However, EPA has used the most inclusive data possible, and will note this limitation in the final report.
List of cities and towns in MA & VA with elevated cancer and non-cancer health risks due to air pollutants	1999 National Air Toxics Assessment & corresponding list of cities and towns with elevated risks. (detailed process for using this data described below)	Identify shops in the sampling frame	NATA data is modeled air data not actual air monitoring data.
MA list of registered autobody shops	MA DEP	To help control for bias related to facilities that may have been influenced by state intervention.	Use of this data by site visitors is limited to cross-checking the MA DEP for shops we intend to sample. If shops are not on the MA DEP lists, site visitors will inform the Region I Project Manager who will provide the total list of shops not on MA DEP's list at the conclusion of our site visits in 2010 and 2011.
Facility submissions of Initial Notifications	Shops submittals to EPA via EPA Air Clerk	Assessing the extent to which assisted facilities may be more likely to comply with notification requirements.	These notifications are required by all shops whether or not they receive compliance assistance by EPA
Facility submissions of Notifications of Compliance	Shops submittals to EPA via EPA Air Clerk	Assessing the extent to which assisted facilities may be more likely to comply with notification requirements.	These notifications are required by all shops whether or not they receive compliance assistance by EPA

In determining how to prioritize shops for site assessments and compliance assistance for autobody outreach in general and specifically for the pilot project, Region I assistance staff requested that our EPA Region I librarian create a sector universe list to be used for outreach on new CAA requirements. The Librarian utilized our Region I license to search *Dunn & Bradstreet* and *Reference USA* database using NAICS (North American Industry Classification System) code 811121 -- Automotive Body, Paint, and Interior Repair and Maintenance. This U.S. industry comprises establishments primarily engaged in repairing or customizing automotive vehicles, such as passenger cars, trucks, and vans, and all trailer bodies and interiors; and/or painting automotive vehicles and trailer bodies.

Note: *Cross-References*. Establishments primarily engaged in--

- Automotive glass replacement, repair and/or tinting--are classified in U.S. Industry 811122, Automotive Glass Replacement Shops;
- Manufacturing automotive vehicles and trailers or customizing these vehicles on an assembly-line basis--are classified in Subsector 336, Transportation Equipment Manufacturing; and
- Motorcycle repair and maintenance services--are classified in Industry 811490, Other Personal and Household Goods Repair and Maintenance.

Once a list of shops was created, the list was provided to our Region I GIS contractor staff to plot the locations of the shops on maps in New England. Next, the GIS staff were asked to plot additional data layers including NATA (National Air Toxics Assessment) data - cancer risk and non-cancer risk as well as available asthma data (available for MA). Once plotted, high density clusters of shops - consisting of a number of shops in urban centers and a handful of shops in abutting towns - emerged where areas of risk (cancer and noncancer) were collocated. This same risk-based targeting process was applied to shops in Virginia as well.

#### ***B4. Data Management***

See Section B2. Sample/Data Handling and Custody Requirements.

### **C. ASSESSMENT/OVERSIGHT**

#### ***C1. Assessments and Response Actions***

The QAPP Coordinator will review and provide comments on this QAPP and any future amendments and will provide findings to the Project Managers regarding any necessary corrections and improvements to this QAPP and any future amendments prior to data collection activities commence. Further, the Project Managers (and QAPP Coordinator) will thoroughly debrief project implementation staff a short time after beginning their respective implementation tasks, to identify emerging/unanticipated problems and take corrective action, if necessary.

#### ***C2. Reports to Management***

Two kinds of reports will be prepared: interim and final annual reports. Progress reports will note the status of project activities and identify whether any QA problems were encountered (and, if so, how they were handled). Project final report will analyze and interpret data, present observations, draw conclusions, identify data gaps, and describe any limitations in the way the data should be used.

<b>Table 3 – Project QA Reports</b>			
	<b>Frequency</b>	<b>Prepared By</b>	<b>Recipients</b>
Amended QAPP	Before primary data collection begins.	Project Manager	All recipients of original QAPP
Interim Report	Once	Project Manager and Principle Investigators	USEPA Project Officer (Copying USEPA OPEI)
Final Project Report	Once	Project Manager and Principle Investigators	USEPA Project Officer (Copying USEPA OPEI)

## **D. Data Validation and Usability**

### ***D1. Data Review, Validation, or Verification***

This QAPP and its subsequent amendments shall govern the operation of the project at all times. Each responsible party listed in *Section A - Project Organization* shall adhere to the procedural requirements of the QAPP and ensure that subordinate personnel do likewise.

This QAPP shall be reviewed in October 2010 to ensure the project is on track to achieve all intended purposes, and to identify any needed adjustments to data quality procedures. All the responsible persons listed in *Section A - Project Organization* shall participate in the review of the QAPP. The Project Managers and the Quality Assurance Manager are responsible for determining that data are of adequate quality to support this project. The project will be modified as directed by the Project Managers. The Project Manager shall be responsible for the implementation of changes to the project and shall document the effective date of all changes made.

It is expected that from time to time ongoing and perhaps unexpected changes will need to be made to the project. The Project Manager shall authorize all changes or deviations in the operation of the project. Any significant changes will be documented in an amendment to the QAPP; no significant changes are expected, since this project is governed by an already approved ICR. All verification and validation methods will be noted in the analysis provided in the final project report.

### ***D2. Verification and Validation Methods***

The QAPP Coordinator will review and provide comments to the Project Managers regarding the completeness of this QAPP before key data collection steps (as described in Element C1). Also, the Data Processing Manager will prepare data handling reports, to be reviewed by the QA Officer, after each data collection step and each data analysis step. These reviews and reports will be guided by the data quality objectives and performed in accordance with Region 1's Quality Management Plan.

If at any point during verification and validation the QA Manager identifies a problem (e.g., the use of substandard data when higher-quality data are available, a faulty algorithm, a mismatch between a data set and the question it is meant to answer), the Project Manager, QA Manager, and any other relevant staff will discuss corrective action. If necessary, the Project Manager will coordinate with the relevant Work Assignment Manager to issue a stop-work order until a solution is agreed upon. The Project Manager will implement corrective action. If the solution involves changes in project design, the Project managers will amend the QAPP as necessary and distribute the new revision.

### ***D3. Reconciliation with Data Quality Objectives***

The final project report will contain an evaluation of the certainty of project results. The Project Managers will prepare this evaluation in consultation with the QA Manager. For each conclusion reached by the project (i.e., each determination that an anticipated outcome has or has not been achieved, and the basis for each decision made or recommended by project authorities), this evaluation will describe, in narrative form: the quality of data and the methodologies used to inform the conclusion, the subsequent confidence in the conclusion, and the validity of generalizing results beyond the project (if applicable).