NATIONAL YOUTH TOBACCO SURVEY 2012-2014

SUPPORTING STATEMENT: PART B

Submitted by:

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B. COLLECTIONS OF INFORMATION EMPLOYING STATISTICAL METHODS

This study will employ a repeat cross-sectional design to develop national estimates of tobacco use behaviors and exposure to pro- and anti-tobacco influences among students enrolled in grades 6-12. The study represents the continuation of the NYTS cycles that took place in 1999, 2000, 2002, 2004, 2006, 2009 and 2011. The NYTS came before OMB for the first time in 2003 after management of the survey was passed from the American Legacy Foundation to CDC.

As presented in this supporting justification, every effort has been made to maintain the methodology established in prior cycles of the NYTS to permit comparability across cycles. The primary objectives of the NYTS are to develop estimates of tobacco use behaviors and exposure to pro- and anti-tobacco influences among students enrolled in middle school and high school grades; to identify differences related to demographic characteristics (age, grade, gender, and race/ethnicity); and to determine whether there are time trends in tobacco use behaviors and exposure to influences that promote or discourage tobacco use. Data from the NYTS provide a comprehensive picture of the tobacco use behaviors of adolescents and their exposure to pro- and anti-tobacco influences. Data are reported at the national level only; no school district or regional estimates will be produced. Such information is required to support CDC's responsibilities in providing technical assistance in the planning, monitoring, and evaluation of national, state, and local tobacco prevention and control programs.

B.1 RESPONDENT UNIVERSE AND SAMPLING METHODS

The universe for the study will consist of public and private school students in grades 6 through 12 in the 50 States and the District of Columbia. Students in public, Catholic and other private schools will be included in the universe.

The sampling frame for schools has been obtained from Quality Education Data, Inc. (QED, now operating as MDR). MDR/QED data encompasses both private and public schools and includes the latest data from the Common Core of Data from the National Center for Education Statistics. School-level data on enrollment by grade and minority race/ethnicity are available in this data set. For more than 40 years, MDR has provided information on K-12, higher education, library, early childhood, and related education organizations. The commercial sampling frame provided by MDR is nationally recognized as the most complete, current, and accurate education databases available in the industry.

Table B-1 displays the current U.S. distribution of eligible schools by urban status and type of school. This tabulation was computed over a frame of eligible schools with middle school and/or high school grades prepared using the latest QED files. ¹

¹ We created a dichotomy of urban vs. non-urban schools using the Metro Status categorical variable available in these files.

Table of School Type by Urban Status				
School Type	Urban Status			
Frequency Percent Row Pct Col Pct	Non Urban	Urban	Total	
Catholic	721	5,169	5,890	
	1.29	9.26	10.56	
	12.24	87.76		
	3.57	14.51		
Private	1,664	7,585	9,249	
	2.98	13.59	16.58	
	17.99	82.01		
	8.25	21.29		
Public	17,786	22,871	40,657	
	31.88	40.99	72.87	
	43.75	56.25		
	88.18	64.20		
Total	20,171	35,625	55,796	
	36.15	63.85	100.00	

Table B1 - Distribution of Schools by Urban Status and School Type

B.2 PROCEDURES FOR COLLECTION OF INFORMATION

B.2.a Statistical Methodology for Stratification and Sample Selection

A national probability sample will be selected that will support national estimates by grade, gender, and grade by gender for students enrolled in grades 6-12. Additional details of the sampling plan are provided in Attachment L. The design will support separate estimates of the characteristics of white, black, and Hispanic students by school level (high school and middle school). The procedures for stratification and sample selection are consistent with those previously followed in the NYTS.

Sampling Frame. The sampling frame representing the 50 States and the District of Columbia will be stratified by urban status and by minority concentrations. The definition of urban status strata, distinguishing urban and non-urban areas, will be based on MSA versus non-MSA areas. The sample will be structured into geographically defined units, called PSUs (primary sampling units), which consist of one county or a group of small, contiguous counties. Table B-1 provides the distribution of eligible middle schools and high schools in the frame.

<u>Selection of PSUs.</u> A total of 100 PSUs will be selected with probability proportional to the student enrollment in the PSU. The PSUs will be allocated to the strata in proportion to the total eligible student enrollment in the stratum. This approach will increase the sampling efficiency by generating a nearly self-weighting sample.

<u>Selection of Schools.</u> Schools will be classified by enrollment size as small, medium or large. Small schools contain one or more grades with less than 25 students per eligible grade. The remaining schools are classified as medium if they have fewer than 50 students in any of the eligible grades for the level (middle school or high school); otherwise they are considered large schools.

Among large schools, two schools will be selected in each sample PSU, one middle school and one high school, with probability proportional to the measure of enrollment size, Therefore, a total of 200 large school (100 high schools and 100 middle schools) selections will be made at the second stage from the 100 sample PSUs. Among small schools, a separate random sample of 10 middle schools and 10 high-schools schools per level will be taken from 10 sub-sample PSUs. Similarly, 12 medium high-schools and 12 medium middle-schools will be selected from a sub-sample of 12 PSUs.

<u>Selection of Students.</u> All students in a selected classroom will be selected for the study. Classes in each school are selected based on two very specific scientific parameters to ensure a nationally representative sample. First, classes have to be selected in such as way that all students in the school have a chance to participate. Second, all classes must be mutually exclusive so that no student is selected more than once. In each school, once we have determined the type of class or time period from which classes will be selected, we randomly select the appropriate number of classes within each grade. To maintain acceptable school participation rates, it is essential that each school have input in the decision of which classes will be sampled in their school. Examples of class sampling frames that have been used in past surveys include all 2nd period classes or a required physical education class. <u>As long as the scientific sampling parameters are met, we work with each school to identify a classroom sampling frame that will work best for each school.</u>

<u>Refusals.</u> School districts, schools, or students who refuse to participate in the study will not be replaced in the sample. We will record the characteristics of schools that refuse along with reasons given for their refusal for analysis of potential study biases.

B.2.b Estimation and Justification of Sample Size

The NYTS is designed to produce the key estimates accurate to within \pm 5% at a 95% precision level. Estimates by grade, gender, and grade by gender meet this standard. The same standard is used for the estimates for racial/ethnic groups by school level.

The derivation of sample sizes is driven by these precision levels for subgroup estimates, specifically for the smallest subgroups defined by grade and by gender. With a sample size of approximately 3,500 participants by grade—totals of 10,500 and 14,000 for middle school and high school grades, respectively—the design will ensure the required precision levels for design effects as large as 3.0. As shown in Attachment L, subgroups of size 1,750, such as those defined by grade and by gender, will achieve the +/-5% precision levels for 95% confidence intervals.

We propose to replicate key aspects of the sampling design followed in the 2011 NYTS. Refinements typically occur in response to the changing demographics of the in-school population and to meet CDC's policy needs. For example, current trends of increasing percentages of minority students likely will lead to more efficient sampling of minority students and to smaller overall sample sizes. In addition, the proposed design will more effectively oversample black and Hispanic students by increasing the sampling intensity in those schools with high concentrations of these minority groups.

Across the previous cycles of the NYTS, the school participation has averaged 89%, with a low of 83%. Student participation has averaged 90% with a low of 88%. We have assumed slightly lower, more conservative values in developing the sample design for the 2012 NYTS: 85% for schools and 85% for students.

The proposed sample consists of 100 PSUs with 2 large schools selected per PSU at the second stage, for a total sample of 200 large schools augmented by a sample of 24 medium schools and 20 small schools. The expectation is that approximately 85% or 207 of these schools will participate in the survey.

The anticipated total number of participating students is 24,591. Of the 100 large high schools and 100 large middle schools, 80 of each group will be randomly chosen to the double class sampling group. In other words, we will select two classes per grade in these schools (i.e., 6 classes in middle schools and 8 classes in high schools), to ensure that target precision levels are met for minority group estimates. Among large schools, only one class per grade level will be selected for the other sample schools (20 high schools and 20 middle schools). Similarly, one class per grade level will be selected in medium schools.

With these sample sizes, the projected number of black students will be approximately 2,275 and 2,096 for high school and middle schools, respectively. Somewhat higher numbers are expected for Hispanic students, 2,563 for high schools and 2,260 for middle schools.

B.2.c. Estimation and Statistical Testing Procedures

Sample data will be weighted by the reciprocal of the probability of case selection and adjusted for non-response. The resulting weights will be trimmed to reduce mean-squared error. Next, the strata weights will be adjusted to reflect true relative enrollments rather than relative weighted enrollment. Finally, the data will be post-stratified to match national distributions of high school students by race/ethnicity and grade. Variances will be computed using linearization methods. NYTS data are also used for trend analyses where data for successive cycles are compared with statistical testing techniques. Statistical testing methods are used also to compare subgroup prevalence rates (e.g., male versus female students) for each cross-sectional survey. These tests will be performed with statistical techniques that account for the complex survey

design.

Confidence intervals vary depending upon whether an estimate represents the full population or a subset, such as a particular grade, gender, or racial/ethnic group. Within a grouping, they also vary depending on the level of the estimate and the design effect associated with the measure.

Based on the prior NYTS studies, as well as on precision requirements that have driven the sampling design, we can expect the following subgroup estimates to be within $\pm 5\%$ at 95% precision level:

- Estimates by grade, gender, and grade by gender
- Minority group estimates by school level for blacks and Hispanics

For the former estimates, these levels will flow from projected sample sizes of 3,517 participating students per grade, and therefore, approximately 1,758 by gender within grade. For the latter estimates, the anticipated number of participants in each minority group is at least 1,961 per school level. For conservative design effect scenarios (design effects as large as 3.0), estimates based on these subgroup sample sizes will be within +/- 5 percentage points at the 95% confidence level.

B.2.d Use of Less Frequent Than Annual Data Collection to Reduce Burden

The CDC NYTS was initially designed as a biennial survey. However, as witnessed during the 1990s, youth tobacco use can increase or decrease rapidly, making biennial collection less than optimal. On June 22, 2009 the Family Smoking Prevention and Tobacco Control Act was enacted, which gave FDA the authority to regulate tobacco products. Under this new authority, a number of regulatory and enforcement actions are underway or will be commencing soon, including the prohibition of certain types of tobacco advertising and promotion, prohibition of the sale of single cigarettes, elimination of flavors in cigarettes (other than menthol), enforcement of youth access restrictions, and the introduction of graphic warning labels on cigarette packs. In order to ensure that FDA's goal of protecting young people from tobacco use is met, annual data collection is needed to monitor the impact of FDA's actions on public health as well as to measure potential unintended consequences (such as increased use of currently unregulated tobacco products such as e-cigarettes and little cigars). The collection of annual data is particularly important in the first few years following FDA's regulatory authority as many regulations are being implemented in a short time frame. Rather than develop a completely new surveillance system to monitor measures critical to FDA regarding youth tobacco use, thereby increasing burden, the FDA has partnered with CDC to leverage the existing NYTS system to collect annual data that will be useful to both FDA and CDC. The annual NYTS will monitor tobacco product usage among the nation's youth and collect key information which will assist the FDA in ensuring that their efforts are protecting the public's health. The collaboration between CDC and FDA in administering the NYTS annually will efficiently allow both agencies to meet their goals.

B.2.e Survey Instrument

The NYTS questionnaire (Attachment I1) contains 81 items, which can be roughly divided into the following groups. The first set of questions on the questionnaire gather demographic data. Most of the remaining questions address the following tobacco-related topics: tobacco use (cigarettes, smokeless tobacco, cigars, pipes, bidis, and clove cigarettes), knowledge and attitudes, media and advertising, minors' access and enforcement, school curriculum, cessation, and environmental exposure to tobacco smoke. The questions are in a multiple-choice format and will be administered as an 8-page optically scannable questionnaire booklet.

B.2.f Data Collection Procedures

Data will be collected by a small staff of professional data collectors, specially trained to conduct the NYTS. The time during the school day in which the survey is administered varies by school. This decision is made in coordination with each school to ensure that the type of class or period of the day selected for sampling 1) meets the scientific sampling parameters to ensure a nationally representative sample and 2) results in the least burden/highest possible acceptability for the school. Each data collector will have direct responsibility for administering the survey to students. Data collectors will follow a questionnaire administration guide (I7). Teachers will be asked to remain at the front or back of the classroom and not to walk around the room monitoring the aisles during survey administration because doing so could affect honest responses and compromise anonymity. Teachers also will be asked to identify students allowed to participate in the survey and to make sure non-participating students have appropriate alternative activities. The rationale for this is to increase the candor and comfort level of students. The only direct responsibility of teachers in data collection is to distribute and follow up on parental permission forms sent out prior to the scheduled date for data collection in the school. Teachers are provided with a parental permission form distribution script (Attachment I2) to follow when distributing permission forms to students. The Data Collection Checklist (Attachment H1) is completed by teachers to track which students have received parental permission to participate in the data collection. The teachers receive instructions on completing the Data Collection Checklist in the "Letter to Teachers in Participating Schools" (Attachment H2). The data collector will utilize the information on the Data Collection Checklist to identify students eligible for a make-up survey administration; this information will be recorded by the data collector on the "Make-up List and Instructions" document (also included in Attachment H1). In general, our data collection procedures have been designed to ensure that:

- Protocol is followed in obtaining access to schools
- Everyday school activity schedules are disrupted minimally
- Administrative burden placed on teachers is minimal
- Parents give informed permission to participate in the survey
- Anonymity of student participation is maintained, with no punitive actions against nonparticipants
- Alternative activities are provided for nonparticipants
- Control over the quality of data is maintained

B.2.g Obtaining Access to and Support from Schools

All initial letters of invitation will be on CDC letterhead from the Department of Health and Human Services and signed by, Timothy McAfee, MD, MPH, Director of the Office on Smoking and Health, NCCDPHP at CDC. The procedures for gaining access to schools will have three major steps:

- Notify State health and education agencies in states with sampled schools and invite states to participate. Obtain written support from both agencies. Confirm existence and grade range of selected schools. Request that the state notify school districts that they may anticipate being contacted about the survey.
- Once cleared at the state level, invite school districts in which selected schools are located to participate in the study. For Catholic schools and other private schools, invite the office comparable to the school district office (e.g., diocesan office of education). Obtain approval for participation at the district level. Confirm existence of school, grade range, and the principal's name, address, and telephone number. Request that the school district notify schools that they may anticipate being contacted about the survey. Request general guidance on working with the selected schools.
- Once cleared at the school district level, invite selected schools to participate. Confirm information previously obtained about the school. Present the burden and benefits of participation in the survey. After a school agrees to participate, develop a tailor-made plan for collection of data in the school (e.g., select classes; determine whether survey will be administered to selected class sections simultaneously or in serial). Obtain approval for participation at the school level. Ensure that all materials reach the school well in advance of when they are needed. Maintain contact with schools until all data collection activities have been completed.

Prior experience suggests the process of working with each state's health and education agencies, school districts and schools will have unique features. Communication with each agency will recognize the organizational constraints and prevailing practices of the agency. Scripts for use in guiding these discussions may be found in Appendices C1 (state-level), D1 (district-level), and E1 (school-level). Copies of letters of invitation can be found in Attachment E2 (states-level); Attachment F2 (district-level); and Attachment G2 (school-level). Attachment G2 also contains the NYTS Fact Sheet for Schools. Attachment G3 contains a copy of the letter to be sent to school administrators once they have agreed to participate.

B.2.h Informed Consent

The permission form informs both the student and the parent about an important activity in which the student has the opportunity to participate. By providing adequate information about the activity, it ensures that permission will be informed. A copy of the permission form is contained in Appendices G4 (English version) and G5 (Spanish version). In accord with the No Child Left Behind Act, the permission form indicates that a copy of the questionnaire will be available for review by parents at their child's school. A waiver of written student assent was obtained for the participation of children because this research presents no more than minimal risk to subjects, parental permission is required for participation, the waiver will not adversely affect the rights and welfare of the students because they are free to decline to take part, and it is thought that some students may perceive they are not anonymous if they are required to provide stated assent and sign a consent/assent document. Students are told "Participating in this survey is voluntary and your grade in this class will not be affected, whether or not you answer the questions." Completion of the survey implies student assent.

B.2.i **Quality Control**

Table 2 lists the major means of quality control. As shown, the task of collecting quality data begins with a clear and explicit study protocol and ends with procedures for the visual inspection and scanning of collected data. In between these activities, and subsequent to data collector training, measures must be taken to reinforce training, to assist field staff who run into trouble, and to check on data collection techniques. Because the ultimate aim is production of a high quality database and reports, various quality assurance activities will be applied during the data collection phase.

B.3 <u>METHODS TO MAXIMIZE RESPONSE RATES AND DEAL WITH</u> <u>NONRESPONSE</u>

B.3.a Expected Response Rates

The study requires a final yield of approximately 24,500 students. It is necessary to draw an initial sample that is considerably larger than this target number to compensate for school and student non-participation. On prior cycles of the NYTS, school participation averaged 89%, with a low of 83%; student participation averaged 90% with a low of 88%. For the 2012 NYTS, we conservatively have assumed 85% school and 85% student participation. A \$500 incentive will be offered to each participating school.

Survey Step	Quality Control Procedures		
Mail Out	 Check inner vs. outer label for correspondence (5% sample) Verify that any errors in packaging were not systematic (100%) 		
Previsit Logistics Verification	• Review data collection procedures with school personnel in each school to ensure that all preparatory activities were performed properly (100%)		
Receipt Control	 Verify that a sample of forms received the prior day were logged in and are stored in the proper location (5%) Require entry of staff ID in receipt control and all other transactions (100%) 		
Telephone Contacts	• Monitor early sample of scheduling and follow-up telephone calls to ensure that the caller follows procedures, elicits proper information, and has proper demeanor (10%)		
Manual Editing	 Verify initial editing by all editors until standards are achieved (100%) Spot check editing by editor (5%) 		
Computer Scanning	 Transcribe questionnaires that are not scannable (100%) Remove any scannable form that reflects intentional misuse by a respondent (100%) 		

Table B3 - Major Means of Quali	ty Control
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NYTS participation rates traditionally have been relatively high compared to other federally funded, national, school-based, health related surveys of high school students. For example, the widely cited *Monitoring the Future* survey (formerly known as the *High School Senior Survey*) achieves substantially lower participation rates. The participation rates established by the NYTS are the product of the application of proven and tested procedures for maximizing school and student participation.

As indicated in A.16.c, it is desirable to complete data collection before the final month of school (i.e., by mid-April to mid-May, depending on location). Many schools are very busy then with standardized testing and final exams; in addition, attendance can be very unstable, especially among twelfth grade students.

B.3.b <u>Methods for Maximizing Responses and Handling Nonresponse</u>

We distinguish among six potential types of nonresponse problems: refusal to participate by a selected school district, school, teacher, parent, or student; and collection of incomplete information from a student.

To minimize refusals at all levels--from school district to student--we will use a variety of techniques, emphasizing the importance of the survey. Given the subject matter is tobacco, we expect that a few school districts or schools will need to place the issue of survey participation before the school board. To increase the likelihood of an affirmative decision, we will: (1) work

through the state agencies to communicate its support of the survey; (2) indicate that the survey is being sponsored by CDC; (3) convey to the school district or school that the survey has the endorsement of many key national educational and health associations, such as the National PTA, American Medical Association, National Association of State Boards of Education, Council of Chief State School Officers and the National School Boards Association; (4) maintain both a toll-free hotline to answer questions from the school board; (5) offer a package of educational products to each participating school, as recommended by OMB in approving the 1998 YRBS in alternative schools (OMB No. 0920-0416, expiration 12/98) and implemented on NYTS ever since; (6) comply with all requirements from school districts in preparing written proposals for survey clearance; (7) convey a willingness to appear in person, if needed, to present the survey before a school board, research committee, or other local entity tasked with reviewing the survey; and (8) offer schools a monetary incentive of \$500.

The sampling plan does *not* allow for the replacement of schools that refuse to participate due to concern that replacing schools would introduce bias. All participating state departments of health and education, school districts, and schools also will be sent a copy of the published survey results.

Maximizing responses and dealing with refusals from parents, teachers, and students require different strategies. To maximize responses, we will recommend that schools help to advertise the survey through the principal's newsletter, PTA meetings, and other established means of communication. Reminders will be sent to parents who have not returned parental permission forms within an agreed upon time period (e.g., three days); those who do not respond to the reminder will be sent a second and final reminder. The permission form will provide a telephone number at CDC that parents may call to have questions answered before agreeing to give permission for their child's participation. Permission forms will be available in English, Spanish, and any other languages spoken by a large percentage of parents in a given school district. Field staff will be available on location to answer questions from parents who remain uncertain of permission. Bilingual field staff will be used in locations with high Hispanic concentrations (e.g., California, Florida, New York City, and Texas).

Teacher refusals to cooperate with the study are not expected to be a problem because schools already will have agreed to participate. Refusals by students who have parental permission to participate are expected to be minimal. No punitive action will be taken against a nonconsenting student. Nonconsenting students will not be replaced. Data will be analyzed to determine if student nonresponse introduces any biases. To minimize the likelihood of missing values on the survey, students will be reminded in writing in the questionnaire booklet and verbally by the survey administrator to review the optically scannable questionnaire before turning it in to verify that: (1) each question has been answered, (2) only one oval is filled in for each question with the exception of questions instructing the respondent to choose one or more answers (e.g. the question on race asks the student to mark each race that applies); and (3) each response has been entered with a No. 2 pencil, fills the oval, and is dark. A No. 2 pencil will be provided to each survey participant to reduce the likelihood that responses will not scan properly, which would produce missing values. In addition, when completed questionnaires are visually scanned later at project headquarters, any oval that is lightly filled in will be darkened (unless they appear to be erasures) and stray marks will be erased before the forms are scanned. Missing values for an individual student on the survey will not be imputed.

B.4 TESTS OF PROCEDURES OR METHODS TO BE UNDERTAKEN

The NYTS core questionnaire items—those identified for use both nationally and at the state level—originally were subjected to cognitive analyses by RTI in 1999. This cognitive analysis directly affected the first NYTS questionnaire fielded in 1999. Cognitive analyses of a small number of new questions were conducted in the fall of 2003 to investigate potential sources of error. A limited pretest of the NYTS 2004 questionnaire also was conducted in August 2003. Cognitive testing was undertaken again prior to the 2006 NYTS. Specifically, testing evaluated revisions to certain existing core survey questions and additional new items subsequently under consideration. In April 2005, a pretest of the NYTS 2006 questionnaire was conducted by the contractor in the Prince George's County, Maryland in accord with OMB guidelines. The pretests sharpened the articulation of certain survey questions and confirmed the existing empirical estimate of the survey burden.

The 2012 NYTS is based on the 2011 NYTS questionnaire but includes 26 new questions to facilitate FDA and CDC efforts authorized by the Family Smoking Prevention and Tobacco Control Act. Cognitive interviews were conducted with 9 students on July 12, 2011 on new questions recently added to the 2012 NYTS, as well as a handful of older questions for which response categories may need to be refreshed over time (e.g., those that mention popular websites). Interviews were not conducted based on errors or item non-response from previous iterations of NYTS. In summary, the cognitive interviewing participants found the survey instrument clear and easy to complete. The new questions that were tested, changes made if any, and final question wording are provided in Attachment I-8. This attachment also provides a list of questions that were removed to maintain the previous length of 81 items; thus, not increasing the burden on students who will receive the questionnaire.

The NYTS questionnaire has been used extensively in seven prior national school-based surveys, three of which did not fall under OMB purview because they were funded by the American Legacy Foundation. The state YTS containing the same core items as the NYTS has been implemented by states since as early as 1998, with one state (Florida) having conducted the YTS during fourteen consecutive school years.

B.5 INDIVIDUALS CONSULTED ON STATISTICAL ASPECTS AND INDIVIDUALS COLLECTING AND/OR ANALYZING DATA

B.5.a Statistical Review

Statistical aspects of the study have been reviewed by the individuals listed below.

Dr. Ronaldo Iachan, Ph.D.	William H. Robb, M.S.
Senior Statistician	Statistician
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B.5.b <u>Agency Responsibility</u>

Within the agency, the following individual will be responsible for receiving and approving contract deliverables and will have primary responsibility for data analysis:

René Arrazola, MPH Centers for Disease Control and Prevention Office on Smoking and Health, Epidemiology Branch 4770 Buford Highway NE, MS-K50 Atlanta, GA 30341 Phone: 770-488-2414; Fax: 770-488-5848 E-mail: <u>RArrazola@cdc.gov</u>

B.5.c <u>Responsibility for Data Collection</u>

The representative of the contractor responsible for conducting the planned data collection is:

Katherine H. Flint, M.A. Project Director ICF Macro, Inc. 11785 Beltsville Drive, Suite 300 Beltsville, Maryland 20705 Phone: 301-572-0333; Fax: 301-572-0986 E-mail: KFlint@icfi.com

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