EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-26

☐ Other ☒ Amendment Number: 000001

Contract Number: EP-D-14-032

Contract Period: 09/16/2014 To 09/15/2017

Base Option Period Number: 2

Title of Work Assignment/SF Site Name: BenMAP-CE/PM Risk/Exp Assess

Contractor: INDUSTRIAL ECONOMICS, INCORPORATED

Specify Section and paragraph of Contract SOW: 1,10,14

Purpose:
- ☐ Work Assignment
- ☒ Work Assignment Amendment
- ☐ Work Plan Approval
- ☐ Work Assignment Close-Out
- ☐ Incremental Funding

Period of Performance: From 11/17/2016 To 09/15/2017

Comments:
This amendment to change Neal Fann, WAM, to Alternate WAM, and for Breanna Alman to become primary WAM.
Breanna's contact info: email: alman.breanna@epa.gov, Phone No.: 919-541-2351.

☐ Superfund — Accounting and Appropriations Data — ☒ Non-Superfund

SFO (Max 2) ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period: 09/16/2014 To 09/15/2017 Cost/Fee: LOE:

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor WP Dated: Cost/Fee LOE:

Cumulative Approved: Cost/Fee LOE:

Work Assignment Manager Name: Breanna Alman
(Signature) (Date)
Branch/Mail Code:
Phone Number:
FAX Number:

Project Officer Name: Carolyn Blake
(Signature) (Date)
Branch/Mail Code:
Phone Number: 919-541-5256
FAX Number:

Other Agency Official Name
(Signature) (Date)
Branch/Mail Code:
Phone Number:
FAX Number:

Contracting Official Name: Natalia Fisher-Jackson
NATALIA FISHER-JACKSON
Digitally signed by NATALIA FISHER-JACKSON
DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=NATALIA FISHER-JACKSON, dnQualifier=0000016076
Date: 2016.11.17 16:23:39 -05'00'
(Signature) (Date)
Branch/Mail Code:
Phone Number: 919-541-3564
FAX Number:

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-26

☐ Other ☐ Amendment Number:

Contract Number: EP-D-14-032

Contract Period: 09/16/2014 To 09/15/2019

Base Option Period Number: 2

Title of Work Assignment/SF Site Name: BenMAP-CE/PM Risk/Exp Assess

Contractor: INDUSTRIAL ECONOMICS, INCORPORATED

Specify Section and paragraph of Contract SOW: 1,10,14

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [X] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 09/16/2016 To 09/15/2017

Comments:
The work plan and cost estimate dated 10/06/2016 have been received, reviewed, and are hereby approved for 798 hours and $117,659.66. No previously performed work shall be duplicated.

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (Max 2) ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

	Cost/Fee	LOE
Contract Period: 09/16/2014 To 09/15/2019	$0.00	0
This Action:	$117,659.66	798
Total:	$117,659.66	798

Work Plan / Cost Estimate Approvals

	Cost/Fee	LOE
Contractor WP Dated: 10/06/2016	$117,659.66	798
Cumulative Approved:	$117,659.66	798

Work Assignment Manager Name: Neal Fann	(Signature)	(Date)	Branch/Mail Code:
			Phone Number: 919-541-0209
			FAX Number:
Project Officer Name: Carolyn Blake	(Signature)	(Date)	Branch/Mail Code:
			Phone Number: 919-541-5256
			FAX Number:
Other Agency Official Name	(Signature)	(Date)	Branch/Mail Code:
			Phone Number:
			FAX Number:
Contracting Official Name: Natalia Fisher-Jackson	NATALIA FISHER-JACKSON (Signature)	Digitally signed by NATALIA FISHER-JACKSON DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=NATALIA FISHER-JACKSON, dnQualifier=0000016076 Date: 2016.11.02 22:01:37 -04'00' (Date)	Branch/Mail Code:
			Phone Number: 919-541-3564
			FAX Number:

EPA

United States Environmental Protection Agency
Washington, DC 20460

Work Assignment

Work Assignment Number: 2-26

☐ Other ☐ Amendment Number:

Contract Number: EP-D-14-032	Contract Period: 09/16/2014 To 09/15/2019 Base Option Period Number 2	Title of Work Assignment/SF Site Name: BenMAP-CE/PM Risk/Exp Assess
Contractor: INDUSTRIAL ECONOMICS, INCORPORATED	Specify Section and paragraph of Contract SOW: 1, 10, 14	

Purpose:
- [X] Work Assignment
- [ ] Work Assignment Amendment
- [ ] Work Plan Approval
- [ ] Work Assignment Close-Out
- [ ] Incremental Funding

Period of Performance: From 09/16/2016 To 09/15/2017

Comments:

THE WORK ASSIGNMENT INCLUDES 270 HOURS FOR PREPARATION OF THE WORKPLAN/COST ESTIMATE AND TO BEGIN THE WORK ASSIGNMENT. THE CONTRACTOR SHALL PROPOSE THE HOURS NECESSARY TO COMPLETE ALL TASKS. NO PREVIOUSLY PERFORMED WORK SHALL BE DUPLICATED. SEE ATTACHED SOW.

☐ Superfund — Accounting and Appropriations Data — [X] Non-Superfund

SFO (Max 2) ☐

Note: To report additional accounting and appropriations date use EPA Form 1900-69A.

Line	DCN (Max 6)	Budget/FY (Max 4)	Appropriation Code (Max 6)	Budget Org/Code (Max 7)	Program Element (Max 9)	Object Class (Max 4)	Amount (Dollars)	(Cents)	Site/Project (Max 8)	Cost Org/Code
1										
2										
3										
4										
5										

Authorized Work Assignment Ceiling

Contract Period: 09/16/2014 To 09/15/2019 Cost/Fee: LOE:

This Action:

Total:

Work Plan / Cost Estimate Approvals

Contractor WP Dated: Cost/Fee LOE:

Cumulative Approved: Cost/Fee LOE:

Work Assignment Manager Name: Neal Fann (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-0209 FAX Number:
Project Officer Name: Carolyn Blake (Signature) (Date)	Branch/Mail Code: Phone Number: 919-541-5256 FAX Number:
Other Agency Official Name: (Signature) (Date)	Branch/Mail Code: Phone Number: FAX Number:
Contracting Official Name: Natalia Fisher-Jackson NATALIA FISHER-JACKSON (Signature) (Date)	Digitally signed by NATALIA FISHER-JACKSON DN: c=US, o=U.S. Government, ou=USEPA, ou=Staff, cn=NATALIA FISHER-JACKSON, dnQualifier=0000016076 Date: 2016.08.31 16:08:32 -04'00' Branch/Mail Code: Phone Number: 919-541-3564 FAX Number:

I. TITLE: Enhancing BenMAP-CE to Support the PM Risk and Exposure Assessment

II. WORK ASSIGNMENT MANAGER (WAM):

Neal Fann
EPA, OAQPS, OAR
C539-07
RTP, NC 27711
919-541-0209

III. LEVEL OF EFFORT:

Hours :
Duration: 12 months (September 16th 2016 to September 15th 2017)

IV. BACKGROUND:

In 2003 the U.S. EPA contracted with a developer to create version 1.0 of the environmental Benefits Mapping and Analysis Program (BenMAP). That tool systematized a number of the steps of a health impact and benefits analysis that had previously been performed using the Criteria Air Pollutant Modeling System (CAPMS). Subsequent versions of BenMAP incorporated a number of new features, including a database that could be modified by end-users, more spatially resolved baseline health data and a broader array of health impact functions. The U.S. EPA has used BenMAP to estimate the avoided human health impacts and economic benefits of a number of air quality policies, including the 2002 Non-Road Diesel rule, the 2004 Clean Air Interstate Rule, and the 2011 Mercury and Air Toxics rules, among many others. Over 50 researchers have published over 25 journal articles using BenMAP.

Beginning in 2011, the U.S. EPA began redeveloping the tool from the ground-up to meet two goals: (1) create an open-source software platform so that anyone could see the software code and improve the program; (2) improve the performance, accessibility, capabilities and usability of the software. In the Fall of 2013, after iterating through dozens of beta versions, the U.S. EPA released version 1.0 of the environmental Benefits Mapping and Analysis Program—Community Edition (BenMAP-CE). In the winter of 2015, the Agency released version 1.1 of the software, which addressed a number of bugs identified in version 1.0 and incorporated several new features designed to make it easier for non-U.S. analysts to apply the program.

Under Work Assignment 0-06, the Contractor identified opportunities to make the pooling module in BenMAP-CE easier to use by rationalizing the user interface. Under Work Assignment 0-04, the Contractor developed BenMAP-CE

training materials, including a module instructing users in how to operate the PopSim tool for the United States. Under that Work Assignment, the Contractor identified the steps necessary to expand the scope of PopSim to other countries already covered in the Global Burden of Disease project. This Work Assignment continues the progress made under these two work assignments

V. STATEMENT OF WORK (SOW):

The Contractor shall conduct the following tasks in accomplishing the objective of this Work Assignment.

Task 1.a: Develop work plan and administer project

Within 20 calendar days of the effective date of this WA, the Contractor shall submit a work plan to the Work Assignment Manager (WAM). The Contractor shall arrange and conduct an initial phone conference with the WAM within one week of WA approval. Subsequent to this initial teleconference, the Contractor shall lead regular phone conferences on at least a weekly basis to discuss work progress and any issues associated with the work tasks. The Contractor shall prepare an agenda for such weekly meetings, record meeting minutes, and distribute such meeting minutes to all participants.

Task 1.b: Update the system design document

The Contractor, consulting with the WAM, shall develop a comprehensive and detailed project plan for each task in this WA, specifying clearly the technical and functional basis for the new version:

- The minimum design characteristics of the new software
- A workflow describing the expected inputs and outputs of each new program algorithm, including example use cases.
- Desired behavior of the graphical user interface, including sketches of windows, location of hover text, etc.
- Protocol for quality assurance of each new feature.
- Sequence in which the Contractor will address the tasks below.

The Contractor shall not modify the source code until the WAM approves this project plan. The Contractor shall develop the system design document for each new BenMAP-CE feature on a rolling basis and in consultation with the Work Assignment Manager.

Deliverables:

1.1. Work plan
1.2. System design document

Task #2: Procure, Format, and Incorporate into BenMAP-CE Baseline Hospital Admission and Emergency Department Visit Rates from the Healthcare Cost and Utilization Project.

Task 2.a: Procure the data

The Contractor shall procure the county-level hospital admission and emergency department visit from the U.S. Department of Health & Human Services' Agency for Healthcare Cost and Utilization Project's Healthcare Cost and Utilization Project (HCUP). The Contractor shall purchase these county-level data:

- For each state participating in the HCUP program
- For the most recent single year available

The Contractor shall procure these data on behalf of the U.S. Government and thus will pay the non-profit or Federal Agency fee. The attached excel spreadsheet provides additional details regarding costs and participating states.

Task 2.b: Format, import and quality-assure the input data

The Contractor shall calculate baseline hospital and emergency department visit rates according to the following specifications:

- Rates shall be calculated as per person per year, where the population used to calculate each rate will match the year of this hospital and emergency department visit data.
- The Contractor shall calculate rates for each health endpoint and age range defined in BenMAP-CE v1.3 as well as additional endpoints specified by the WA-COR.
- Among those states for which the HCUP data are not available, the Contractor shall substitute a rate calculated from neighboring states.

Task 2.c: Incorporate rates into BenMAP-CE

Having formatted the hospital admission and emergency department visit rates, the Contractor shall:

- Develop BenMAP-CE-ready input files.
- Import these new rates to BenMAP-CE v1.3.

- Perform a series of sensitivity analyses comparing the number of estimated hospital and emergency department visits calculated using these newly updated rates as compared to the existing HCUP rates calculated using 2007 data.
- Update the user manual technical appendices to reflect the source of these new data and the states for which the county-level rates are available.

Deliverables:
2.1 Procure data
2.2 Format, import and quality assure input data
2.3 Incorporate new data into BenMAP-CE and perform sensitivity testing

Task #3: Modify BenMAP-CE to Enable Users to Assign Health Impact Functions to Discrete Geographic Areas

The Contractor shall modify the BenMAP-CE program so that users can apply a health impact function to a discrete geographic location—for example, a region, state or county. The Contractor shall modify BenMAP-CE so that it:

- Allows users to assign a function to a specific geographic area within either the function editor or "on the fly" using the BenMAP-CE GIS.
- Estimates health impacts only for each location to which that health impact function is assigned.
- Can import a user-provided spreadsheet of health impact functions assigned to discrete geographic areas
- Reports clearly the health impact estimates in the report window and GIS for each geographic area.

The Contractor shall reference closely the system design document and consult regularly with the WA-COR. The Contractor shall perform one or more test cases to be reviewed by the WA-COR.

The Contractor shall not modify the source code until the WAM approves this project plan.

Deliverables:
3.1 Draft location-specific health impact function feature
3.2 Final location-specific health impact function feature
3.3 Document changes to user interface and new algorithms in the user manual

VI. REPORTING REQUIREMENTS:

All reports shall be in accordance with contract specifications. The Contractor shall submit work products in electronic as well as hard copy form. In addition, the Contractor shall deliver to the WAM each draft and final report in electronic format that is readable by OAQPS's windows-based word-processing (Microsoft Word 2007), graphics (Microsoft PowerPoint 2007), spreadsheet (Excel 2007), and database (Access 2007) programs.

VII. QA Requirements:

The Contractor shall include a quality assurance section in the final report discussing the data used with respect to precision, accuracy, representativeness, comparability, completeness, sensitivity and appropriateness as it applies to this use and its source. The QA section shall discuss how the Contractor ensured that the environmental data were of acceptable quality and that they were being used for the purpose for which they were collected.

VIII. DELIVERABLES:

The Contractor shall adhere to the following schedule:

Task	Deliverable	Delivery Schedule
1	Cost estimate	20 days after effective date of WA
2a	Procure data	1 months after effective date of WA
2b	Create input files	2 months after effective date of WA
2c	Incorporate rates into BenMAP-CE	3 months after effective date of WA
3	Modified version of BenMAP-CE allowing users to assign effect coefficients to locations	6 months after effective date of WA

I. TITLE: Enhancing BenMAP-CE to Support the PM Risk and Exposure Assessment

II. WORK ASSIGNMENT MANAGER (WAM):

Neal Fann
EPA, OAQPS, OAR
C539-07
RTP, NC 27711
919-541-0209

III. LEVEL OF EFFORT:

Hours :
Duration: 12 months (September 16th 2016 to September 15th 2017)

IV. BACKGROUND:

In 2003 the U.S. EPA contracted with a developer to create version 1.0 of the environmental Benefits Mapping and Analysis Program (BenMAP). That tool systematized a number of the steps of a health impact and benefits analysis that had previously been performed using the Criteria Air Pollutant Modeling System (CAPMS). Subsequent versions of BenMAP incorporated a number of new features, including a database that could be modified by end-users, more spatially resolved baseline health data and a broader array of health impact functions. The U.S. EPA has used BenMAP to estimate the avoided human health impacts and economic benefits of a number of air quality policies, including the 2002 Non-Road Diesel rule, the 2004 Clean Air Interstate Rule, and the 2011 Mercury and Air Toxics rules, among many others. Over 50 researchers have published over 25 journal articles using BenMAP.

Beginning in 2011, the U.S. EPA began redeveloping the tool from the ground-up to meet two goals: (1) create an open-source software platform so that anyone could see the software code and improve the program; (2) improve the performance, accessibility, capabilities and usability of the software. In the Fall of 2013, after iterating through dozens of beta versions, the U.S. EPA released version 1.0 of the environmental Benefits Mapping and Analysis Program—Community Edition (BenMAP-CE). In the winter of 2015, the Agency released version 1.1 of the software, which addressed a number of bugs identified in version 1.0 and incorporated several new features designed to make it easier for non-U.S. analysts to apply the program.

Under Work Assignment 0-06, the Contractor identified opportunities to make the pooling module in BenMAP-CE easier to use by rationalizing the user interface. Under Work Assignment 0-04, the Contractor developed BenMAP-CE

training materials, including a module instructing users in how to operate the PopSim tool for the United States. Under that Work Assignment, the Contractor identified the steps necessary to expand the scope of PopSim to other countries already covered in the Global Burden of Disease project. This Work Assignment continues the progress made under these two work assignments

V. STATEMENT OF WORK (SOW):

The Contractor shall conduct the following tasks in accomplishing the objective of this Work Assignment.

Task 1.a: Develop work plan and administer project

Within 20 calendar days of the effective date of this WA, the Contractor shall submit a work plan to the Work Assignment Manager (WAM). The Contractor shall arrange and conduct an initial phone conference with the WAM within one week of WA approval. Subsequent to this initial teleconference, the Contractor shall lead regular phone conferences on at least a weekly basis to discuss work progress and any issues associated with the work tasks. The Contractor shall prepare an agenda for such weekly meetings, record meeting minutes, and distribute such meeting minutes to all participants.

Task 1.b: Update the system design document

The Contractor, consulting with the WAM, shall develop a comprehensive and detailed project plan for each task in this WA, specifying clearly the technical and functional basis for the new version:

- The minimum design characteristics of the new software
- A workflow describing the expected inputs and outputs of each new program algorithm, including example use cases.
- Desired behavior of the graphical user interface, including sketches of windows, location of hover text, etc.
- Protocol for quality assurance of each new feature.
- Sequence in which the Contractor will address the tasks below.

The Contractor shall not modify the source code until the WAM approves this project plan. The Contractor shall develop the system design document for each new BenMAP-CE feature on a rolling basis and in consultation with the Work Assignment Manager.

Deliverables:

1.1. Work plan
1.2. System design document

Task #2: Procure, Format, and Incorporate into BenMAP-CE Baseline Hospital Admission and Emergency Department Visit Rates from the Healthcare Cost and Utilization Project.

Task 2.a: Procure the data

The Contractor shall procure the county-level hospital admission and emergency department visit from the U.S. Department of Health & Human Services' Agency for Healthcare Cost and Utilization Project's Healthcare Cost and Utilization Project (HCUP). The Contractor shall purchase these county-level data:

- For each state participating in the HCUP program
- For the most recent single year available

The Contractor shall procure these data on behalf of the U.S. Government and thus will pay the non-profit or Federal Agency fee. The attached excel spreadsheet provides additional details regarding costs and participating states.

Task 2.b: Format, import and quality-assure the input data

The Contractor shall calculate baseline hospital and emergency department visit rates according to the following specifications:

- Rates shall be calculated as per person per year, where the population used to calculate each rate will match the year of this hospital and emergency department visit data.
- The Contractor shall calculate rates for each health endpoint and age range defined in BenMAP-CE v1.3 as well as additional endpoints specified by the WA-COR.
- Among those states for which the HCUP data are not available, the Contractor shall substitute a rate calculated from neighboring states.

Task 2.c: Incorporate rates into BenMAP-CE

Having formatted the hospital admission and emergency department visit rates, the Contractor shall:

- Develop BenMAP-CE-ready input files.
- Import these new rates to BenMAP-CE v1.3.

- Perform a series of sensitivity analyses comparing the number of estimated hospital and emergency department visits calculated using these newly updated rates as compared to the existing HCUP rates calculated using 2007 data.
- Update the user manual technical appendices to reflect the source of these new data and the states for which the county-level rates are available.

Deliverables:
2.1 Procure data
2.2 Format, import and quality assure input data
2.3 Incorporate new data into BenMAP-CE and perform sensitivity testing

Task #3: Modify BenMAP-CE to Enable Users to Assign Health Impact Functions to Discrete Geographic Areas

The Contractor shall modify the BenMAP-CE program so that users can apply a health impact function to a discrete geographic location—for example, a region, state or county. The Contractor shall modify BenMAP-CE so that it:

- Allows users to assign a function to a specific geographic area within either the function editor or "on the fly" using the BenMAP-CE GIS.
- Estimates health impacts only for each location to which that health impact function is assigned.
- Can import a user-provided spreadsheet of health impact functions assigned to discrete geographic areas
- Reports clearly the health impact estimates in the report window and GIS for each geographic area.

The Contractor shall reference closely the system design document and consult regularly with the WA-COR. The Contractor shall perform one or more test cases to be reviewed by the WA-COR.

The Contractor shall not modify the source code until the WAM approves this project plan.

Deliverables:
3.1 Draft location-specific health impact function feature
3.2 Final location-specific health impact function feature
3.3 Document changes to user interface and new algorithms in the user manual

VI. REPORTING REQUIREMENTS:

All reports shall be in accordance with contract specifications. The Contractor shall submit work products in electronic as well as hard copy form. In addition, the Contractor shall deliver to the WAM each draft and final report in electronic format that is readable by OAQPS's windows-based word-processing (Microsoft Word 2007), graphics (Microsoft PowerPoint 2007), spreadsheet (Excel 2007), and database (Access 2007) programs.

VII. QA Requirements:

The Contractor shall include a quality assurance section in the final report discussing the data used with respect to precision, accuracy, representativeness, comparability, completeness, sensitivity and appropriateness as it applies to this use and its source. The QA section shall discuss how the Contractor ensured that the environmental data were of acceptable quality and that they were being used for the purpose for which they were collected.

VIII. DELIVERABLES:

The Contractor shall adhere to the following schedule:

Task	Deliverable	Delivery Schedule
1	Cost estimate	20 days after effective date of WA
2a	Procure data	1 months after effective date of WA
2b	Create input files	2 months after effective date of WA
2c	Incorporate rates into BenMAP-CE	3 months after effective date of WA
3	Modified version of BenMAP-CE allowing users to assign effect coefficients to locations	6 months after effective date of WA