

Populations, Activity and Emissions of Diesel Nonroad Equipment in EPA Region 7

Proposed Data Tables and Formats Appendix H

Assessment and Standards Division
Office of Transportation and Air Quality
U.S. Environmental Protection Agency

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Statement of Work

Statement of Work APPENDIX H

Proposed Data Tables and Formats

This Appendix contains proposed data formats for the tables listed in Table 9 of the Statement of Work, which is also reproduced here. The formats include Field Descriptors, suggested field names, and suggested formats. Several translation tables follow the data tables. The translation tables define the values of coded variables used in the data tables.

Table 9 Tentative Data Structure for the Nonroad Pilot Data Collection

Table Description	Table Name	Primary Key(s)	Unique Records	Records/ respondent	Parent Table
Equipment Ownership Interview Results	eqtOwnIview	respondent ID	2,080	1	---
On-site Equipment Inventory, Interview Portion	eqtInvIview	respondent ID	2,080	1	eqtOwnIview
On-site Equipment Inventory, Site-list Portion	eqtInvSiteList	respondent ID, siteNum	540	1 to many	eqtInvIview
On-site Equipment Inventory, Equipment List Portion	eqtInvEqtList	respID, siteNum, pieceNum	540	1 to many	eqtInvSiteList
Equipment Identification, Description and Instrumentation Parameters	eqtInstParam	pieceID	540	1	eqtInvEqtList
Output file containing activity data collected by PAMS	eqtActivity	respID pieceID (vehicle SSN)	540	1 to many	eqtInstParam
Output files containing emissions data collected by PEMS	e<respID>_<pieceID>. <extension>	respID pieceID	thousands	1 to many	eqtInstParam

Data Table Description: Results from the Equipment Ownership Interview (eqtOwnIview)

Field Description	Field Name	Field format
Respondent's ID Code (Primary Key)	respID	character(10)
Sample Identifier (Establishment or Equipment sample)	sample	numeric(2.0)
Respondent's selection probability (2 nd stage)	pSSU	numeric(10.8)
Date interview completed	dateCompleted	character(8), mmddyyyy
Interviewer ID Code	iwerID	character(10)
Respondent's 3-4 digit NAICS Code	respNAICS	numeric(4.0) (integer)
Respondent's PSU (County FIPS)	respFIPS	numeric(5.0) (integer)
Respondent's Incentive Group	respIncentiveGrp	numeric(2.0)
Interview Mode	iviewMode	numeric(2.0)
Interview Final Result Code	iwFinal	numeric(3.0)
Establishment measure of size (MOS) from sample frame	frameMOS	numeric(10.)
Beginning time for interview	timebeg	time(00:00)
Q2: verify respondents business activity (NAICS category)	Q2isNAICSAccurate	numeric(2.0)
Q3: Respondent's self-reported business activity	Q3businAct	character(250)
Q4: Respondent's self-reported employer status (GPI)	Q4isEmployer	numeric(2.0)
Q4: Respondent's self-reported farm status (Agriculture)	Q4isFarm	numeric(2.0)
Q5: Respondent's self-reported number of employees	Q5numEmpl	numeric(8.0)
Q5: Respondent's self-reported farm acreage	Q5farmAcres	numeric(8.0)
Q6: Respondent's self-reported MOS Class (no. employees, GPI)	Q6numEmplCls	numeric(2.0)
Q6: Respondent's self-reported MOS Class (farm acreage, Agriculture)	Q6acresCls	numeric(2.0)
Q7: Respondent's diesel equipment usage	Q7useDslEq	numeric(2.0)
Q8: No. Equipment pieces used	Q8numEq	numeric(8.0)
Q9: Respondent's self-classification: no. equipment pieces	Q9numEqCls	
Q10: Eligibility for Emissions Measurement	Q10eligibilityPEMS	numeric(2.0)
Ending time for interview	timeend	time(00:00)

Data Table Description: Interview Portion of the On-site Equipment Inventory (eqtInvInterview)

Field Description	Field Name	Field format
Respondent's ID Code (Primary Key)	respID	character(10)
Date Inventory Completed	dateCompleted	character(8), mmddyyyy
Inventory Final Outcome Code	invFinal	numeric(8)
Beginning time for inventory	timebeg	time(xx:xx)
Q1: Respondent's work sites (binary)	Q1hasMultSites	numeric(4)
Q2: No. work sites with nonroad equipment	Q2numSites	numeric(4)
Q3: contact at remote site (binary)	Q3hasSiteContact	numeric(4)
Q6: Respondent's shift schedule (binary)	Q6hasShifts	numeric(4)
Q7: Number of shifts per 24-hour period	Q7shiftsPer24	numeric(4)
Q8: Respondent's consent to instrument selected piece	Q8respOK	numeric(4)
Q9: Annual vs. Periodic Usage?	Q9annualPerUsage	numeric(4)
Q10: Usage by Month	Q10_1	numeric(4)
	Q10_2	numeric(4)
	Q10_3	numeric(4)
	Q10_4	numeric(4)
	Q10_5	numeric(4)
	Q10_6	numeric(4)
	Q10_7	numeric(4)
	Q10_8	numeric(4)
	Q10_9	numeric(4)
	Q10_10	numeric(4)
	Q10_11	numeric(4)
	Q10_12	numeric(4)
Q11: Use during measurement period	Q11useMeasPer	numeric(4)
Ending time for Inventory	timeend	time(xx:xx)

Data Table Description: Site List Portion of the On-site Equipment Inventory (eqtInvSiteList)

Field Description	Field Name	Field format
Respondent's ID Code (Primary Key)	respID	character(10)
Site Number	siteNum	numeric(4)
Site code	siteCode	numeric(2)
Distance Code	distCode	numeric(2)
Equipment shift code	eqtShiftCode	numeric(2)
Shift Selection Code	shiftSelectCode	numeric(2)
Site Description	siteDesc	character(250)
Was site selected?	wasSiteSelected	numeric(2)
Site Selection Probability (SRS)	pSite (=1/Q2numSites)	numeric(10.8) (real)

Data Table Description: Equipment-List Portion of the On-site Equipment Inventory (eqtInvEqtList)

Field Description	Field Name	Field format
Respondent's ID Code (Primary Key)	respID	character(10)
Site Number (Primary Key)	siteNum	numeric(4)
Shift Selection Code	shiftSelectCode	numeric(2)
Piece number	eqtPcNum	numeric(8)
Equipment type code	eqtType	numeric(4)
Equipment type description	eqtTypeDesc	character(50)
Equipment manufacturer	eqtMfr	character(25)
Equipment model	eqtModel	character(25)
Equipment model year	eqtModelYr	numeric(4)
Equipment serial number	eqtSerialNum	character(20)
Is piece eligible for emissions measurement?	isEligible	numeric(2)
Was piece selected for measurement?	isSelected	numeric(2)
Piece's selection probability (SRS)	pPiece	numeric(10.8) (real)
Comments	comments	character(250)

Data Table Description: Equipment Identification, Description and Instrumentation Parameters
(eqtInstParam)

Field Description	Field Name	Field format
Respondent's ID Code (Primary Key)	respID	character(10)
Piece number	eqtPcNum	numeric(8)
Equipment serial number	eqtSerialNum	character(20)
Number of respondent's sites	numSites	numeric(4)
Number of work shifts	numShifts	numeric(4)
Number of eligible pieces on selected site	numPieces	numeric(8)
Equipment type code	eqtType	numeric(4)
Equipment type description	eqtTypeDesc	character(50)
Equipment manufacturer	eqtMfr	character(25)
Equipment model	eqtModel	character(25)
Equipment model year	eqtModelYr	numeric(4)
Equipment plate code	eqtPlateCode	numeric(2)
Equipment comments	eqtComments	character(250)
Engine manufacturer	engMfr	character(20)
Engine model	engModel	character(20)
Engine model year	engModelYr	numeric(4)
Engine serial number	engSerialNum	character(20)
Engine family	engFamily	character(20)
Engine plate code	engPlateCode	numeric(2)
Engine comments	engComments	character(250)
Hour-meter function code 1	hrMeterCode1	numeric(2)
Hour-meter function code 2	hrMeterCode2	numeric(2)
Beginning date for current hour-meter reading	hrMeterBegDate	character(8)(mmddyyyy)
Hour-meter reading	hrMeterReading	numeric(10.8)
Hour-meter comments	hrMeterComments	character(250)
Are major exhaust leaks present?	isExhLeak	numeric(2)
Is alternator speed signal reliable?	isAltSignal	numeric(2)
Are modifications or malmaintenance evident?	isModMal	numeric(2)

Visual Inspection Comments	visInspectComm	character(250)
Installation date	installDate	character(8) mmddyyyy
Removal date	removeDate	
Installation time	installTime	time(hh:mm)
Removal time	removeTime	time(hh:mm)
Installation Comments	installComments	character(250)
Removal Comments	removeComments	character(250)
Engine rated power: value	engRatePwr	numeric(10.8)
Engine rated power: units	engRatePwrUnits	numeric(2)
Engine rated power: source code	engRatePwrSrce	numeric(2)
Engine rated power: method code	engRatePwrMeth	numeric(2)
Engine rated speed: value	engRateSpd	numeric(10.8)
Engine rated speed: source code	engRateSpdSrce	numeric(2)
Engine rated speed: method code	engRateSpdMeth	numeric(2)
Engine peak torque: value	engPeakTorq	numeric(10.8)
Engine peak torque: units	engPeakTorqUnits	numeric(2)
Engine peak torque: source code	engPeakTorqSrce	numeric(2)
Engine peak torque: method code	engPeakTorqMeth	numeric(2)
Engine peak speed: value	engPeakSpd	numeric(10.8)
Engine peak speed: units	engPeakSpdUnits	numeric(2)
Engine peak speed: source code	engPeakSpdSrce	numeric(2)
Engine peak speed: method code	engPeakSpdMeth	numeric(2)
Engine rating: Comments	engRateComm	character(250)
Is after-treatment present?	isAfterTreat	numeric(2)
Description of after-treatment technology	afterTreatDesc	character(250)
Unit power (volts)	unitPower	numeric(10.8)
Tailpipe outer diameter (inches)	tailpipeOD	numeric(10.8)
Tailpipe wall thickness (inches)	tailpipeID	numeric(10.8)
Instrument Code	instCode	numeric(2)
Box Number	spotBoxNum	character(8)
Datalogger ID	spotDataLoggerID	character(8)
Flowmeter ID	spotFlowMeterID	character(8)

Nox/O2 sensor ID	spotNOxO2SensorID	character(15)
Cell number	spotCellNum	character(12)
Precalibration: calibration ID number	preCalID	character(8)
Precalibration: calibration date	preCalDate	character(8) mmddyyyy
Precalibration: flow-meter, 0 th order term	preCalFlow_0	numeric(10.8)
Precalibration: flow-meter, 1 st order term	preCalFlow_1	numeric(10.8)
Precalibration: flow-meter, 2 nd order term	preCalFlow_2	numeric(10.8)
Precalibration: flow-meter, 3 rd order term	preCalFlow_3	numeric(10.8)
Precalibration: NOx conc., 0 th order term	preCalNOx_0	numeric(10.8)
Precalibration: NOx conc., 1 st order term	preCalNOx_1	numeric(10.8)
Precalibration: NOx conc., 2 nd order term	preCalNOx_2	numeric(10.8)
Precalibration: NOx conc., 3 rd order term	preCalNOx_3	numeric(10.8)
Precalibration: O ₂ conc., 0 th order term	preCalO2_0	numeric(10.8)
Precalibration: O ₂ conc., 1 st order term	preCalO2_1	numeric(10.8)
Precalibration: O ₂ conc., 2 nd order term	preCalO2_2	numeric(10.8)
Precalibration: O ₂ conc., 3 rd order term	preCalO2_3	numeric(10.8)
Precalibration: COconc., 0 th order term	preCalCO_0	numeric(10.8)
Precalibration: COconc., 1 st order term	preCalCO_1	numeric(10.8)
Precalibration: COconc., 2 nd order term	preCalCO_2	numeric(10.8)
Precalibration: COconc., 3 rd order term	preCalCO_3	numeric(10.8)
Precalibration: THCconc., 0 th order term	preCalTHC_0	numeric(10.8)
Precalibration: THCconc., 1 st order term	preCalTHC_1	numeric(10.8)
Precalibration: THCconc., 2 nd order term	preCalTHC_2	numeric(10.8)
Precalibration: THCconc., 3 rd order term	preCalTHC_3	numeric(10.8)
Postcalibration: calibration ID number	postCalID	character(8)
Postcalibration: calibration date	postCalDate	character(8) mmddyyyy
Postcalibration: flow-meter, 0 th order term	postCalFlow_0	numeric(10.8)
Postcalibration: flow-meter, 1 st order term	postCalFlow_1	numeric(10.8)
Postcalibration: flow-meter, 2 nd order term	postCalFlow_2	numeric(10.8)
Postcalibration: flow-meter, 3 rd order term	postCalFlow_3	numeric(10.8)
Postcalibration: NOx conc., 0 th order term	postCalNOx_0	numeric(10.8)
Postcalibration: NOx conc., 1 st order term	postCalNOx_1	numeric(10.8)

Postcalibration: NOx conc., 2 nd order term	postCalNOx_2	numeric(10.8)
Postcalibration: NOx conc., 3 rd order term	postCalNOx_3	numeric(10.8)
Postcalibration: O ₂ conc., 0 th order term	preCalO2_0	numeric(10.8)
Postcalibration: O ₂ conc., 1 st order term	postCalO2_1	numeric(10.8)
Postcalibration: O ₂ conc., 2 nd order term	postCalO2_2	numeric(10.8)
Postcalibration: O ₂ conc., 3 rd order term	postCalO2_3	numeric(10.8)
Postcalibration: COconc., 0 th order term	postCalCO_0	numeric(10.8)
Postcalibration: COconc., 1 st order term	postCalCO_1	numeric(10.8)
Postcalibration: COconc., 2 nd order term	postCalCO_2	numeric(10.8)
Postcalibration: COconc., 3 rd order term	postCalCO_3	numeric(10.8)
Postcalibration: THCconc., 0 th order term	postCalTHC_0	numeric(10.8)
Postcalibration: THC conc., 1 st order term	postCalTHC_1	numeric(10.8)
Postcalibration: THC conc., 2 nd order term	postCalTHC_2	numeric(10.8)
Postcalibration: THC conc., 3 rd order term	postCalTHC_3	numeric(10.8)
Date of site-visit (for maintenance during use)	visitDate	character(10) mmddyyyy
Time of site visit (for maintenance during use)	visitTime	time (hh:mm)
Reason for site visit	visitReason	character(250)
Actions taken during site visit	visitActions	character(250)
Outcome code for site visit	visitOutcome	numeric(2)

Translation Table: Final Interview Result Codes for the Equipment Ownership Interview
(resultEqtOwnIview)

Field Outcome Description	Code
Interview completed successfully	40
Refusal	41
Break off (partial interview)	42
Knowledgeable respondent unavailable after repeated callbacks	43
Intended respondent not at listed phone number	44
Language barrier	45
Other (specify in comments)	46

Translation Table: Final Result Codes for the On-site Equipment Inventory
(resultEqtInv)

Field Outcome Description	Code
Inventory complete (home site)	80
Inventory complete (remote site)	81
Break off (partial inventory)	82
Knowledgeable respondent unavailable after repeated visits	83
Intended respondent not at listed address	84
Refusal	85
Language barrier	86
Other (specify in comments)	87

Translation Table: Final Result Codes for the On-site Equipment Inventory SiteList and Description
(resultSiteList)

Field Outcome Description	Code
<u>Site Codes</u>	
Primary Site	01
Secondary Site (Remote)	02
<u>Distance Codes</u>	
# <i>travelDistance</i>	10
> <i>travelDistance</i>	11
<u>Equipment Shift Codes</u>	
One shift per 24-hour period (1/24-hr)	20
Two shifts per 24-hour period (2/24-hr)	21
Three shifts per 24-hour period (3/24-hr)	22
Other (Describe in comments)	23
<u>Shift Selection Codes</u>	
Day shift	30
Swing shift	31
Graveyard or night shift	32
Other (Describe in comments)	33

Translation Table: Codes for the Identification, Description and Installation Parameters
(resultEqInst)

Field Outcome Description	Code
<u>Equipment Plate Codes</u>	
Not present	01
Cannot Locate	02
Present but specs not legible	03
Present and legible	04
Other	05
<u>Engine Plate Codes</u>	
Not present	01

Cannot Locate	02
Present but specs not legible	03
Present and legible	04
Other	05
<u>Hour-meter function Code 1</u>	
Meter not present	21
Meter present but not functioning	22
Original meter, reading presumed to represent hours since original purchase	23
Original meter reset following maintenance or resale, can identify beginning date for current reading	24
Original meter reset following maintenance or resale, CANNOT identify beginning date for current reading	25
NOT original meter, can identify beginning date for current reading	26
NOT original meter, CANNOT identify beginning date for current reading	27
Other: (describe in hour-meter comments)	28
<u>Hour-meter function code 2</u>	
No reading available	30
Current reading presumed accurate	31
Current reading not accurate, reliable adjustment possible (describe in hour-meter comments)	32
Current reading not accurate, reliable adjustment NOT possible (describe in hour-meter comments)	33
Other (describe in hour-meter comments)	34
<u>Engine Rating Units Codes</u>	
Horsepower (gross)	11
Horsepower (net)	12
Kilowatts (gross)	13
Kilowatts (net)	14
Foot-lbs (ft-lb)	15
Newton-meters (nm)	16
Other (describe)	17
<u>Engine Rating Source Codes</u>	
Owner's/User's verbal report	21
Engine plate	22
Manufacturer's specification	23
Reference source	24
Unavailable	25
Other (describe)	26

Engine Rating Method Codes

NETT SAE	31
ISO	32
Unknown	33
Unavailable	34
Other (describe)	35

Portable Instrument Codes

Portable Activity Measurement System (PAMS)	01
Simple Portable On-vehicle Measurement (SPOT)	02
Sensors Emission Technology - Diesel (SEMTECH-D)	03
Other	04

Site-visit/Maintenance Outcome Codes

Instrument retained, data prior to visit invalid	10
Instrument retained, data prior to visit valid	11
Instrument replaced, data prior to visit invalid	20
Instrument replaced, data prior to visit valid	21
Instrument not replaced, data prior to visit invalid	30
Instrument not replaced, data prior to visit valid	31
