Plan Overview

A Data Management Plan created using DMPTool

DMP ID: https://doi.org/10.48321/D1QS59

Title: Detection of Airplane Cabin Air Quality Events from Engine Bleed Air Contaminants

Creator: Susan Jay - **ORCID:** 0000-0002-1331-0396

Affiliation: United States Department of Transportation (DOT) (transportation.gov)

Principal Investigator: Byron Jones, Richard Fox, Steven Eckels

Data Manager: Steven Eckels

Funder: United States Department of Transportation (DOT) (transportation.gov)

Template: U.S. Department of Transportation: Data Management Plan (DMP)

Project abstract:

The purpose of this multi-year, multi-phase airplane cabin air quality research study is to (1) identify and measure levels of engine and auxiliary power unit bleed air contaminants, (2) identify sensor technologies to detect/provide warning(s) of bleed air contaminant events, (3) identify techniques to minimize airplane diversions from smoke, odor, fume events, and (4) assess potential health-related risks of human exposure (i.e., passengers and flight/cabin crew) to chemicals generated during contaminated air events.

Phase 1 work will assess the current state of knowledge of engine bleed air/cabin air contamination events and evaluate the current state of sensor technologies that could be used to detect airplane engine bleed air/cabin air contaminants. Phase 2 work will involve static aircraft engine stand tests and ground-based, on-aircraft tests. Phase 2 tests will assess the capability of current, commercial off-the-shelf sensors to detect bleed air contaminants resulting from engine oil, hydraulic fluid, and deicing fluid, and will also involve the collection and chemical analysis of engine bleed air contaminants resulting from engine oil, hydraulic fluid, and deicing fluid. Phase 3 work will involve the toxicological review and interpretation of the chemical sample data to examine the potential health-related risks of human exposure to engine bleed air contaminants resulting from engine oil, hydraulic fluid, and deicing fluid.

The overall study will produce multiple data sets and technical reports on sensor technology performance, chemical analyses of engine bleed air contaminants, and a toxicological assessment of the potential health effects of engine bleed air contaminants on passenger and flight/cabin crew.

Start date: 06-30-2020

End date: 03-27-2024

Last modified: 05-10-2023

Copyright information:

Detection of Airplane Cabin Air Quality Events from Engine Bleed Air Contaminants

Persistent Link

Include the persistent identifier (PID) that is associated with the dataset.

Persistent Link: https://doi.org/10.21949/1524448

Recommended Citation

The recommendeded data citation to be used when citing the dataset.

Recommended Citation: TBD once overall project is completed; multi-volume collection of data sets and reports

Change Log

Document the changes that are made to the DMP, any and all changes should be noted to ensure a more complete documentation.

Change Log:
2021-12-30: Initial Data Management Plan (DMP) written

2023-02-10: FAA/CAMI updated DMP to encompass entire research project, not just the KSU-specific Phase 2 data collection activities (e.g., engine stand tests, ground-based, on-aircraft tests)

CONTENTS

Include a table of contents, in order to better organize the DMP.

CONTENTS:

0. Dataset and Contact Information
1. Data Description
2. Standards Employed
3. Access Policies
4. Re-Use, Redistribution, and Derivative Products Policies
5. Archiving and Preservation Plans

6. Policies Affecting this Data Management Plan

0. Dataset and Contact Information

Please provide the following information:

- Name of the dataset or project for which data is being collected
- Project number, contract number, or other number used to link this DMP
- Name of the person submitting this DMP -ORCiD of the person submitting this DMP
- Email and phone number of the person submitting this DMP
- Name of the organization for which the person submitting this DMP is working for
- Email and phone number for the organization
- Link to organization or project website
- Date the DMP was written

0. Dataset and Contact Information:

- Name of the dataset or project for which data is being collected -- Detection of Airplane Cabin Air Quality Events from Engine Bleed Air Contaminants
- Project number, contract number, or other number used to link this DMP -- TBD; multiple contracts and Interagency Agreements (IAAs)
- Name of the person submitting this DMP -ORCiD of the person submitting this DMP -- Susan M. Jay, ORCiD: 0000-0002-1331-0396
- Email and phone number of the person submitting this DMP - susan.m.jay@faa.gov; (405) 954-5500
- Name of the organization for which the person submitting this DMP is working for -- Performing Organization: Civil Aerospace Medical Institute (CAMI)
- Email and phone number for the organization -- Mailing Address: Civil Aerospace Medical Institute (CAMI) P.O. Box 25082 Oklahoma City, OK United States 73125
- Link to organization or project website -- https://www.faa.gov/about/office_org/headquarters_offices/avs/offices/aam/cami
- Date the DMP was written -- 30 December 2021

1. Data Description

Name the data, data collection project, or data producing program.

1. Data Description: These data sets and technical reports are derived from the research project "Detection of Airplane Cabin Air Quality Events from Engine Bleed Air Contaminants"

Describe the purpose of your research.

The FAA Reauthorization Act of 2018 (Congress, 2018), Section 326, Aircraft Air Quality, subsection (C)(1), directed the Federal Aviation Administration to commission an airplane cabin air quality study. In response to the Congressional mandate, the FAA initiated a multi-year, multi-phase research project with several academic and Department of the Navy research partners (Kansas State University, Boise State University, Naval Air Warfare Center Aircraft Division, Naval Medical Research Unit - Dayton).

The purpose of this multi-year, multi-phase airplane cabin air quality research study is to (1) identify and measure levels of engine and auxiliary power unit bleed air contaminants, (2) identify sensor technologies to detect/provide warning(s) of bleed air contaminant events, (3) identify techniques to minimize airplane diversions from smoke, odor, fume events, and (4) assess potential health-related risks of human exposure (i.e., passengers and flight/cabin crew) to chemicals generated during contaminated air events.

Describe the data that will be generated in terms of nature and scale (e.g., numerical data, image data, text sequences, video, audio, database, modeling data, source code, etc.).

Over the course of this project, two or more sets of extensive experiments will be conducted using a test stand turbine engine and an operational, ground-based airliner aircraft. Controlled amounts of various engine oils, hydraulic fluids, and deicing fluids will be ingested or injected into engine compressors and the resulting contaminants and marker substances in the engine bleed air under various operating conditions will be measured. In the case of the ground-based aircraft, measurements will be collected at multiple points in the aircraft bleed air and environmental control system. Multiple real time instruments/sensors (10-20) will detect substances present in the bleed air. Additionally, bleed air samples will be collected for laboratory analysis. Each set of experiments will extend over a period of approximately five days with multiple conditions examined each day. Some instruments will be operated by the research team and some instruments will be operated by the instrument manufacturer. Additional limited engine experiments of a similar nature may be conducted at other times during the project. Also, experiments may be conducted using a furnace to heat samples of the engine oils, hydraulic fluids, and deicing fluids with similar measurements.

For each real time instrument, the data recording and storage process will go through four steps:

1. Raw Data: Data collected and recorded in real time by the instrument. In some cases, this data is in a proprietary format and is decipherable only through proprietary software associated with the instrument. In other cases, it is recorded in a readily deciphered format (e.g., ASCII comma delimited).
2. Reduced Data: All data will be converted to Excel Worksheet format. The raw data converted to this format are considered reduced data.
3. Cleaned Data: Cleaned data are data that have been reviewed and erroneous or otherwise bad data removed (e.g., instrument malfunction). Cleaned data are considered valid for further analysis regarding outcome of the experiment.
4. Archive Data: Archive data are cleaned data that are considered relevant for documentation of experimental results. In general, most cleaned data are considered archive data unless there is some

reason to omit them. For example, an experiment during which there was inadequate control of the operating conditions may not meet the standards of archived data.

Samples collected for laboratory analysis will be sent to appropriate chemical laboratories. These results will be returned to the research team in tabular form and the format of the reporting is generally determined by the laboratory. For the chemical sample data the recording and storage process is somewhat similar; however, it is only a three-step process. The reports as received will be considered reduced data in the scheme described above, and will be used to generate cleaned data and archive data. The various reports may or may not be combined. Data will remain in written tabular form.

Describe methods for creating the data (e.g., simulated; observed; experimental; software; physical collections; sensors; satellite; enforcement activities; researcher-generated databases, tables, and/or spreadsheets; instrument generated digital data output such as images and video; etc).

The methods used for creating the data will include sensor instruments, chemical sampling techniques (e.g., summa canisters, sorbent tubes, cartridges, etc.), commercial laboratory chemical analysis reports, and researcher-generated databases, tables, and spreadsheets.

Discuss the period of time data will be collected and frequency of update.

Data collection for the Phase 2 engine stand tests was completed 16 - 20 MAY 2022; this was a one-time data collection effort. Data collection for the Phase 2 ground-based, on-aircraft tests is scheduled for 15 - 26 MAY 2023; this too is a one-time data collection effort.

If using existing data, describe the relationship between the data you are collecting and existing data.

The lead researchers and research partners are not using existing data for the current research project.

List potential users of the data.

Potential users of this data include regulatory agencies (e.g., the FAA, EASA), airplane manufacturers, sensor instrument manufacturers, air carriers, airline pilot and flight attendant unions, academic institutions, and the public.

Discuss the potential value of the data have over the long-term for not only your institution, but also for the public.

The potential long-term value of the data will allow regulatory agencies (e.g., the FAA, EASA) to determine the capability and feasibility of using sensors to detect bleed air contamination events, and will provide information to sensor manufacturers to design engine bleed air detection systems. The toxicological review and interpretation of the chemical sampling data will inform regulatory agencies (e.g., the FAA, EASA, OSHA), pilot and flight attendant unions, and the public on the potential health-related risks of human

exposure to chemicals generated during contaminated air incidents.

If you request permission not to make data publicly accessible, explain rationale for lack of public access.

These data will be made publicly available through the National Transportation Library, as well as through links on the FAA's William J. Hughes Technical Center and Civil Aerospace Medical Institute (CAMI) websites

Indicate the party responsible for managing the data.

Kansas State University (KSU), in collaboration with the FAA, is responsible for data management during the data collection and data analysis phases. Once the research project is complete, KSU will release the data to the FAA who in turn will send the complete data sets and technical reports to the National Transportation Library for permanent, long-term storage and public access.

Describe how you will check for adherence to this data management plan.

Adherence to this data mangement plan (DMP) will be reviewed at least once per quarter.

2. Standards Employed

List in what format(s) the data will be collected. Indicate if they are open or proprietary.

2. Standards Employed:

Most real time sensor instruments record data in an instrument specific format defined by the software associated with each instrument (i.e., raw data). Some sensor instruments record the raw data using proprietary software. At the earliest reasonable opportunity, these data will be converted into Excel spreadsheets with data recorded in columnar format in temporal order (i.e., reduced data). One column will be time of day and so labelled. Where multiple data are recorded in a single spreadsheet, each column will be appropriately labeled to identify the sensor and variable for that column. Units will be included in the label for each column.

The chemical sample data will be reported in tabular and/or laboratory report formats that are the "industry standard" for commercial laboratories and thus are considered "open" formats.

If you are using proprietary data formats, discuss your rationale for using those standards and formats.

Some sensor instruments record raw data in a format that is only readable by the manufacturer's proprietary

software. Recording in this format is the only option for these instruments. However, after data collection, this software can be used to create files in other formats and will be used to convert the data into Excel Spreadsheet format.

The chemical sample data all use "open reporting" formats.

Describe how versions of data be signified and/or controlled.

During the data collection and data analysis phases, electronic data files/versions will be maintained by Kansas State University (KSU; lead academic institution) on a electronic, password secured website, accessible by invitation-only to the researchers, research partners, and select FAA personnel (e.g., project manager).

There will be up to four versions of real time sensor instrument data and up to three versions of laboratory analysis data. The master data repository will be divided into four main folders, one for each of these versions. Within each main folder, there will be a folder for each sensor instrument. This folder may be further divided into additional sub-folders for different experiments as appropriate. As data are reviewed and cleaned, new files will be created for the next higher category (e.g., from raw data to reduced data). Old files will not be discarded, but will remain in the lower category folder.

Once the research project is complete, electronic files, data sets, and technical reports will be retained on secured government furnished equipment at the National Transportation Library.

If the file format(s) you are using is(are) not standard to your field, describe how you will document the alternative you are using.

The only non-standard formats used will be those associated with sensor instrument recorded raw data. The manufacturer provided software will be used to convert the data into standard formats and thus no documentation of non-standard formats is needed.

The file format(s) for the chemical sample data are standard for that industry/field.

List what documentation you will be creating in order to make the data understandable by other researchers.

A text "README" file will be created for each sensor instrument that describes the generated data and the spreadsheet format associated with that instrument. A "README" text file will be included in each sensor instrument folder.

A detailed log will be maintained for each experiment which will document start times, end times, and experimental conditions (e.g., contaminant injection rate, bleed air temperature, etc.). There will be a

separate sub-folder for these logs, which will be accessible to all participants in the experiments. During experiments, an operator will be assigned to each instrument. One person may operate more than one instrument. The instrument operator will be responsible for maintaining a log that specifies the air source (e.g., inlet air, bleed air) that is being measured at each time during an experiment and any information about instrument settings and operation that may be needed to interpret the recorded data. This log will be included as a separate file in the "Reduced Data" folder for that instrument and will be carried forward to the higher level folders for that instrument as the folders are generated.

A "Master Key" spreadsheet will accompany the data set(s) and laboratory reports for each class of chemical sample data (e.g., volatile organic compounds [VOCs], aldehydes and ketones, polycyclic aromatic compounds [PAHs], etc.). The Master Key will include information pertaining to data/time of chemical sample collection, experimental conditions (e.g., air flow rate, air volume, contaminant concentrations, etc.), and how the data were collated and sorted for review and interpretation.

Indicate what metadata schema you are using to describe the data. If the metadata schema is not one standard for your field, discuss your rationale for using that scheme.

 The overall research project metadata schema is as follows:

Phase 1 *(assess the current state of knowledge of engine bleed air/cabin air contamination events, sensor technologies to detect airplane engine bleed air/cabin air contaminants)* -- literature review, Working Group Seminar summaries, and final technical report with recommendations.

Phase 2 *(engine stand tests and ground-based, on-aircraft tests)*

- Volume 1 -- engine stand tests; sensor instrument and chemical sample datasets, results, final technical report with recommendations.
- Volume 2 -- ground-based, on-aircraft tests; sensor instrument and chemical sample datasets, results, final technical report with recommendations.

Phase 3 *(assess potential health-related risks)* -- toxicological review and interpretation of chemical sample data from engine stand and on-aircraft tests; chemical analysis results, laboratory reports, data sets, and final technical report with recommendations.

Describe how will the metadata be managed and stored.

The FAA is responsible overall metadata management throughout the entirety of the research project.

During the data collection and data analysis phases, the metadata will be maintained and stored by Kansas State University (KSU; lead academic institution) on a electronic, password secured website, accessible by invitation-only to the researchers, research partners, and select FAA personnel (e.g., project manager).

Once the research project is complete, electronic files, data sets, and technical reports will be retained on secured government furnished equipment at the National Transportation Library.

Indicate what tools or software is required to read or view the data.

A computer, or other internet-connected electronic device, with Microsoft Office applications (e.g., Word, Excel) and Adobe PDF Reader will be required to access the data sets and technical reports.

Describe your quality control measures.

The Federal Aviation Administration (FAA) will ensure the final datasets and technical reports are maintained and retained on government furnished equipment in accordance with Department of Transportation (DOT) and FAA data accessibility policies. The Kansas State University Data Manager and the FAA's Research Project Manager will ensure that the electronic files open and have retained the entered data.

3. Access Policies

Describe what data will be publicly shared, how data files will be shared, and how others will access them.

3. Access Policies:

The intent in this project is to generate data that can be shared with the public. Any data placed in the Kansas State University (KSU) Archive Data folder may be shared with the Federal Aviation Administration (FAA) and research partners. The FAA, in turn, will make the final datasets and technical reports accessible to the public via the National Transportation Library.

Most of the data collected during the experiments will have no restrictions. A representative from the sensor instrument manufacturer may operate some instruments during the experiments. Some sensor instruments may be operated by research team members, but may record data to the cloud and require the sensor manufacturer to retrieve and download the data. Some instruments operated by research team members may internally record data from individual sensors that are not normally available to the operator, but the sensor manufacturer may make these data available to the research team. In all of these cases, there must be at least a formal, written agreement between KSU and the sensor manufacturer in place prior to each experiment as to what data can and cannot be shared with the FAA and, ultimately, with the public. If the data that can be shared with the FAA for a specific sensor instrument is insufficient to evaluate instrument performance, then the instrument may be excluded from the experiment regardless of what other data it may generate.

The data generated from laboratory analysis of air samples will have no restrictions associated with it. All data release outside the research team and the FAA is subject to FAA approval.

All final datasets and technical reports will be made publicly available through the National Transportation Library, as well as through links on the FAA's William J. Hughes Technical Center and Civil Aerospace

Medical Institute (CAMI) websites

Indicate whether the data contain private or confidential information. If so:

- Discuss how will you guard against disclosure of identities and/or confidential business information.
- List what processes you will follow to provide informed consent to participants.
- State the party responsible for protecting the data.

The data contain no private or confidential information. Proprietary information concerning sensor instrument operation and/or software will be addressed by Non-Disclosure Agreements (NDAs) between Kansas State University (KSU) and individual sensor manufacturers.

Describe what, if any, privacy, ethical, or confidentiality concerns are raised due to data sharing.

The data do not raise any privacy, ethical, or confidentiality concerns.

If applicable, describe how you will deidentify your data before sharing. If not:

- Identify what restrictions on access and use you will place on the data.
- Discuss additional steps, if any you will use to protect privacy and confidentiality.

Non-applicable. There are no identification-related issues associated with these data (i.e., sensor instrument data, chemical sample data/laboratory reports).

4. Re-Use, Redistribution, and Derivative Products Policies

Name who has the right to manage the data.

4. Re-Use, Redistribution, and Derivative Products Policies:

These data are managed by the Department of Transportation, Federal Aviation Administration. The data are in the public domain and may be re-use without restriction. Citation of the data is appreciated. Please use the following recommended citations:

citations for each Phase of work TBD

Indicate who holds the intellectual property rights to the data.

The Federal Aviation Administration (FAA) holds the intellectual property rights to this data.

List any copyrights to the data. If so, indicate who owns them.

The data and technical reports are in the public domain.

Discuss any rights be transferred to a data archive.

Any rights to be transferred to a data archive are unknown at this time.

Describe how your data will be licensed for reuse, redistribution, and derivative products.

The data will be available to the public for reuse, redistribution, and the creation of derivative products in accordance with Department of Transportation and Federal Aviation Administration policy regarding U.S. government funded research products (i.e., the data are in the public domain and may be re-used without restriction, with source citation appreciated).

5. Archiving and Preservation Plans

Discuss how you intend to archive your data and where (include URL).

5. Archiving and Preservation Plans: Data archiving will be accomplished through the National Transportation Library.

Indicate the approximate time period between data collection and submission to the archive.

The time period from completion of data collection and analysis to archive submission is approximately 20 months (May 2023 to January 2025).

Final data collection (ground-based on-aircraft tests) is projected to be complete in May 2023. Ongoing analysis of sensor instrument data and chemical sample results from both the engine stand tests and on-aircraft tests is projected from June 2023 - May2025. Final report writing is projected from May - December 2024. The FAA's final report to Congress is due January, 2025.

Identify where data will be stored prior to being sent to an archive.

During the data collection and data analysis phases, the data will be temporarily stored by Kansas State University (KSU; lead academic institution) in a Microsoft OneDrive folder (with password-protected access) before being sent to the archive.

Describe how back-up, disaster recovery, off-site data storage, and other redundant storage strategies will be used to ensure the data's security and integrity.

A backup copy of the Kansas State University project root folder will be backed up via CrashPlan backup services.

Describe how data will be protected from accidental or malicious modification or deletion prior to receipt by the archive.

Access to the Kansas State University (KSU) data storage system will be limited to research team personnel,

research partners, and select FAA representatives (e.g., research project manager). Separate folders will be prepared for each participating sensor instrument company, which will include data only from that company's instrument(s). Participating companies will not have access to KSU's main research folders nor to the KSU root folder. All KSU main research folders will be automatically backed up via CrashPlan backup services.

Discuss your chosen data archive's policies and practices for back-up, disaster recovery, off-site data storage, and other redundant storage strategies to ensure the data's security and integrity for the long-term.

The data security and integrity will be maintained by the National Transportation Library (NTL) and the data management and protection will be subject to the standards and methodologies used by the NTL.

Indicate how long the chosen archive will retain the data.

The National Transportation Library will retain the data indefinitely.

Indicate if the chosen archive employs, or allows for the recording of, persistent identifiers linked to the data.

The National Transportation Library allows persistent identifiers to be linked to the data.

Discuss how your chosen data repository meets the criteria outlined on the [Guidelines for Evaluating Repositories for Conformance with the DOT Public Access Plan](#) **page.**

It is understood that the National Transportation Library complies with the following attributes:

1. Promotes an explicit mission of digital data archiving;
2. Ensures compliance with legal regulations, and maintains all applicable licenses covering data access and use, including, if applicable, mechanisms
    to protect privacy rights and maintain the confidentiality of respondents;
3. Has a documented plan for long-term preservation of its holdings;
4. Applies documented processes and procedures in managing data storage;
5. Performs archiving according to explicit work flows across the data life cycle;
6. Enables the users to discover and use the data, and refer to them in a persistent way through proper citation;
7. Enables reuse of data, ensuring appropriate formats and application of metadata;
8. Ensures the integrity and authenticity of the data;
9. Is adequately funded and staffed, and has a system of governance in place to support its mission; and
10. Possesses a technical infrastructure that explicitly supports the tasks and functions described in internationally accepted archival standards like Open Archival Information System (OAIS).

6. Policies Affecting this Data Management Plan

Include policies that the data management plan was created to meet, such as the DOT public access plan.

6. Policies Affecting this Data Management Plan:

This data management plan was created to meet the requirements enumerated in the U.S. Department of Transportation's "Plan to Increase Public Access to the Results of Federally-Funded Scientific Research" Version 1.1 << https://doi.org/10.21949/1520559 >> and guidelines suggested by the DOT Public Access website << https://doi.org/10.21949/1503647 >>, in effect and current as of December 30, 2021.

Planned Research Outputs

Data paper - "Aircraft Air Quality and Bleed Air Contamination Detection Phase 1: Current State of Knowledge of Engine Bleed Air/Cabin Air Contamination Events and Sensor Detection Technology"

Technical report describing the current state of knowledge of engine bleed air/cabin air contamination events and sensor detection technologies. Includes a literature review, Working Group Seminar summaries, and the final report with recommendations.

Dataset - "Phase 2 Engine Stand Tests Datasets"

Airplane engine test stand datasets to include sensor instrument data and analysis, and chemical sample data, laboratory results, and laboratory reports.

Data paper - "Aircraft Air Quality and Bleed Air Contamination Detection Phase 2, Volume 1: Engine Test Stand Sensor Instrument and Chemical Sample Data and Results"

Technical report describing the engine stand tests. Includes results, analyses, and recommendations based on sensor instrument and chemical sample data.

Dataset - "Phase 2 Ground-Based, On-Aircraft Tests Datasets"

Ground-based, on-aircraft tests datasets to include sensor instrument data and analysis, and chemical sample data, laboratory results, and laboratory reports.

Data paper - "Aircraft Air Quality and Bleed Air Contamination Detection Phase 2, Volume 2: Ground-Based, On-Aircraft Tests Sensor Instrument and Chemical Sample Data and Results"

Technical report describing the ground-based, on-aircraft tests. Includes results, analyses, and recommendations based on sensor instrument and chemical sample data.

Data paper - "Aircraft Air Quality and Bleed Air Contamination Detection Phase 3: Potential Health Risks of Human Exposure to Airplane Engine Bleed Air Contaminants"

Technical report with recommendations based on the toxicological review and interpretation of the chemical sample data, laboratory results, and laboratory reports from the engine stand tests and on-aircraft tests.

Planned research output details

Title	Type	Anticipated release date	Initial access level	Intended repository(ies)	Anticipated file size	License	Metadata standard(s)	May contain sensitive data?	May contain PII?
Aircraft Air Quality and Bleed Air Contamination D ...	Data paper	Unspecified	Open	None specified	9 MB	None specified	None specified	No	No
Phase 2 Engine Stand Tests Datasets	Dataset	Unspecified	Open	None specified	100 MB	None specified	None specified	No	No
Aircraft Air Quality and Bleed Air Contamination D ...	Data paper	Unspecified	Open	None specified	20 MB	None specified	None specified	No	No
Phase 2 Ground-Based, On-Aircraft Tests Datasets	Dataset	Unspecified	Open	None specified	100 MB	None specified	None specified	No	No
Aircraft Air Quality and Bleed Air Contamination D ...	Data paper	Unspecified	Open	None specified	50 MB	None specified	None specified	No	No
Aircraft Air Quality and Bleed Air Contamination D ...	Data paper	Unspecified	Open	None specified	50 MB	None specified	None specified	No	No