Michigan Statewide NG911 GIS Repository User Documentation

Department of Technology Management & Budget

Center for Shared Solutions

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Revision History

Version	Date	Author/Editor	Description	Change Summary
1.0	7/13/2022	Mark Holmes	Document creation	Essential Geometry Checks
2.0	7/25/2022	Timothy Lauxmann, Contributing authors Andrew Johnson & Mark Holmes	Document augmentation	Added Attribute Validation, Change Detection, Appendices

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Introduction

As a contributor to the NG911 GIS Repository, you will need to have a MiLogin account and request access to the Michigan Geographic Framework Data Gateway. Instructions for this process are provided in Appendix 1. Once you are granted access, an NG911 administrator will create your profile.

After your profile is set up, you will log into Michigan Geographic Framework Data Gateway via MiLogin to contribute your data to the NG911 GIS Repository. This guide is designed to take you through the steps required to prepare your centerline and address point data contributions into the repository.

How to Use this Guide

The guide is divided into three (3) sections that include:

1. Essential Geometry Validations

2. Attribute Validation

3. Change Detection

Each section presents detailed steps that will walk you through the process of preparing your data for contribution. Complete each section in the order presented in this guide. All sections must be completed for your data to upload successfully.

If you have questions or run into problems, consult the frequently asked questions in Appendix 2 or contact the NG911 GIS Helpdesk at DTMB-NG911GIS@michigan.gov.

Essential Geometry Validations

Starting a Submission – Essential Geometry Validations

To begin a submission, go to **My Assignments** (see Figure 1 below) and select **Essential Geometry Checks**. Shapefiles and geodatabases are both acceptable. Regardless of which you choose though, the submission must be zipped (.zip file) to upload. For this example, we submit a shapefile.
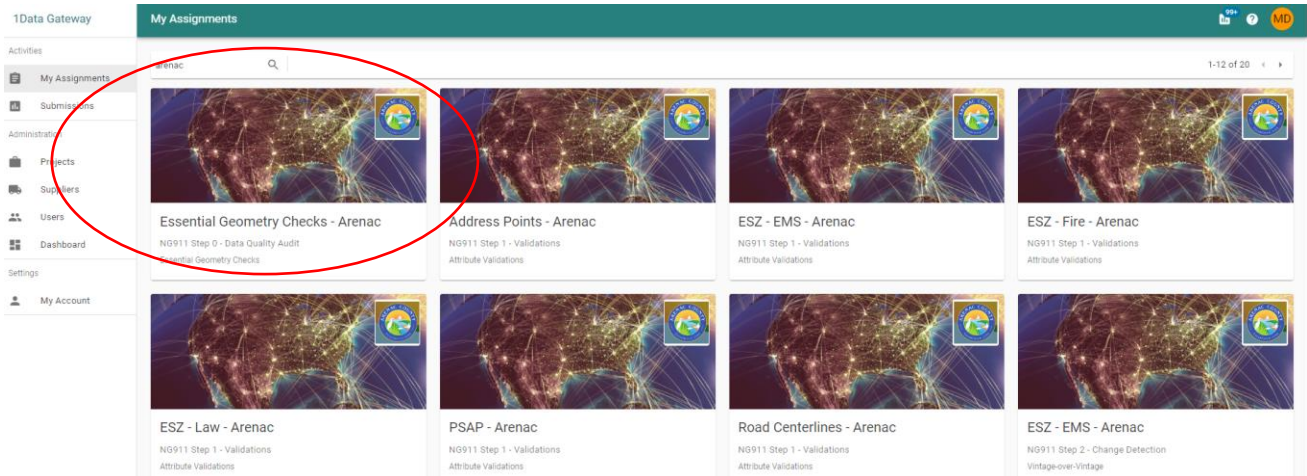

Figure 1 - Choosing Essential Geometry Checks

Once the submission type is selected, the **Submissions** page opens for that specific assignment (Figure 2). The start page may either be empty or populated, depending on whether you previously submitted data. If there were previous submissions, the table shows the creation date, the number of uploaded and output files, and the state of the submission (i.e. completed, paused, or stopped). The outcome of the submission is shown as either a green check denoting successful completion, a red exclamation point for completion with errors, or an orange X for a cancelled submission. You can also view and download the submission results.
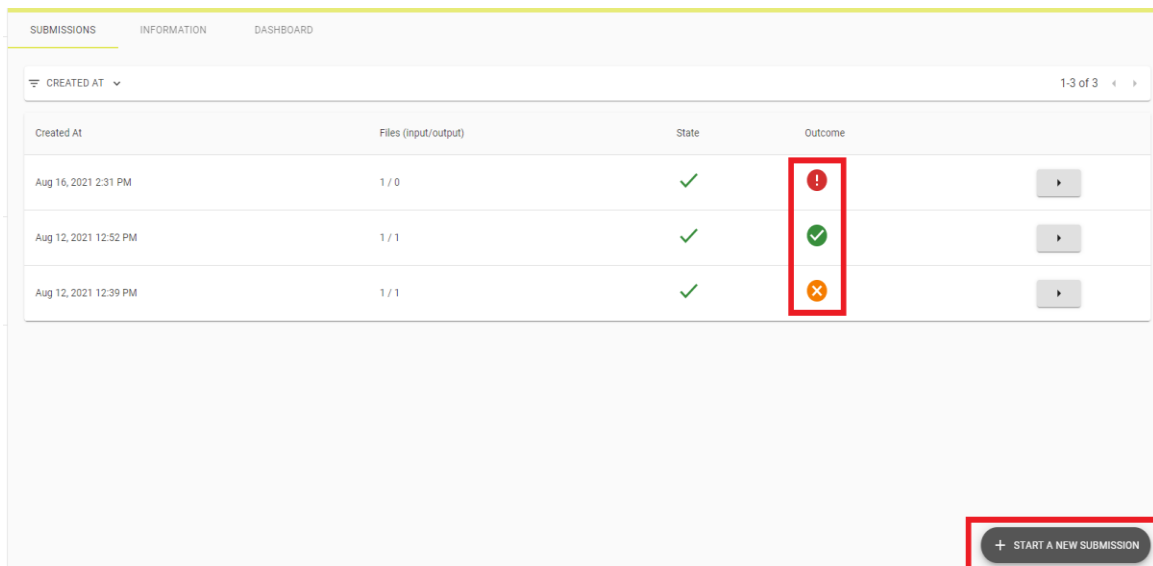

Figure 2 - Starting a new submission

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To start a new submission, select the *+ Start a New Submission* button in the bottom right-hand corner of the Submissions page as shown in Figure 2.

Starting a new submission will take you to the **My Assignments** screen (Figure 3), where you either drag and drop your file into the upload box or click the box to browse to your submission. This screen also allows you to see the steps involved in the geometry checks process:
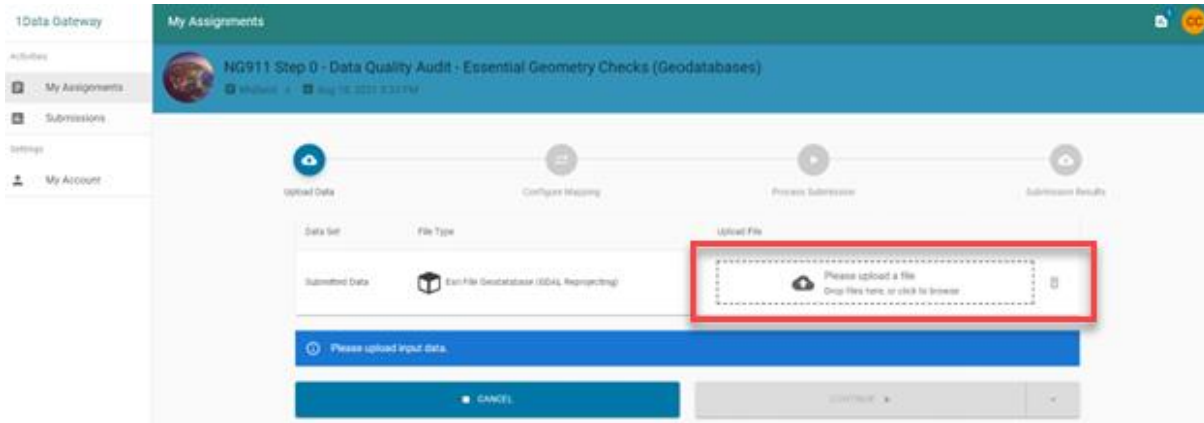

Figure 3 - Uploading data in My Assignments

After the upload completes, click *Continue* to move to **Schema Mapping** (Figure 4). The **Source Class** drop-down menu lists the dataset you submitted. The **Target Class** drop-down on the right allows you to select which class you will be mapping to. For this example, we will select **Feature**.
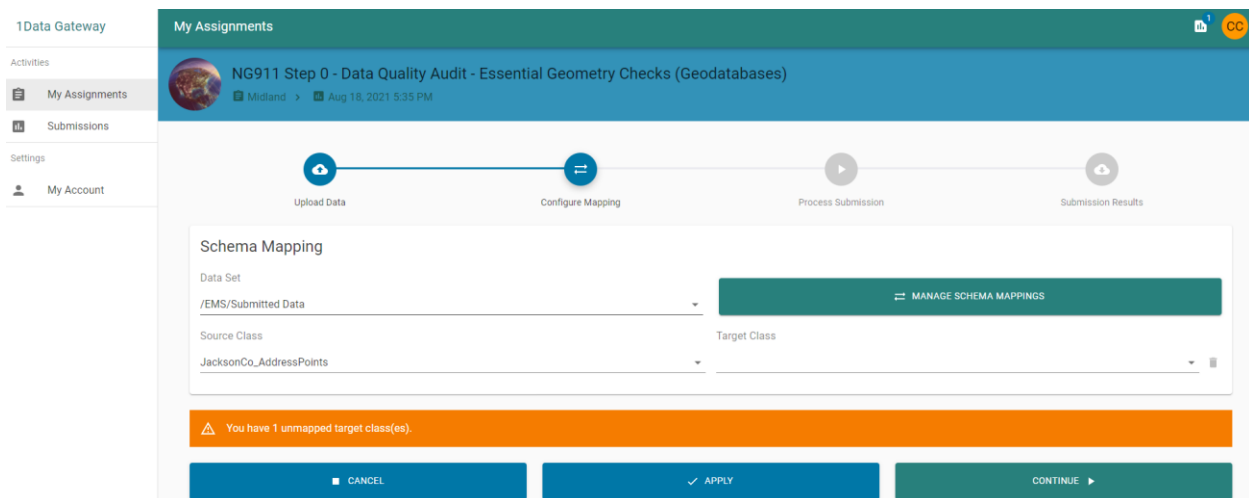

Figure 4 - Schema mapping stage

For the geometry checks, the only **Target Attributes** you must map are the **Unique ID** and the **geometry** (which is generally selected automatically since it is a one-to-one comparison). The Unique ID field can either be that field or any unique id field for a feature. In this case, the **Agency_ID** from the right-hand drop-down menu is matched to the **JOINID** attribute from the data submission (Figure 5). If you mismatch a feature in the drop down, just hit the trash can button on the right-hand of the target class attribute in question and make a different selection.

Figure 5 - Schema mapping

Once the Target Classes are set you can click the **Manage Schema Mappings** button at the top of the page. In the Manage Schema Mappings dialog, you can save the attribute mappings for the classes under any name (Figure 6). **Note: To use these mappings, you must select Apply next to the Saved Mapping options.**
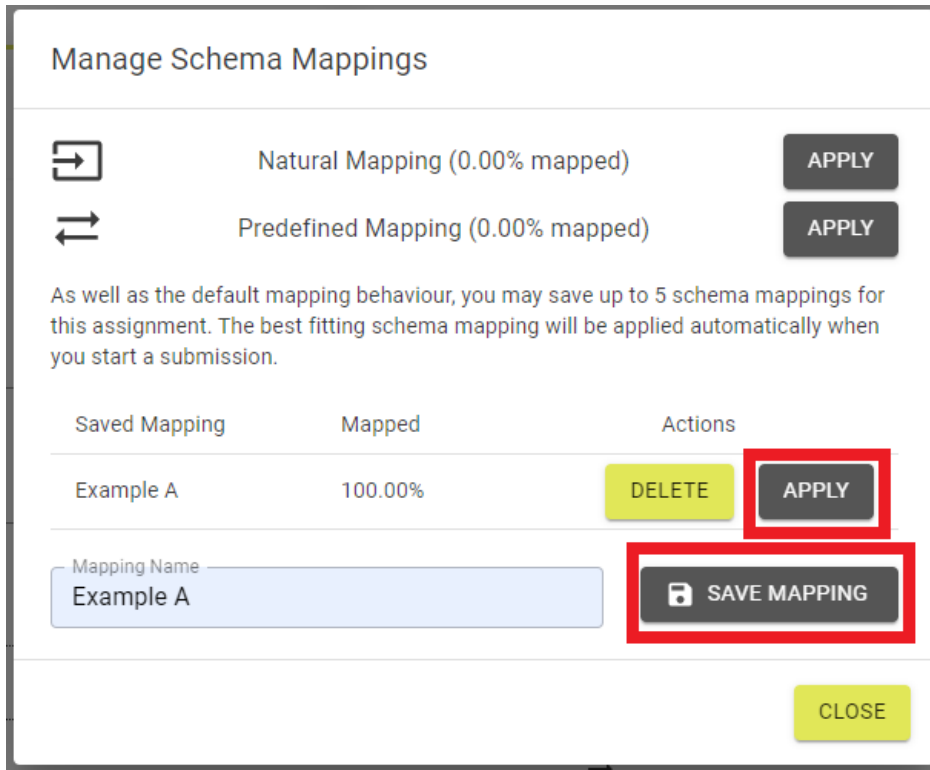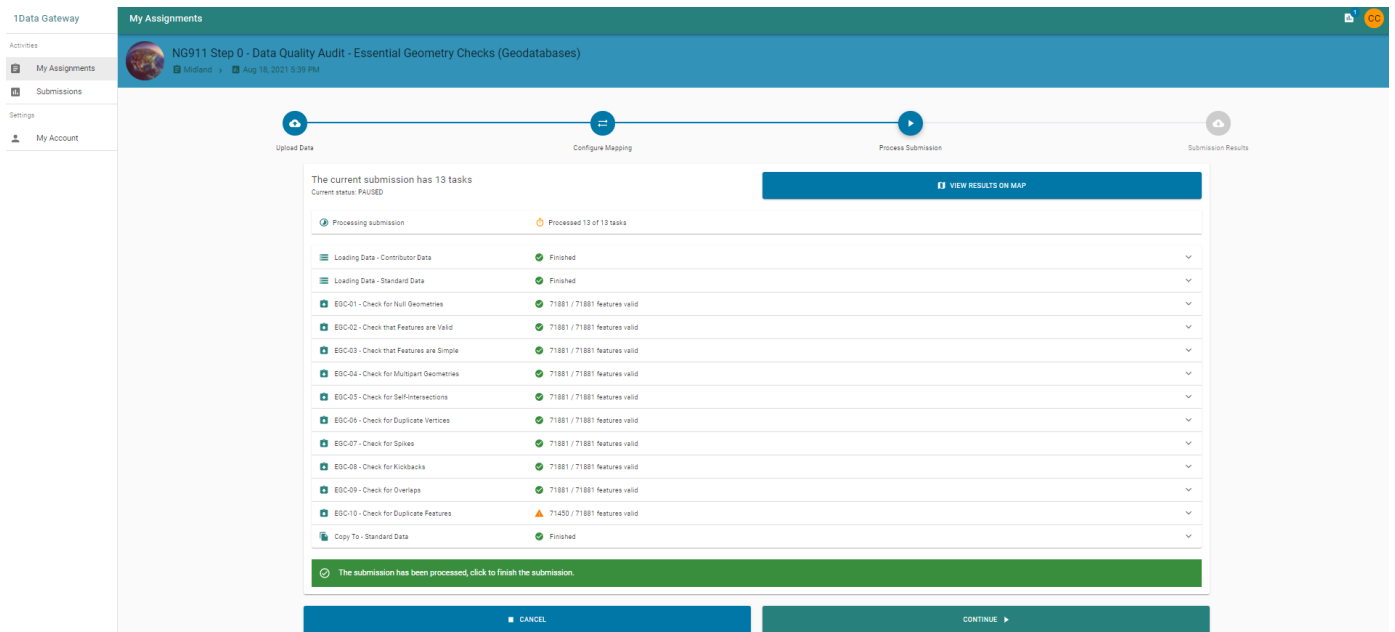
Figure 6 - Managing the schema mapping

Figure 7 - Data Quality Audit

Once you complete the Schema Mapping selections, click **Continue** to proceed to the next step, **Process Submission (**Figure 8). In this step, you can view any items that were flagged during the geometry check.

There is the option to View Results on Map. Select View Map to review the flagged items. Click on a point to see the pertinent details.

Note: If you want to look at the results on the map before downloading the output, then you must do it at this stage.

Navigate in the **Map Viewer** by using your mouse to drag across the map. Figure 8 highlights the Map Viewer tools. In selection A at the top of the viewer, there are buttons to **zoom in/out** and **view the recently selected item**. The bottom of that section provides an overview map of the features. In selection B, the user can either use the top drop down or the **Prev Task** and **Next Task** buttons to view map data at different points in the submission process logic. Selection C is an interactive viewer that allows you to select **Layers** by toggling them on and off. The **Feature** allows you to select features and display their details. In the figure below, a flagged item is selected and highlighted in yellow. The details and the attributes of that item are displayed in section D. The **Report** option in section C displays any errors present.
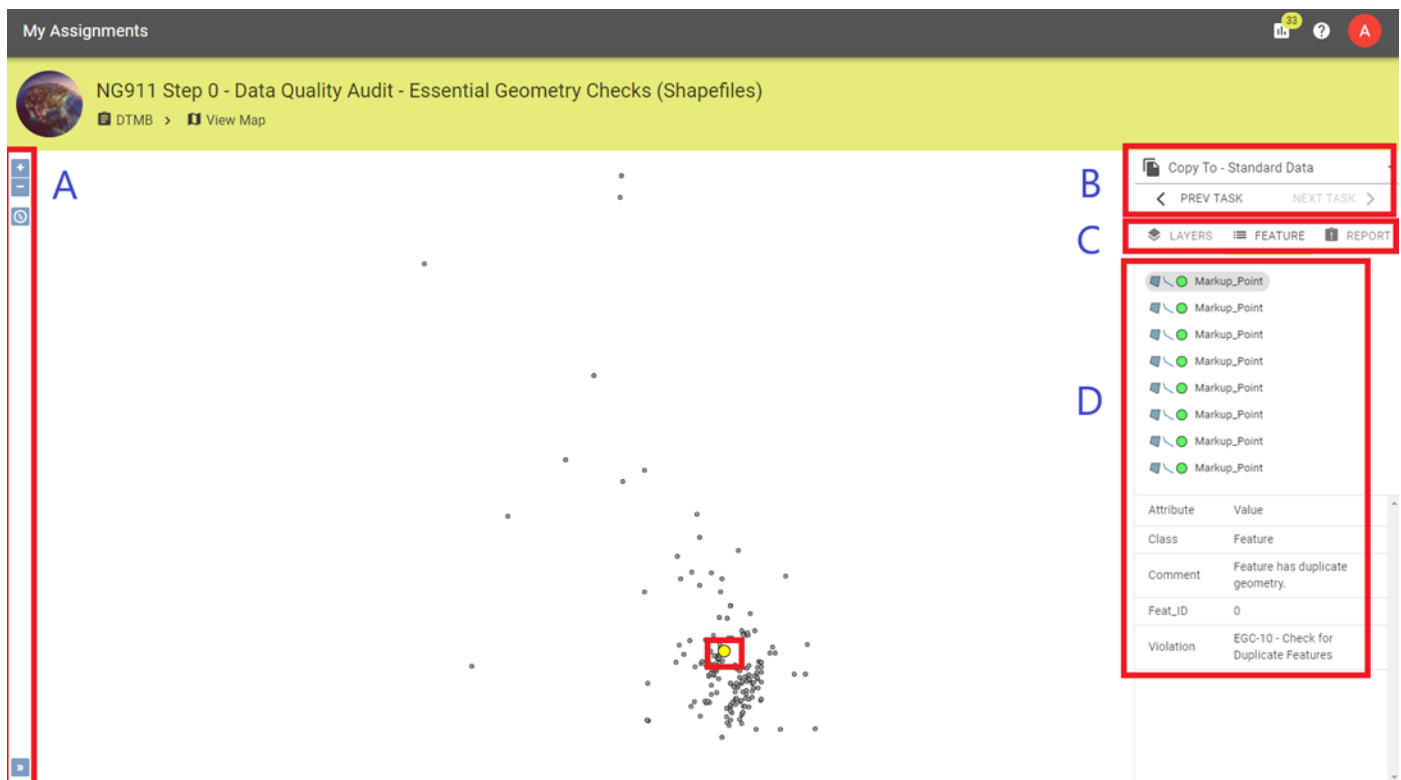

Figure 8 - Data Quality Audit report

The final stage of the submission process allows you to review the results from the previous stage and download the output markup file. Additionally, you can also download various reports and logs that give the details of the submission.
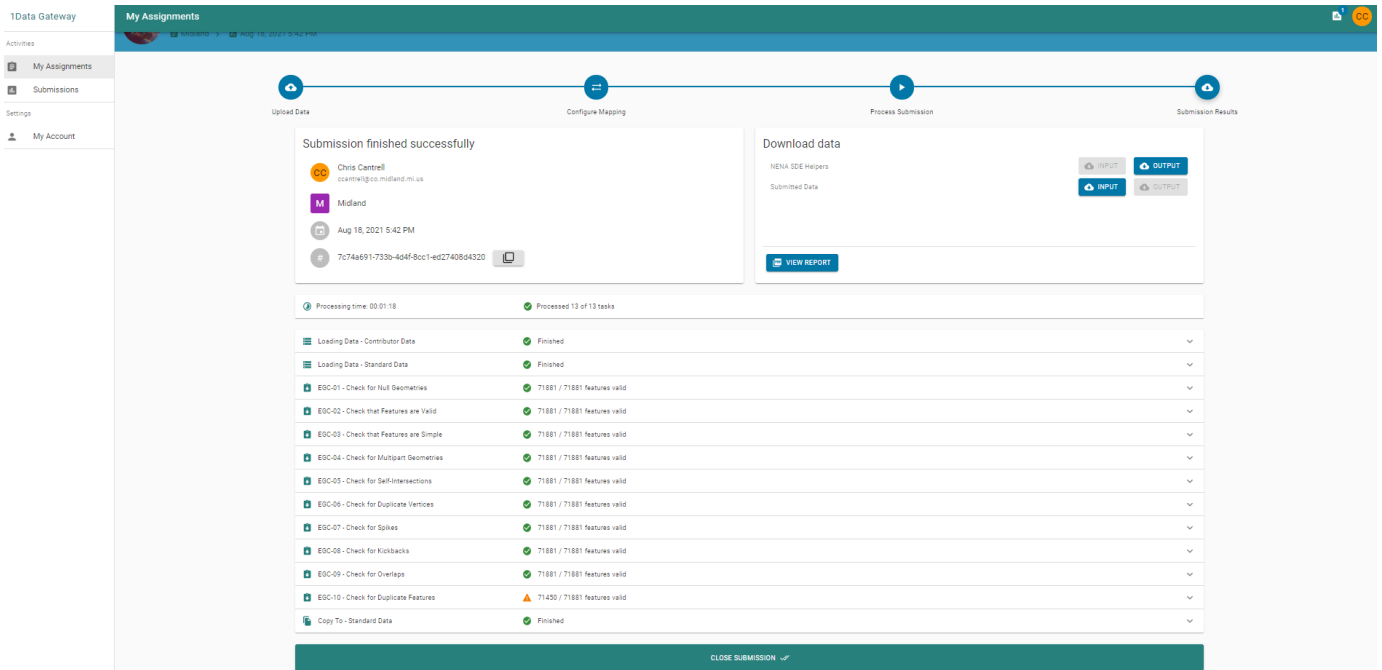
Figure 9 - Essential geometry checks reports

Markup data is populated with non-conformance information and available by selecting Output in the Download Data section. These outputted feature classes will show you what geometry checks were flagged, where they are, and provides you the opportunity to view the report or edit the changes before rerunning the data or moving forward. Markup types are dependent on the feature submitted and the geometry rule that they fail under. A markup will be an area, line, point, or table, generally. The Markup Summary provides a table summary of the number of markups by type and feature. So, if there is an address point that is invalid, a corresponding markup point will be created in that location with fields providing relevant information as to why it failed, which include class, comments, violations invoked, and geometry details. Markup classes are essential for determining the problem with the submitted data and either address it before continuing or note it for future updates.

Additionally, valid values are a series of class tables prepopulated to check that submitted attributes are valid. The tables contain lists of all valid US states, counties, and world countries so the NENA fields for State/County/Country can be check for validity. Any non-conformances will also be shown in the results, these are the result of submission features failing rules setup to test the data to required standards for NENA.

Any errors can be reviewed in the downloadable log files and can be reported back to DTMB personnel to review and address at DTMB-NG911GIS@michigan.gov. When providing error reports, questions, and/or concerns include all necessary submission logs and the session ID number for reference.

Attribute Validation

Meeting NENA Requirements

There is a NENA 911 Attribute Validations Project for each feature. These will help satisfy the NENA requirements by looking at the Conditional, Mandatory, and Optional attributes found in the available documentation. The standard submission will be reprojected into the proper format, so that the output coordinate system is standardized for comparison with each other post analysis. In the example below, we are running Attribute Validation on and address point dataset.

Therefore, you only must submit the feature analyzed for each submission and you will get a markup after the Submission that will report out all the attributes that violate the NENA standard attribute rules.
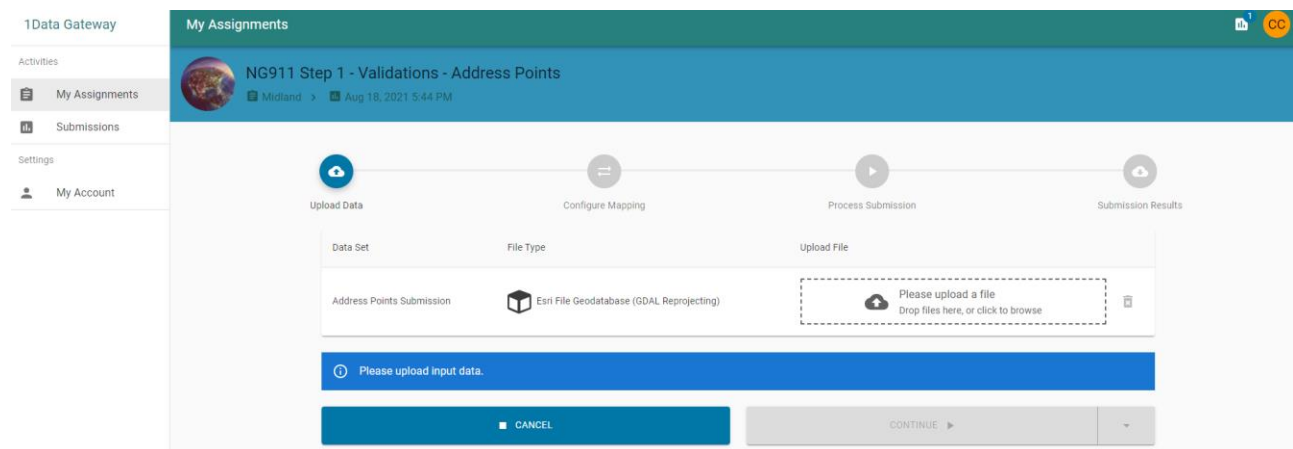

Figure 10 - Attribute Validation

After submitting the dataset, you move to **Schema Mapping**. To properly match the schema, you must equate the attributes in your data to the proper **Target Class** as shown in Figure 11.

The attribute mapping for each Assignment requires that users understand what attributes are present within their Submission and a basic understanding of what layers are conditional, optional, and most importantly, mandatory according to NENA. For example, the mandatory attributes for Address Points are:

- Country
- County
- Date Updated
- Discrepancy Agency ID
- Incorporated Municipality
- Site Structure Address Point Globally Unique ID
- State

Note: These attributes and fields can be reviewed in the data dictionary.
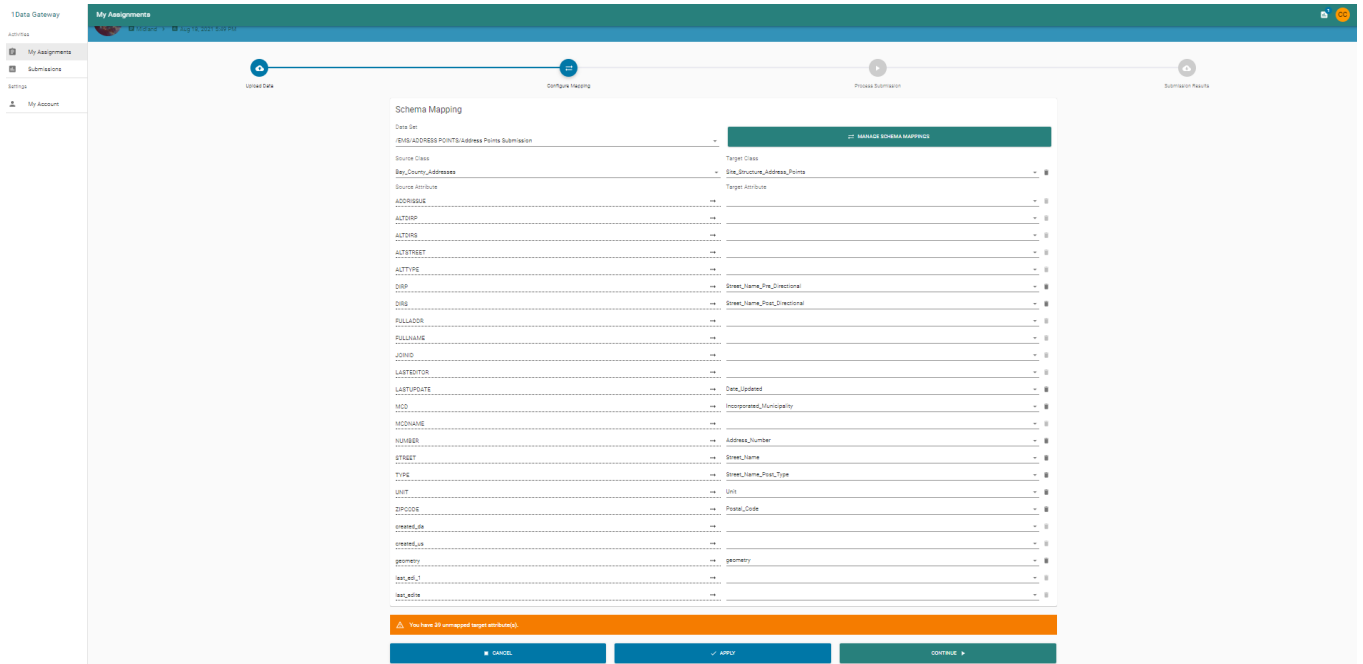
Figure 11 - Attribute matching

In 1DataGateway when a task falls below a desired threshold of conformance (default is 100% conformance), those results are highlighted as in Figure 12. You can expand the step with errors and begin an investigation of the flagged variables. Begin by looking at the Map Viewer to see what types of flagged attributes are being caught and noting problem features and determine if the flags are valid. Next, download the output markups and review the data.
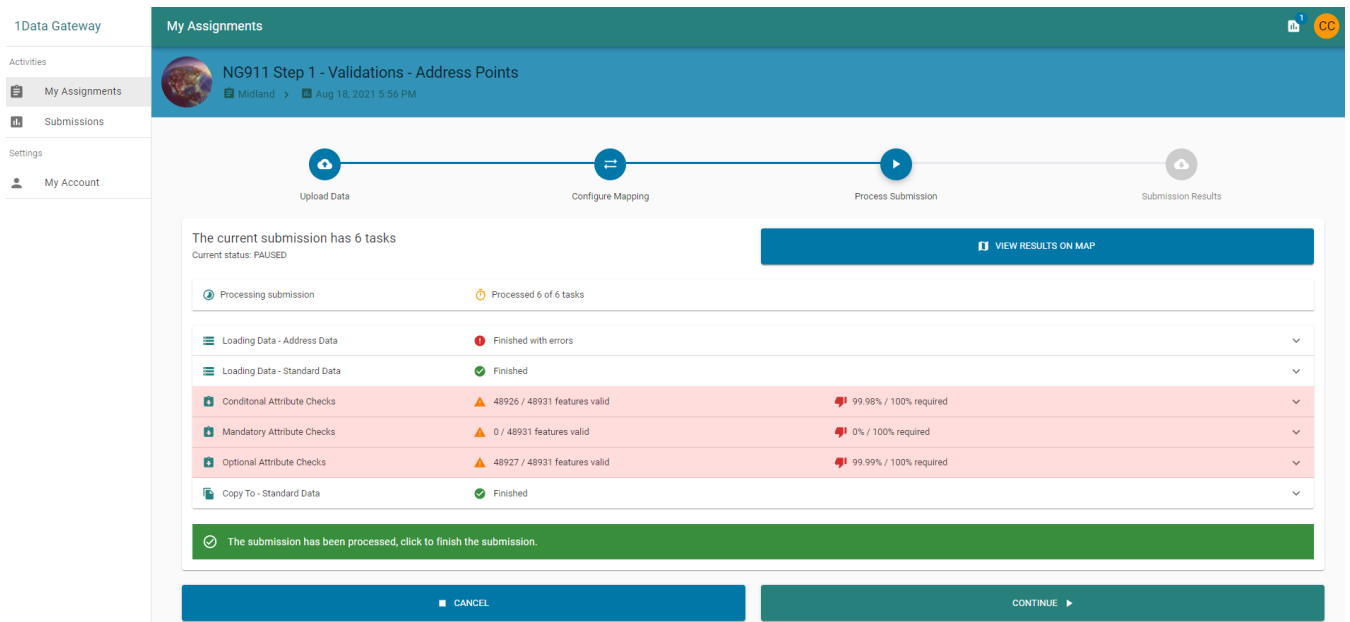
Figure 12 - Address Point Validation process

After the Attribute Validation completes, the **Download Data** section of the **Submission Results** allows you to download the **NENA SDE Helpers Output** (see Figure 13). The Helpers are the markups from the analysis and show which results are valid, and which need addressing.

Individual contributors are encouraged to submit standardized data that complies with NENA standards and this analysis will help with that process. In this example, the address data did not have a field for County, a NENA mandatory field, so the validation failed and flagged all features for review. Many such issues can potentially be handled by auto populating your data with County, Country, and State attribute fields prior to making a submission to 1DataGateway and running the Attribute Validation.

Figure 13 - Address Point Validation results

Change Detection

Determining Changes Since the Last Submission

The first time a specific feature dataset is submitted through 1DataGateway for a given area, it is referred to as an initial load. Subsequent submissions of that same dataset to that area are called. updates. Rather than replace the entire dataset with each upload, change detection is used to ensure only the data changes are applied.

Change Detection is the process by which data previously submitted is compared to the current submission to determine how features have changed. This process looks for changes ranging from attribute updates to new or edited geospatial features and classifies the new submission data as matches, adds, deletes, or scalar updates.

The process will determine which features submitted have an exact match in the base data as determined for spatial and scalar (attribute) comparisons. The submission first runs through preprocessing, which differentiates duplicate objects from the update and the base, and then identifies perfect spatial matches. During processing, adds and deletes are identified, and in post processing, scalar updates are flagged.

If there is spatial change detected in the submission, then the logic will apply it as an Add or Delete Proposal. Adds are new features and Deletes are features that existed in the base but have no current presence in the recent submission.
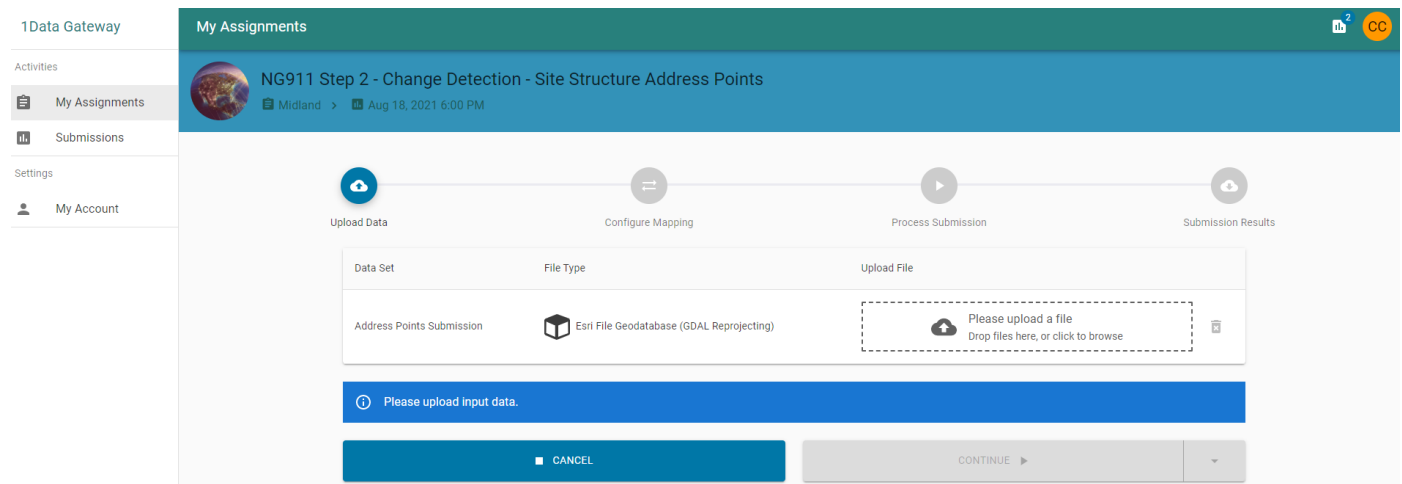

Figure 14 - Change detection
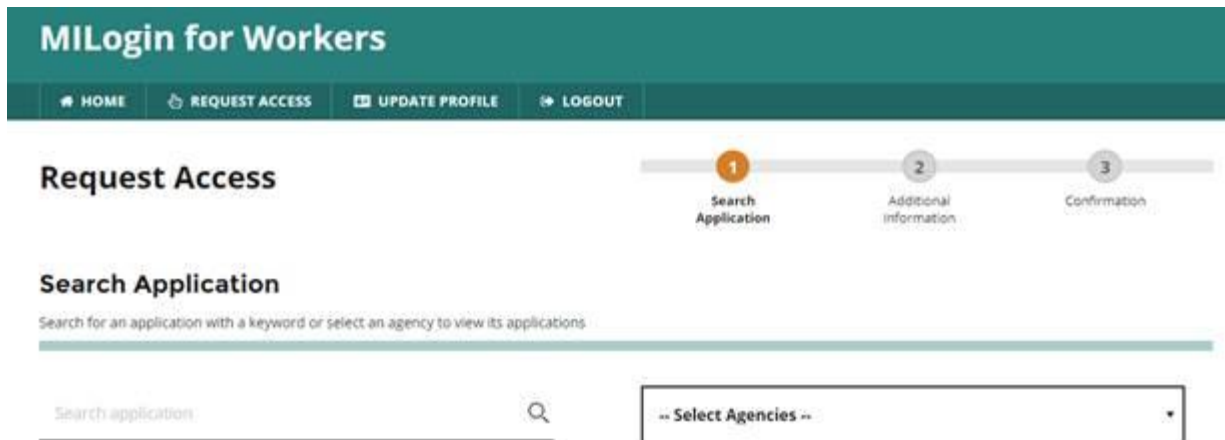
Appendix 1: MiLogin Process

Here is the initial login information to get you started with the Contribution testing on 1DataGateway:

Step 1: Go to https://milogintp.michigan.gov/

Step 2: At the top of the page hit 'Request Access'

Step 3: In the Search Application field, enter 1Data Gateway and select.

Step 4: Agree to the security questions and then enter you contact information. Then Submit the request by completing this request process.

The answer to the security question is always '**s3cret**' regardless of what the question is.

Request Access

Confirmation

✔ **Success**

The request for your access has been successfully submitted.

You will see the updated list of application(s) on your home page once it is processed.

HOME

Step 5: I will receive an email that you are seeking approval for access to 1DataGateway, once accepted you can continue onto the next step.

Step 6: Once you have approval. Go to https://1datagateway.state.mi.us/

Step 7: Select 'Sign in with MILogin Third Party – External User'

If you are having trouble with MILogin, feel free to reach out and contact me (JohnsonA85@michigan.gov) and we can set a meeting to troubleshoot the issue. We can also set a meeting to run through an initial test process if that helps get you started with 1DataGateway.

If you have any questions, problems, or suggestions, then feel free to reach out. If you need help setting up your submissions and assignments, we can set up another meeting to do so, just let us know.

Appendix 2: Frequently Asked Questions

Who do I contact with any questions about the NG911 GIS Repository or if I have technical issues with the application?

If you have any questions or technical issues, you can email DTMB-NG911GIS@michigan.gov

How will the data provided be used as part of the NG911 GIS Repository?

GIS data uploaded by data contributors through the NG911 GIS Repository import process will be used in multiple ways. First, it will be accessible to any approved NG911 Service Providers that require it for geo-routing of NG911 calls within Emergent Services IP Networks (ESInets) in Michigan. Secondly, PSAPs will be able to download data from the system to use within their 911 systems such as Computer Aided Dispatch (CAD) systems. PSAPs can only download those geographic areas that have been approved for download by the data-owning agency.

If I am participating in the NG911 GIS repository and the MiSAIL Imagery for GIS Exchange program can the data uploaded to the NG911 GIS Repository also be supplied by DTMB to the MiSAIL program?

Yes, if you participate in providing data for both programs, then data supplied to the NG911 GIS Repository will be also made available to the Imagery for GIS Data Exchange program via MiSAIL. This way an organization participating in both programs must only upload their data once when supplying data updates to DTMB. If you have any questions, you can email DTMB-NG911GIS@michigan.gov.

How do I connect to MiLogin?

Please reference the training materials to create an account, or if you have an existing Third-Party Worker account, the training materials will also describe how to request access to the Michigan Geographic Framework Data Gateway application for those with the role of Data Importer. If you have any questions, you can email DTMB-NG911GIS@michigan.gov.

If I have a MiLogin account, do I need to create another one?

The MiLogin account needs to be a Third-Party Worker account. The website is https://milogintp.michigan.gov/. If you have previously created an account as a Third-Party Worker, you should be able to login using your existing User ID and Password. Then you will request access to the Michigan Geographic Framework Data Gateway if you are going to be in the role of a Data Importer. Instructions to create an account and/or request access to an application are outlined in the training materials.

How do I know when I have full access to the system?

Once you request access to the Michigan Geographic Framework Data Gateway, DTMB reviews it to determine if you are an authorized Data Importer, and once approved you will receive a confirmation email. You will also receive another email shortly thereafter outlining next steps and onboarding for the application.

What data is uploaded to the repository?

The required data for the NG911 GIS Repository are the following:

- Site Structure Address Points
- Road Centerlines
- Fire Response Zones
- EMS Response Zones
- Police Response Zones

Currently the focus is getting site structure address points and road centerlines uploaded into the repository. There will be future training sessions on the response zone datasets.

How often should I upload my data?

We recommend an organization upload their data at least quarterly, for data layers that have been updated since the last upload.

What if my data does not have all the fields for the new schema?

We recommend data contributors importing data to the NG911 GIS Repository adopt the latest National Emergency Number Association (NENA) standards and schema. These have been outlined in the training materials and there is a template on the program web page, DTMB - Michigan Statewide NG911 GIS Repository. If a data contributor cannot adopt the new schema at this time, we recommend adopting minimum required fields (also outlined in the training materials). These would be, for site structure points: Discrepancy Agency ID, Unique ID, Address Number, Street Pre-Directional, Street Name, Street Type, Street Post Directional, Municipality, County, Country, State, Date Updated. For road centerlines: Discrepancy Agency ID, Unique ID, Street Pre-Directional, Street Name, Street Type, Street Post Directional, Municipality, County, Country, State, Date Updated, Left From and To Address Ranges and Right From and To Address Ranges. We recommend adding Civic Location Data Exchange Format Street Name fields to address points and road centerlines and populating these accordingly. This is outlined in the National Emergency Number Association NG911 GIS Data Model https://www.nena.org/page/NG911GISDataModel and the training materials.

Where do I find the latest NENA GIS data model standards?

You can find the National Emergency Number Association (NENA) NG911 GIS Data Model standards at NG911 GIS Data Model - National Emergency Number Association (nena.org) and the Civic Location Data Exchange Format standards at NG911 Civic Location Data Exchange Format - National Emergency Number Association (nena.org).

What is a Discrepancy Agency ID?

The Discrepancy Agency ID is the DNS domain of the organization maintaining the GIS data and importing the data into the NG911 GIS Repository. Typically, that would be the DNS domain associated with the email address of that organization. For example, contributor1@countyA.gov would have a Discrepancy Agency ID of countyA.gov. If a vendor has been contracted to perform data maintenance, the Discrepancy Agency ID should be the DNS domain of the organization contracting that vendor to perform the work. For example, if the county GIS department has contracted with the vendor, then the DNS domain of the GIS department would be used as the Discrepancy Agency ID.

Is there a format for the NENA Global Unique ID fields in the data sets?

The main rule of thumb for the NENA Global Unique IDs is to make sure the ID will be unique in a statewide data set. The NENA Global Unique IDs are 254-character fields, and the NENA Global Unique IDs can be a combination of characters and numbers. If you currently have a numeric unique ID, NENA has outlined a format of combining both the unique numeric ID with the Discrepancy Agency ID to create the NENA Global ID. An example of this would be with a numeric ID of 123456 and a Discrepancy Agency ID of countyA.gov, you can create the unique ID of 123456@countyA.gov. Another suggestion, if desired, is adding the feature type within that ID as well. For example, if this ID is for a road centerline you can format the ID as RCL123456@countyA.gov, or for site structure address points it could be SSAP123456@countyA.gov.