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| **Bureau** | **MTBE - Mature** |  |
| **Timestamp** | 5/25/2018 9:23:40 |  |
| **Email Address** | derek.bennett@des.nh.gov |  |
| **Dataset name (as known in the program/bureau)** | Drinking Water Quality Data |  |
| **Popular/common name (as known to others or the public, if different)** | Environmental Monitoring Database (EMD) |  |
| **Technical name (as known to developers/IT, if different)** |  |  |
| **Program** | MtBE Drinking Water Quality Program |  |
| **Is this dataset included in the DES System Inventory?** | Yes |  |
| **Please provide name(s) and email(s) for dataset steward(s) (who is responsible for the dataset)** | Derek Bennett - derek.bennett@des.nh.gov |  |
| **Please provide name(s) and email(s) for dataset maintainer(s) (who updates the dataset)** | Kala Day - Kala.Day@des.nh.gov, Carina Pearson - Carina.Pearson@des.nh.gov |  |
| **Please provide name(s) and email(s) for dataset developers(s) (who maintains the dataset)** | Derek Bennett - derek.bennett@des.nh.gov, Kala Day - Kala.Day@des.nh.gov, Carina Pearson - Carina.Pearson@des.nh.gov |  |
| **Please provide name(s) and email(s) for dataset business analyst(s) (who oversees the dataset)** | Melanie Cofrin - Melanie.Cofrin@des.nh.gov |  |
| **Describe the primary use of the dataset** | To track water quality information from samples collected and/or digitized by the MtBE Remediation Bureau |  |
| **Describe the content of the dataset** | Well locations, well constructions information, sample locations, analytical results from water quality samples |  |
| **Approximate number of records in dataset** | 10000 |  |
| **Approximate size of dataset (please indicate kb, mb, gb)** |  |  |
| **Where is the dataset stored? (Select all that apply)** | Server |  |
| **What NHDES program(s) does this dataset support?** | Multiple |  |
| **What business function(s) does the dataset support? (Select all that apply)** | Enforcement, Activity Location, General research into NH drinking water quality |  |
| **Is this a geospatial data set?** | Yes |  |
| **Dataset format** | Shapefile |  |
| **Feature name (if in geodatabase)** | Environmental\_Monitoring\_Database\_Stations.shp |  |
| **Types of feature(s) (Select all that apply)** | Point |  |
| **Positional accuracy** | Varies |  |
| **What location attributes (or data fields) does the dataset contain? (Select all that apply)** | Address, Lat/Long, Parcel Number, Other location information stored in other datasets that may be derived through spatial and non spatial joins |  |
| **What metadata, or data documentation, is associated with the dataset?** | Metadata exists that is maintained by others. I do not knw if it is FGDC Compliant. EMD data is a repository for many different programs inside and outside of NHDES. |  |
| **Format** |  |  |
| **Table/Spreadsheet/Document/View name** |  |  |
| **What location attributes (or data fields) does the dataset contain? (Select all that apply)** |  |  |
| **What metadata, or data documentation, is associated with the dataset?** |  |  |
| **How are data collected? (Select all that apply)** | GIS or other geospatial software, Google Earth/ Bing Maps, GPS, Phone or Tablet, Outside groups or people submit data (on a permit application or other) |  |
| **If you use a GPS to collect the data, what is its accuracy? (Select all that apply)** | Recreational Grade (+- 15 to 50 feet) |  |
| **How are data validated or Quality Assured/Quality Controlled? (Select all that apply)** | Reviewed by data collector, Reviewed by data manager |  |
| **What tools and/or automated processes do you use to validate the dataset?** | Spatial joins with town boundaries to esnure points are within the correct town (frequent), spatial joins to ensure point is plotting on the correct lot (less frequent). |  |
| **Do you rely on any documented quality assurance practices to validate the dataset?** | Yes |  |
| **Once the data is collected, is analysis done on the data to meet business needs?**  | Yes |  |
| **Is data transferred to a database or another format for program use?**  | Yes |  |
| **Are analysis procedures documented?** | No |  |
| **Date of last dataset update** | Dataset is created and updated daily |  |
| **What triggers an update? (Select all that apply)** | Regular Interval |  |
| **How is data updated? (Records submitted via webform, field data collection, automated script processing, etc.)** | Submitted via webform through a .xlsx template |  |
| **Are there any documented update protocols?** | Yes |  |
| **How many records are edited/updated/removed per month?** | Depends on definition of record. Anwhere between 50 and 400 wells are sampled each month. Each well will be analyzed for 70 - 200 analytes. |  |
| **Software used to collect/manage dataset? (Select all that apply)** | ArcGIS, ArcGIS Online, Google Earth |  |
| **Hardware used to collect/manage dataset? (Select all that apply)** | Desktop, Phone, Recreational Grade GPS |  |
| **Who is this dataset shared with? (Select all that apply)** | NHDES Only, Public, State Agencies, Federal Agencies |  |
| **How is the dataset shared? (Select all that apply)** | Published Service, One-Stop, GRANIT, Shared Network Drive |  |
| **How often is the dataset published for shared access?** | Daily |  |
| **Is there a documented data sharing policy** | Yes |  |
| **Does the dataset contain any of the following? (Select all that apply)** | NHDES Sensitive Data |  |

A lot of different program contributing data to EMD.

MTBE program is 3 years old. Database is statewide. Sample private water wells that may have been impacted, and provide them with safe drinking water if they have been impacted. Non regulatory. But could lead to regulatory oversight if wells have been impacted.

Issue is groundwater related.

250,000 private wells in the state. So focus on areas where there have been known released of gas in the past – leaking UST, auto salvage yards, etc. – places with documented releases. Often, these areas have been tested to some extent.

Funded by dedicated fund ($86M to NH only from most gasoline companies) – in a trust that can only be used for MTBE cleanup purposes.. Exxon Mobile chose not to settle, fought it to Supreme Court, and ended up having to pay $236m to the state. That money is set aside into a trust fund used for safe drinking water only.

Focus on an area they want to target, look at parcels, intersect that with community water system layer, then identify people who are on a private well. They contact those private well landowners, offer to test the well. Attempt to tie back to well inventory, but many wells (including those prior to 1994) are not in the well inventory.

Find MTBE in 15% of wells – at low concentrations. If find it in elevated concentrations, then will resample and work to install a point of entry system to remove the MTBE. If heavily impacted area and lots of residents and a community water system, will extend the public water to those homes.

Information is not provided back to well inventory because the homeowners don’t know enough information about the well, e.g. depth, etc.

Will be more important over time to connect back to water/sewer line layer. And additionally, important to know who is actually connected and who is not.

Parcel mosaic is sucked into access database (including all attributes). That’s where Derek maintains his homeowner contact info. Also maintains an identifier that gets tied back to EMD for testing information. But Derek’s link is based on the object ID in the parcel mosaic (because the GIS ID doesn’t always link successfully), which means he has to maintain all versions of the parcel mosaic he has used. Currently about 6-7.

Two EMD id’s – StaNo (station number, related to well location) – unique to the sample location. Then for each sample location, have multiple activity results (with an Activity Number) for different sample locations. Could have multiple stations for each property, e.g. one for each faucet. Derek can tie these back to one property through his Access database (e.g. through the parcel id).

A lot of DES programs don’t require data to be submitted in a manner that can be submitted to EMD. E.g. some programs require just pdf reports.

What would be most useful – how he uses parcel mosaic and water/sewer lines to identify properties.

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Would E911 data with front door of building be helpful?

Compare address of parcel with address reported by E911. Do you ever mail things to the wrong place and have mail returned?

Do you ever navigate to the wrong parcel?

What are the standards and how are they comparing the results to those standards?

### MTBE

#### Environmental Monitoring Database (EMD)

* Actions related to testing and remediation of MTBE contaminated wells.
* Statewide database; ~3 years old.
* Non-regulatory, but could lead to regulatory oversight if wells have been impacted.
* Initial action based on known releases or candidates
	+ Salvage yards, leaking tanks, or hot spots.
* Parcels are intersected with community water distribution areas to identify residents on private wells, and then to generate a mailing list notifying residents that NHDES will be taking water quality samples. Distribution areas data is not well maintained, and is particularly spotty for village water districts. Will become more important over time to connect back to water/sewer data layer.
* There are multiple ID’s in the database
	+ Station ID: Unique for the station location e.g. Pat’s house
	+ Station Number: Sample location, well, pre-treatment, storage tank etc.
	+ Activity Number: Used for the results of testing
* If test results warrant, NHDES will procure and install a point of entry treatment system and continue to monitor water quality.

MTBE Remediation Bureau – began in 2014. Multiple groups. Derek’s grtreoup samples water wells that may be at risk of exposure to gases/MTBE. Use parcel mosaic, community water lines – intersect the 2 – and identify areas with high %’s of private wells where there are known releases of gases in the past. Then send letters to homeowners offering to sample the wells free of charge.

Not just doing VOC’s now, but also doing PFOs, etc. – program has grown. Beyond parcel mosaic and community water lines, also communicate with water supplies.

Use parcel mosaic and phones with Google earth to obtain lat/long. Try to put the point on the wellhead. If can’t – use aerial photography and put point on the rooftop and perhaps offset the point to the side of the house where they know the well is located. They collect from the storage tank itself and try toi plot it on the wellhead. If they collect a sample of treated water from a faucet, then plot the point on the home.

When Derek was with well data years ago, they used parcel centroids …

These are then their stations. One of their first steps – go into EMD and determine if there are stations already recorded. If so, will try to verify their location basead on parcel data. (If needs to be moved, they go ahead and do it so it overwrites the location.) Per Derek – should be a formal process to check with the Program Manager/Data Owner to confirm that there’s not some other factor that means the point shouldn’t be moved. When they perform this update, they actually overwrite the lat/long in the database. There’s only one field that tracks who and when the table was modified, so doesn’t capture all changes and doesn’t indicate the nature of the change.

Why would point already be in EMD? Because DES collects 100’s or 1000’s of sample results from consultants, who are required to submit pdf reports. Sometimes it comes in digitally. If so, it is usually geocoded but not verified. So Derek’s group verifies it. If multiple stations for the same well – may/may not combine them into a single station – depends on the priority of the station. But Derek’s concerned – there could legitimately be multiple wells/stations on a property (e.g. due to drought, etc.).

Geocoding – using Parcel Mosaic geocoder, and then ESRI geocoder as backup. But that applies to Kristen. Others, e.g. Melanie, probably only use ESRI.

What is the biggest QA/QC issues? Are they actually putting it on the corrects parcel, particularly if only address was pre-911? And 2) are there correctly tying the data to the well when there could be multiple wells on a property. And sometimes people get water from wells on another propert, e.g. per their property deed, and/or there are frequently shared wells. So feels like data should be tied to actual physical location, e.g. lat/long, rather than parcel data. Also issue of staff turnover despite they have SOPs. Not a question of limited staff, but more of staff turnover. Derek fells like they spend a lot of time collecting data but not enough effort/time/processes to confirm what they collect. Data is there to support QA/QC, but they don’t have the processes. Occasionally he’ll run a report that says show me all the wells that don’t plot in the correct town, or all the wells that don’t plot in the recorded parcel.

They sample 100-200 wells/month, so have 8,000 of their own stations (with 20,000 samples tied to these stations) as distinct from records submitted by consultants.

IN the case of a shared well, the address entered is the location of the well. That may/may not be where they actually sample.

When they’re physically on the property, they put the point on the wellhead for untreated systems, and on the house if sampling out of the faucet for a treated system.

They also maintain an Access database that tracks who was contacted and requested the sample, etc. So this is where they extract metrics to report how many were notified, etc. The two are linked via Station ID that ties back to EMD. At present, it’s a single Access table – so if a property has 3 wells there are 3 records in the table for it.

Derek – knows there are better ways to organize the data but doesn’t know “how to get there”.

They haven’t had strategic discussions about how to better design the database, how to better manage data, etc. Has asked for assistance from OIT, but nothing has materialized. Every program within DES pays OIT for technical support and has a person assigned. Issue with OIT isn’t lack of competency, but they have too much on their plates.

EMD – all point data, sampling data from DES programs. Started out with surface water quality grab samples, but then other programs started to participate. Over time, have modified the database to accommodate these programs so now it’s somewhat messy and may not meet the needs of the various programs. While it was just “redone”, it was likely just migrated to a supported platform and not really modified. One issue – lots of online tools that submit directly to EMD, so changes to the database would impact these programs.

Ever send letters out that are returned due to poor addressing? Occasionally. If so, they have a code that they use to flag it.

So they have 2 databases (participation database and EMD). Also have paper records that record treatment information. These are all scanned and tied to the address and stored in folders following a naming convention they have developed. (Should they be tied to the station ID? Probably not necessary, since most inquiries are based on the address. And they can look up the station ID in EMD if necessary.)

To draw the polygon – locations of known releases, of hazardous waste generators, based on topography – “best available data”. (This is the polygon used to intersect the parcel mosaic so they get their initial notification list.) They have financial resources, so can be fairly liberal with their approach. (If they had to be more conservative, Derek might be more interested in automated tools to draw that polygon.)

Derek – has to maintain prior version parcel mosaic since they use that address information.

Samples get shipped off to labs. Results are returned electronically and uploaded to EMD, with reports sent off to homeowners.

Derek has staff responsible for checking the returned reports. Values above a threshold are flagged by the consultant. EMD also has tables that shows limits (MCL – Maximum Contaminant Level) for each, so they can run a query and show all records that exceed those MCLs.

Derek’s notification database – keep track of when letters are sent out. But no way to issue a query to see if everyone got the correct report. What happens frequently – homeowner claims they didn’t receive results. But Derek can go back and find the correspondence that was sent. Usually it’s an email issue, as homeowner can indicate whether they prefer email or hard copy and most opt for email. So Derek tells them to check their SPAM.

If they can tie the EMD record to the well inventory, they bring in the Well ID (but into a field that it wasn’t in tended to be used for).

Overall, feels process works well. The part that may be problematic – the “bean counting”, e.g. how many wells they’ve sample for various programs. This info is derived from the Access data base that Derek built and was initially intended for just one program and is now being used for multiple purposes.. The EMD database and locations, though, he is reasonably confident in.

Do you ever start with the Water Well Inventory? Only in areas where it appears there are public water distribution lines but they believe there may be private wells that they would otherwise miss.

Water/Sewer layer – very important starting point. They probably could use program resources to build out this layer. Per Kristen, they have had periodic discussions about it, but haven’t nailed down what exactly they need (since different programs have different requirements) and how they will maintain it over time, etc. In the past, DES hasn’t met much resistance from municipal water suppliers, but often times have encountered resistance from private supplies (Pennichuck, Aquarion, etc.) Derek – typically will not request the actual data but will send ults list of addresses and ask them to check against their billing record

Pat – recommended using ESRI Dashboard for the accounting tasks.

Derek – also looking at Survey123. Currently writing down lat/long values in the field and then keying the data in.

Derek’s staff – 9 or 10. His activities are guided by the Settlement Agreement with Exxon/Mobil, which describes what they can do. Also have funds from Trust Agreement. Also will collect data on behalf of other programs as well as the programs pay for the data analysis. Those other programs may have very specific rules governing what they can/cannot do.