

Levy Analysis for the Vaughn Fire Service Area (VFSA)

062815 Report

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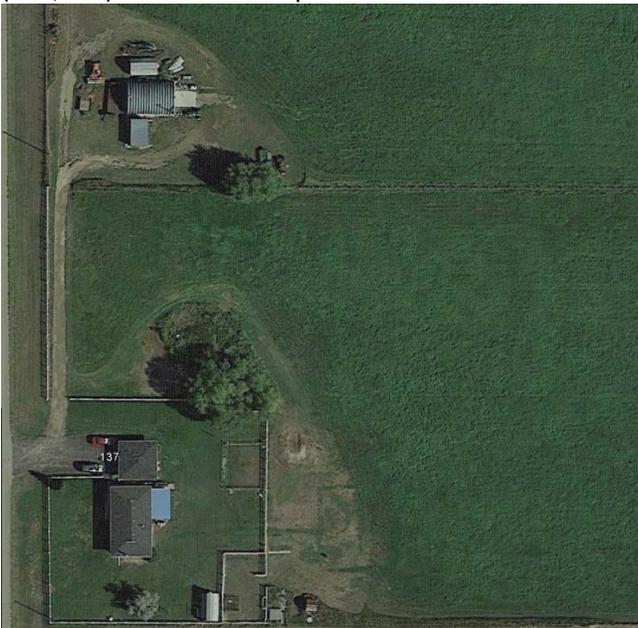
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Objectives:

This analysis was requested by the Vaughn Fire Service Area, Manchester, Cascade County, Montana. The goal of the project is to complete an updated inventory for Levy purposes. It consists of a detailed inventory of all significant structures in the FSA, based on defensible data, gathered in a systematic, reproducible way. Each structure is linked to either a parcel or to an individual assessment. Un-linked or unknown parcels are flagged for further analysis. Methods include a detailed, aerial and ground-based data survey at a detailed scale (1:1,000), canvassing the entire 178 sq. mi. (114,000 acre) district.

Methods:

I imported RE and MH Levy pdf's (from the County) to EXCEL, cleaned them up, got updated structure data (from the County), clipped parcels from updated County data, developed and reviewed links from the levies to structures for trailers, and levies to parcels for other data. I cleaned up the data (there are differences in SITUS address formats, a few errors, and some wrong addressing). I have integrated 2014 and 2015 imagery, so I see most new construction. I got new addresses from the County. They are almost all just open lots, but I checked them spatially. Each structure was evaluated at a detailed scale (1: 1,000). See the example below.



I used an ACCESS database and ARCGIS to join and review data to get the results below. I used structured queries to review non-spatial data and remote-sensing to review structures and parcels

linked to that non-spatial data. Because of the large number of records, I used queries to systematically evaluate data, checking for duplicate and erroneous values.

Data and Materials:

Imagery: 2014 and 2015 sub-meter color satellite and fixed wing obtained from GOOGLE. This image was used as a base for mapping and projection. GOOGLE imagery and address searching was integrated with ARCMAP using ARC2EARTH software. It is recent and detailed enough to reliably interpret habitability in almost all cases. Land Ownership was variable in quality and geo-registration. It was warped to the image via a translation algorithm to fit the ownership pattern on the landscape.

- Analysis Boundary: The VFSA boundary is taken from a State layer on Fire Districts and Service Areas in Montana from the Montana State Library.
- Land Ownership: Land Parcel boundaries are from the Montana State Cadastral website. These were spatially adjusted to the image as needed.
- Structures: Structures are from the Montana State Library, modified by updates from Cascade County GIS and City of Great Falls GIS.
- Roads: Roads are from the Montana State Library, modified by updates from Cascade County GIS and City of Great Falls GIS.
- Existing MH Assessments: These were obtained from the Cascade County Treasurer's Office, as well as a listing of RE (land) parcels in the VFSA.
- Current owner levies/taxes: Where needed for ground truth, the Cascade County Treasurer's web-based Itax site was used.
- Structure Data: Montana State ORION database for structure tax assessment. About ½ of the ORION-based addresses joined with Parcel data.

Levy Process Review Criteria.

Land parcels with residences are levied by structure (1 unit per habitable structure). Businesses, garages and outbuildings are not levied unless they have utilities (water, sewer, and electricity). Quoting the criteria, from Leonard Lundby, Chief as of May 28, 2015:

"Here is the criteria that the Board has agreed to (along with the county attorney):

- 1) A habitable structure can only be assessed once; however there may be more than one habitable structure on a parcel.
- 2) In order to be considered habitable, a structure must have water, sewer and electrical service.
- 3) A habitable structure can be assessed whether occupied or not.
- 4) A structure used in a business can only be assessed if it meets the criteria for a habitable structure (see #2 above)
- 5) A home with a business within, or attached, can only be assessed once.
- 6) Only the structure is assessed, not multiple living units within a structure."

Therefore, in my analysis a shop without a sewer hookup and/or water will be assessed a zero levy. An active business (such as an auto repair shop) will be assessed a zero levy, unless it has sewer and water. Barns, machine sheds, horse arenas, body shops, milking sheds, or dorms etc. without sewer hookups will be assessed a zero levy. However, restaurants and most retail businesses will be assessed a positive levy, because they normally have sewer and water. All residences and mobile homes on foundations will be assessed a positive levy. All multiple-family structures will be assessed a positive levy, but only on the structure, not on family units. An apparently-inhabited structure not having electricity (only gas)

will be assessed a zero levy.

Interpretation

Existence of sewer, water, and electricity was inferred from the image signature, context and structure data. Habitation was inferred from apparent present use, as viewed vertically from the air, by oblique view, or by “street” views supplied by GOOGLE. At least three lines of evidence were required for a non-zero levy designation. These could include image signature, image context, ORION data, review with local fire personnel, ownership records, structure type, or ITAX input. Furthermore, the ORION database where applicable was used to enhance descriptions of each structure (heating types, construction, finishes, etc.). See below for examples.



MH or Mobile Home Levies

Mobile home (MH) levies are applied to individual mobile homes, not to the property on which they are located. A spreadsheet provided by the County showed 440 Assessments with this MH designation in the VFSA. All visible mobile homes were assigned a levy, either to the MH Assessment or, where no MH Assessment could be found, to a land parcel. See example below for a mobile home park in Vaughn. In this case, all mobile homes were joined with an MH Assessment by address. One residence and the RV park were also assessed, both on the land parcel.



Results:

- 2,652 individual Parcel polygons were reviewed, underlain with imagery and overlain with 1,746 structure locations. Thirty additional mobile home structures were located and digitized to account for MH levies with no corresponding structure point.
- Parcel (Assessment) number was not unique in many cases. Multiple adjacent or non-contiguous polygons may have the same identifier. Therefore, the polygon levy results were “dissolved” by this identifier to 2,470 individual land parcel Assessments, adding together all levies for each Assessment. Final land parcel levy total is 1,254, from 1,305 non-zero Assessments. Parcel levies vary from 0 to 8.
- Not all parcels with existing habitable structures were levied. Fire stations, government facilities, the American Legion building, and cemeteries were not levied. These, plus numerous road right of ways made up 1,160 polygons on the land parcel layer. These are generally marked “Exempt from VFSA levy” on the Comments section of the polygon layer.
- For MH Assessments, initially only 388 matched structure address data. After manual adjustment of addressing formats and correcting spellings, 423 were finally joined by address to structure data, and each was given a “1” levy. The remaining 27 were identified as either located out of the VFSA, addresses not existing in the County system, or duplicates of existing locations, so could not be reviewed.
- There are a few parcels that do not have structures at the present, due to removal. The levy for these is reduced. Recently-burned structures are not reduced. Though present use is not considered in the levy process, obviously-abandoned and decrepit structures are levied a zero, in particular, junked mobile homes. See example below for junked mobile homes.



- TOTAL: There are a total of 1,677 levies (1,254 by land parcel and 423 by mobile home (MH) assessment). At \$75 / structure, this represents a total of \$125,775 for the VFSA. Though increase in funding was not an objective of this project, this represents about a 9 percent increase over the “old” levy of \$115,000. Most of this change is due to newer residences and discovery of multiple residences on parcels.

Results are in spreadsheet format. “VaughnFireServiceArea2014Levy_LandParcels062715.xlsx” contains all 2,470 Assessments in the VFSA. Each has an “Assessment” or parcel identifier, a “Total_Levy” (a count), a “Total_Polygons” which refers to the number of polygons having the same “Assessment”, and “Owner_Name” from the ownership layer, “Owner_Addr”, and a “Legal” or legal description of location.

All 423 MH Assessments are in “VaughnFireServiceArea2014Levy_MHParcels062715.xlsx”. Each has a “Parcel” or parcel identifier, a “Total_Levy” field, an “Address” field containing the best estimate of current addressing, and a “Legal” field.

Both of these spreadsheets should be given to the County Treasurer. Instructions to the County should include “Replace all Assessments with these”, so Assessments can reflect an un-biased application to all parcels in the VFSA.

Accuracy and Quality Control

This is a remote-sensing based study, using supplementary County ground truth information. Almost all parcels were reliably interpreted. Most were interpreted using both 2013 and 2015 imagery, 3D oblique imagery, and street views to help identify newer construction and establish use. However, 80 of the 1,254 levied parcels had enough ambiguity that they were flagged, though the levy was counted for each. “Probable” was flagged in the Comments field on the polygon layer. The most common factor was tree cover. Assessments, addresses, and owners of these “Probable” parcels are in spreadsheet “OwnerParcel2015ProbableComments062815.xlsx”. These can be checked using local knowledge if needed.

An additional 51 parcels are flagged “Possible” in the Comments field on the polygon layer. These were not levied, but have a potential for habitable structures based on imagery review. They should be reviewed on the ground if a better estimate is needed. They are in the spreadsheet “OwnerParcel2015PossibleComments062815.xlsx”.

The new levy was not directly compared to the previous County-provided levy. This was to preserve independence in the study. However, the 440 County-provided MH parcels were used as base data to start the review. It appears that about 10% of these were inaccurate or unknown when reviewed in this process, giving a basis for an accuracy estimate.

There are up to 15 mobile homes that would not join to an MH assessment by address or owner of the parcel. These are primarily in the Sun Prairie and Windsor LN areas. In the absence of any other data, they are levied to the enclosing land parcel. Since there was no way to check this with existing data, these may represent some double charges.

Six addresses with MH levies were discovered in the County list that lay outside the VFSA spatial boundary. These were not reviewed in this study.