

5/19/22

Groundwater Coordinating Committee Minutes

Attendees (all on Teams): Laura Ranker, Tom DeBell, Diana Butler, Craig Heindel, Liz Royer, Ben DeJong, Julia Boyles, Lydia Lee, Sille Larsen, Nathan Kie, Kira Jacobs, Scott Stewart, Kasey Kathan, Michael Nahmias, Reed Sims, Grahame Bradley, Meddie Perry, Thomas Akin, Erin Stewart

Speakers – Laura Ranker, Tom DeBell, Julia Boyles, Nathan Kie

A) **Mobile Home Parks Above Ground Storage Tanks Project** – Laura Ranker and Tom DeBell

Tom DeBell (VDH) and Laura Ranker (DEC) presented together on their work to secure aboveground storage tanks and protect source protection zones in mobile home parks. The goal with this project is to help mobile home parks become more resilient to natural disasters by taking steps to prevent contamination to their drinking water supplies. Mobile home parks were disproportionately affected by Tropical Storm Irene, with 15% of mobile homes in the state with damage verified by FEMA where mobile homes comprise 7% of VT's total housing.

Last fall a Pilot project was run at the Berlin Mobile Home Park. This park is prone to flooding and the expectation was that they'd find above ground storage tanks that needed to be secured. Surveys and door to door assessments of ASTs helped spread word of the project and enroll residents. Of the 21 tanks that needed flood prevention work, 15 were approved by the owners to be secured.

After the pilot project a prioritization plan was created to identify other parks that would benefit from this service. Three factors were taken into consideration: first the parks flood risk, second ACCD park information and third Source Protection Area assessment. The Source Protection Area assessment looked at the location of mobile home parks within Source Protection areas. Counts of mobile home parks within the three zone boundaries, separation distance between the nearest mobile home and the public water source, topographical location of source, well construction and maintenance of the park were all considered.

The Prioritization of MHPs found 21 at risk parks for flooding and of those 21, 10 parks were eligible based on the source protection assessment for funding from DWGPD. After further assessment two more parks were picked to receive this service Pownal Estates MHP and Weston MHP. Expansion on this work in the future would include more parks and more partners in the state getting involved. Overall, this was a great model for interagency collaboration within the State of VT.

Discussion after the presentation centered on funding to continue this project and the various places this could come from. A suggestion was made that this committee should have a representative on the federal emergency management board and that the GWCC should engage with the VT Emergency Management as well.

B) **Private Well Location Project Update** – Julia Boyles

Julia Boyles, DEC, presented an update on the private well location project. At the start of this project 90,000 wells needed checking. While reviewing 74,724 well records to date with a manual supervised workflow in GIS, over 23,000 wells have been more accurately located and 80 public water system well records have been identified. Currently 49% of private wells have been more accurately located in VT.

Next steps for this project include locating wells in Windsor County (13,000 records to review) and expanding previous lithology work from the well records by simplifying and revising the records. With revised lithology mapping with well records could be used to create bedrock cross sections, map glacial terrain and map overburden. The Committee discussed all the benefits of mapping with well record data and how it would benefit consultants, conservation planners and state regulators.

C) Underground Injection Control (UIC) Rule Change Overview – Nathan Kie

Nathan Kie, DEC, gave a broad overview of the major things that are being proposed for changes in the upcoming UIC rule update. This rule was last revised in 2014 and needs to be updated again for VT to retain its primacy. Major points for updates/changes include bringing back registration requirements, enforcement language to match federal regulations, ground surface discharges, emergency permitting, clearly defining wells, exemptions for discharge of treated water, and some minor things like fact sheets for permit renewals. Nathan invited anyone in the group to join the rule update meetings.

Next meeting either Thursday July 21st, 2022.

Securing Aboveground Storage Tanks, and Protecting SPA Zones in Mobile Home Parks

Tom DeBell

Environmental Health Engineer

Environmental Health, Vermont Department of Health

Laura Ranker

Source Water Protection Specialist

Drinking Water and Groundwater Protection Division, Department of Environmental
Conservation

Background

Support VTDigger

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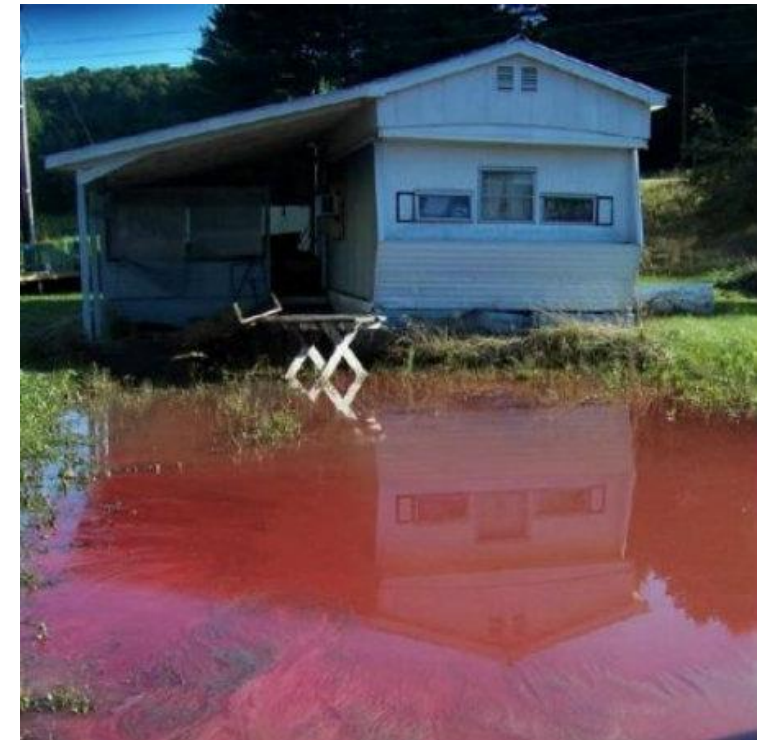
VTDIGGER

P PEOPLE & PLACES

Irene's major casualty: Vermont's mobile home parks

By Andrew Nemethy

Sep 14 2011

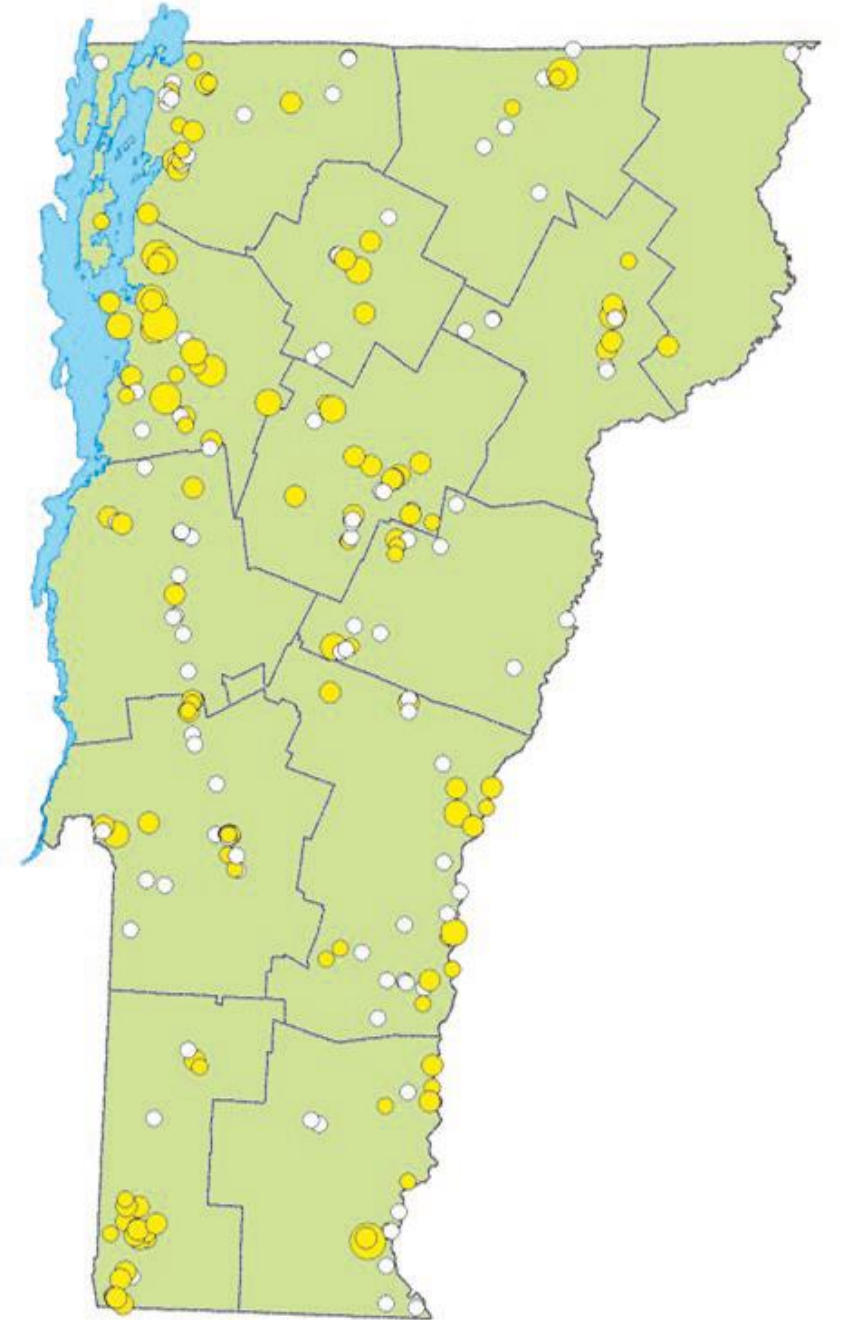


Background

Rapid Flood Exposure Assessment of Vermont Mobile Home Parks Following Tropical Storm Irene

Daniel Baker¹; Scott D. Hamshaw, S.M.ASCE²; and Kelly A. Hamshaw³

- # of Vermonters living in MHP's: 16,000 +
- # of Registered MHP in Vermont: 238
- # of parks at risk of Flooding: 67 +
- ~ 12% of mobile homes in Vermont are in floodplains.
- **15% of the homes with damage verified by FEMA were mobile homes despite comprising just 7% of the state's total housing stock.**



Background

Vermont to Use COVID Money to Move Vulnerable Mobile Homes

The state of Vermont is hoping to use \$5 million in COVID-19 relief funds to help buy out and move mobile homes in areas at risk of flooding.

By [Associated Press](#) | Oct. 11, 2021

STARKSBORO, Vt. (WCAX) - A new state program through Vermont Emergency Management is causing confusion at a mobile home park in Starksboro.

David Holt lives at the Lazy Brook Mobile Home Park. He and other park residents are under the impression the state is demanding eight mobile homes be moved due to potential flood risk, meaning those residents will need to find a new place to live.

"In the time I've been here, the flooding is down below not up here," Holt said. "But they've decided that these eight at the top here are going to have to go."

"We have nowhere else to go," Barbara Griffin said. "We've put all the rest of our money into it. We are on fixed incomes. That's it. This is where we were going to live for the rest of our lives."

Above Ground Storage Tanks

In August 2017, the Vermont Agency of Natural Resources adopted the Aboveground Storage Tank (AST) Rules

The AST Rules:

- Specify the standards for design, installation, and inspection of all AST systems
- Require existing AST systems be inspected
- Prohibit delivery to non-compliant AST systems (Red-Tagging)
- Establish requirements for new AST systems installed in flood prone areas

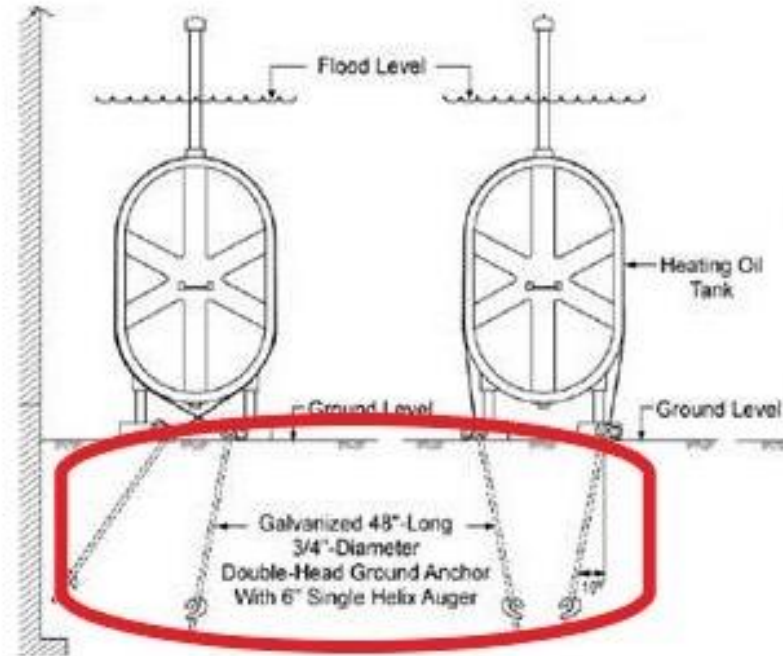


Pilot

Foot Flanges



Concrete Anchors

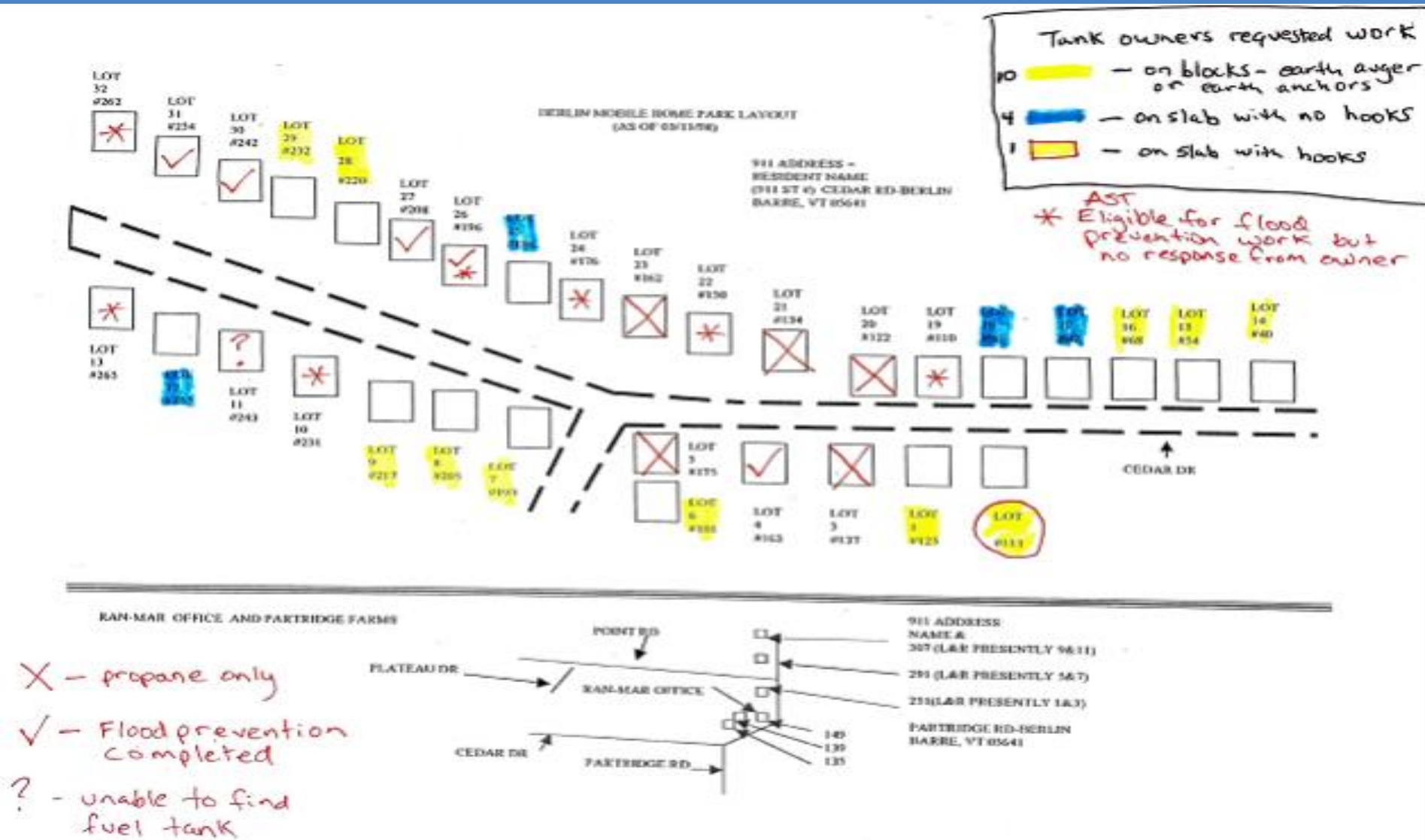


Earth Augers





Needs Assessment and Initial Survey



Enrollment and Survey



Berlin Pilot study Eligibility and Engagement Statistics

Total Number of Lots: 33

- 26 lots had above ground storage tanks (79%)
- 7 lots had propane (21%)

- 5 tanks already had flood prevention completed (19%)
- 21 tanks needed flood prevention work (80%)**

Outreach stats on 21 ASTs needing flood prevention work

- 6 AST owners did not approve work (29%)
- 15 AST owners approved work (71%)
 - 10 AST approvals were via survey response
 - 5 AST approvals were via site walkover

Findings




Additional Funds

AGENCY OF NATURAL RESOURCES

Department of Environmental Conservation

SEARCH

CONTACT

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PFAS & Drinking Water Information

SOURCE WATER PROTECTION



Initial Budget From CDC
Grant: \$36,500

EPA/DEC Vermont
Drinking Water State
Revolving Fund:
\$50,000

Total Budget: \$86,500

Ranking Additional Parks

MOBILE HOME PARKS WITH LOTS SUSCEPTIBLE TO FLOOD HAZARDS										Fluvial Erosion Hazard / River Setback				Estimated Number of Lots by Hazard			
MHP	Mobile Home Park Name	County	Town Name	Flooded during 2011	Highest Flood Hazard Area of Lots in Park	Highest FEH Zone of Lots in Park	Highest Flood Hazard Area of Land in Park	Floodplain Data Source	Total Lots in Park	FEH Zone	% of Lots	River Buffer	% of Lots	Floodway	% of Lots	100 Year Floodplain	% of Lots
311	Smith's Way	Bennington	Bennington	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	13	4	100%	1	25%	0	0%	4	100%
233	Willows Mobile Home Park	Bennington	Bennington	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	46	3	13%	0	0%	0	0%	0	0%
54	Burdick and Burdick Trailer Park	Bennington	Pownal	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	14	1	6%	0	0%	14	88%	14	88%
150	Forest Dale Mobile Home Park	Rutland	Brandon	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	4	5	100%	2	40%	4	80%	4	80%
154	Berlin Mobile Home Park	Washington	Berlin	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	0	11	37%	32	100%	0	0%	0	0%
176	Patterson MHP	Washington	Duxbury	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	24	4	21%	0	0%	24	100%	24	100%
307	99 North Main Mobile Home Park	Washington	Northfield	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	2	4	57%	1	14%	2	29%	2	29%
172	Tucker Mobile Home Park	Washington	Northfield	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	30	1	3%	1	3%	30	94%	30	94%
61	Glen Park	Windham	Brattleboro	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	19	9	39%	14	61%	19	83%	19	83%
248	Wilkins Trailer Park	Windham	Jamaica	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	10	1	14%	0	0%	10	100%	10	100%
42	Benson's Park	Windham	Rockingham	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	7	2	29%	1	14%	7	100%	7	100%
127	North Shore Trailer Park	Windham	Rockingham	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	21	12	57%	0	0%	21	100%	21	100%
204	Bunker Hill Community Co-op	Windsor	Windsor	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	20	0	0%	0	0%	20	100%	20	100%
155	River Run Mobile Home Park	Washington	Berlin	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	6	27	77%	28	80%	6	17%	6	17%
146	Alta Gardens Mobile Home Park	Bennington	Pownal	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	53	0	0%	0	0%	53	95%	53	95%
37	Black River Mobile Court	Windsor	Ludlow	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	6	4	27%	8	53%	6	40%	6	40%
143	Riverside Mobile Home Park	Windsor	Woodstock	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	8	15	38%	5	13%	8	20%	8	20%
15	Skunk Hollow Mobile Home Park	Windsor	Hartland	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	8	8	89%	0	0%	8	89%	8	89%
118	Brierwood Mobile Home Park	Franklin	St. Albans City	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	0	0	0%	0	0%	0	0%	0	0%
134	Weston Mobile Home Park	Washington	Berlin	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	48	14	17%	6	7%	48	58%	48	58%
13	Richards Mobile Home Park	Windsor	Bethel	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	13	0	0%	0	0%	13	62%	13	62%
52	Royal Pine Villa Mobile Home Court	Bennington	Pownal	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	25	7	23%	0	0%	25	81%	25	81%
206	Mears Mobile Home Park	Bennington	Arlington	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	4	0	0%	0	0%	4	80%	4	80%
6	Green Mountain Mobile Home Park	Bennington	Pownal	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	33	0	0%	0	0%	33	79%	33	79%
308	Millers Place	Rutland	Rutland	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	2	0	0%	0	0%	2	67%	2	67%
196	Riverview Estates	Caledonia	Lyndon	Yes	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	16	8	27%	3	10%	16	53%	16	53%
156	RMC Mobile Home Park	Washington	Berlin	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	0	7	30%	0	0%	0	0%	0	0%
56	Vernon Estates Inc.	Windham	Vernon	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	7	5	38%	0	0%	7	54%	7	54%
121	Highland Heights MHP	Lamoille	Johnson	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	21	0	0%	0	0%	21	46%	21	46%
215	Dorr Drive Mobile Home Park	Rutland	Rutland City	No	100 Year Flood Plain	Unknown	100 Year Flood Plain	DFIRM	2	0	0%	0	0%	2	12%	2	12%

Mobile Home Park Risk Assessment Tool

The risk assessment tool provides comprehensive information about mobile home parks in an Excel spreadsheet and includes selected park registry data, flood hazard information, water and wastewater systems, state permits and water system violations, and lot rent increase and vacancies. File will open in new window. Click Enable Editing to sort and filter. Change browser settings to open in Excel.

Updated with 2021 registration data, 2019 - 2020 public water supply violations, and municipal water source.

[Risk Analysis Tables \(.xlsx\)](#) * last update 1/18/2022

Email [Mobile Home Park Update](#) for any updates or corrections. Please include your name, MHP ID and name of park, and source of the information you are providing.

Prioritization from 3 Different Perspectives

1) Flood Risk

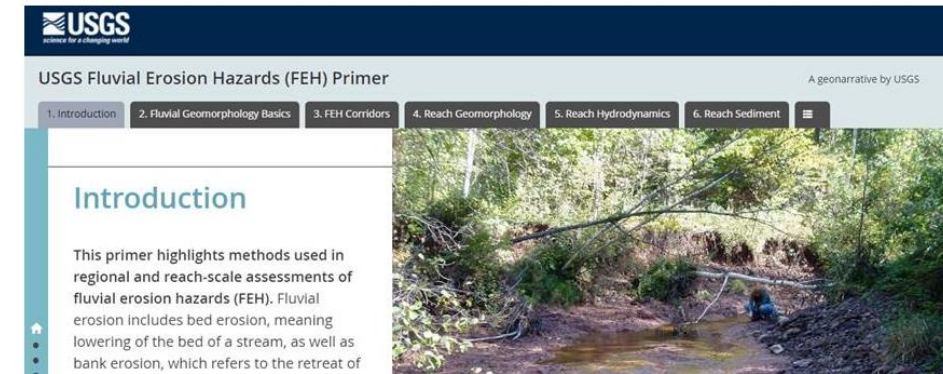
- a. 100-year Flood Plain
- b. Fluvial Erosion Hazard Index (FEH)
- c. Previous History of Flooding

2) ACCD Park Information

- a. Resident Owned Lots
- b. Willingness of Park owner
- c. Condition of park improvements and upgrades since Tropical Storm Irene

USGS Fluvial Erosion Hazards (FEH) Primer

By [Central Midwest Water Science Center](#)



MOBILE HOME PARKS

Mobile home parks provide an important source of affordable housing for about 7,000 Vermont households. Vermont law defines a mobile home park as any property with three or more mobile homes or mobile home lots. The Department has authority to enforce the State mobile home park act and administers rules for mobile home park leases, lot rent increases, sale or closure of mobile home parks, and habitability standards, and conducts an annual registration of Vermont mobile home parks. The Department serves as a resource on mobile and manufactured homes and park issues.

[Housing Division Rules](#)

Access the Department's Housing Division Rules for Mobile Home Parks and relevant Vermont Statutes.

[Residents](#)

Information and resources for mobile home owners and park residents.

[Park Owners](#)

Information and forms for park owners, annual park registration.

[Mobile Home Facts and Park Registry](#)

Information and reports about Vermont's mobile homes and mobile home parks, including annual Registry List and Detail Report. To register your park please go to the Park Owners page.

[Nonprofit and Resident Owned Parks](#)

Find available lots and current lot rent in Vermont's nonprofit and cooperative parks, updated periodically. For available lots in all parks see the park registry.

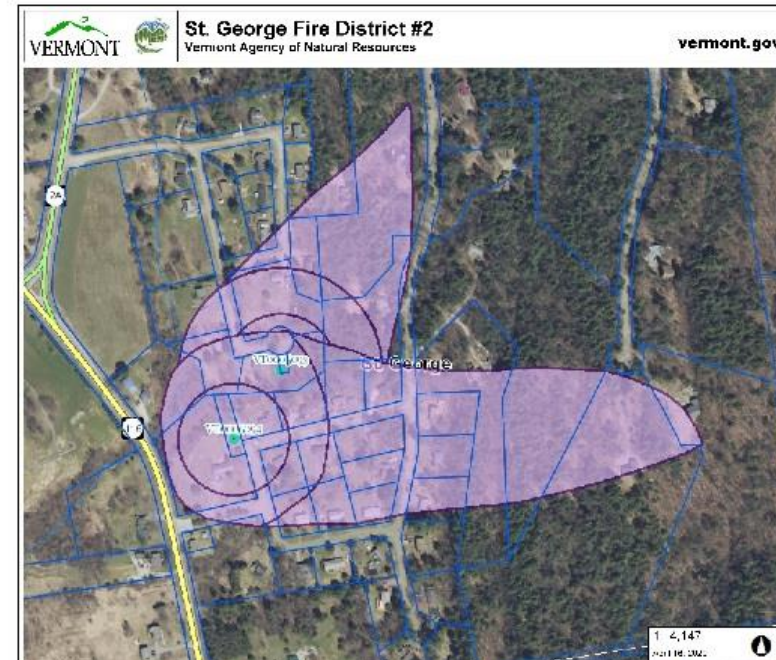
SPA Zone Ranking

MHP ID	MHP NAME	Location of MHP	SPA - Public Water System Name	SPA - Public Water System WSID #	Zone boundary	Laura Comments	Eligible	SPP/SPPU status	Flood Risk Ranking (Tom)	Arthur Comments
134	Weston Mobile Home Park	Berlin	Westons Mobile Home Park	VT0005258	Zone 2 & portion of Zone 3	Groundwater SPA wells WL002 and WL004	YES	SPPU - In review process	2	Resident owned cooperative. Park rebuilt after flooding in Irene destroyed 70 homes. Good candidate especially if newer AST not tied down.
146	Alta Gardens Mobile Home Park	Pownal	Alta Garden Estates	VT0005628	Zone 1,2, & 3	Groundwater SPA well WL001	YES	SPPU- pending review	3	New park owner in 2021 seems interested in being responsible. Name changed to "Pownal Estates". Might be a good candidate due to history of flooding.
238	River View Commons	Richmond	River View Commons	VT0005086	Zone 1 & 2	Groundwater SPA well WL002, WL003	YES	SPPU current	4	Park has out of state private owners. Not as familiar with this park or how many homes are in flood area.
6	Green Mountain Mobile Home Park	Pownal	Alta Gardens MHP	VT0005628	Zone 1, 2, & 3	Within GW SPA OF WSID 5628. Consecutive System-water purchased-Pownal FD 2 WSID 20734	YES	SPPU- pending review	8	One third of lots are vacant. Park owner owns and rents out 10 of 26 occupied mobile homes in the park. Adjacent to Pownal Estates. Not sure but may be good candidate if Pownal Estates is being done.
										Flooded in Irene. Under

Prioritization from 3 Different Perspectives

3) SPA Assessment*

- a. Location of MHP within a Source Protection Area
- b. # of mobile homes located within zone 1
- c. the separation distance from the mobile home to the public water source
- d. # mobile homes located in Zone 2 and Zone 3 areas
- e. Source Protection Plan status
- f. Topographical location of water source(s), soils, well construction and depth, etc.
- g. Maintenance and repair of Mobile Home Park

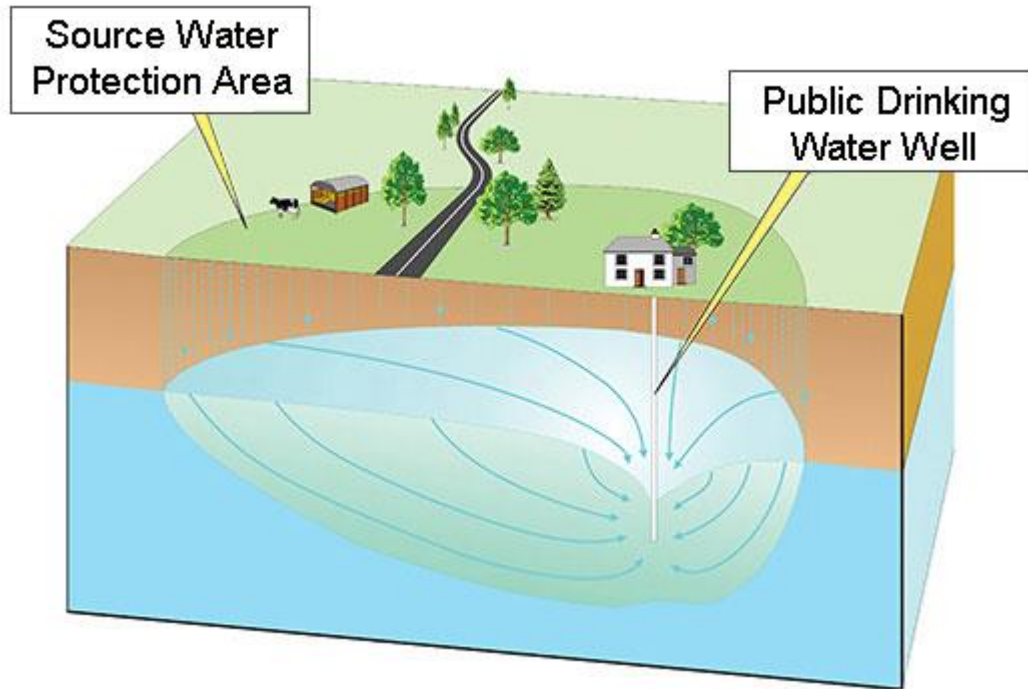


Park Prioritization

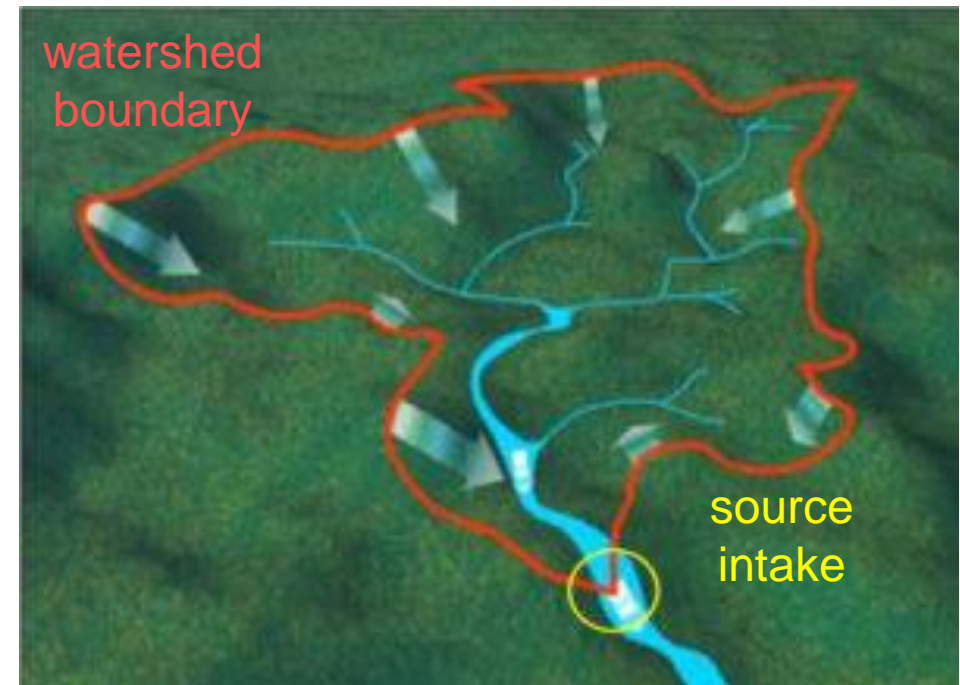
- 21 At Risk Parks for Flooding identified
- Ten eligible parks out of the 21 based on SPA and SPP criteria for DWGPD funding
- Prioritize 2-3 of the top ten parks with further assessment criteria
 - ▣ Proximity to Berlin MHP Pilot Project – Contractor Availability and interest
 - ▣ Willingness and capacity of Park Owner participation
 - ▣ Flood vulnerability / history of flooding
 - ▣ SPA risk assessment - # units within zone 1, 2, & 3. Zone 1 critical area.
 - ▣ Survey responses
 - ▣ # of Homeowner owned units (non rental units)

What is a Source Protection Area

Source Protection Areas (SPA's) are areas through which contaminants are reasonably likely to reach a public water system source



Groundwater SPA



Surface Water SPA

Source Protection Area (SPA)

Surface Water

A Surface Water SPA is the watershed area contributing surface water and groundwater flow to the drinking water intake.

Groundwater

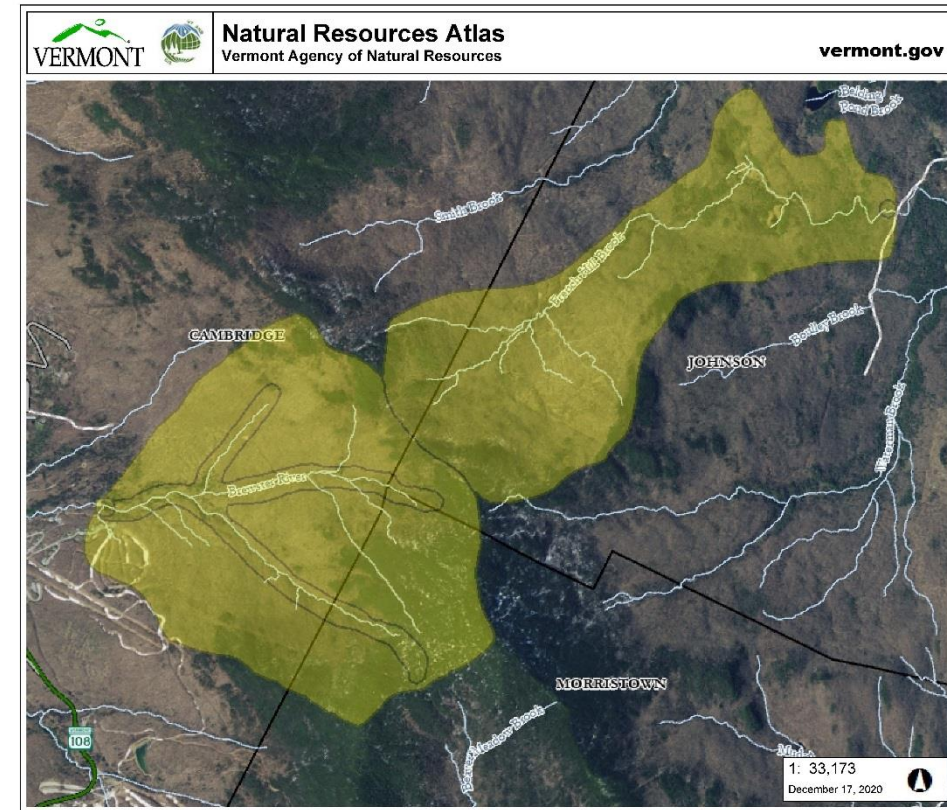
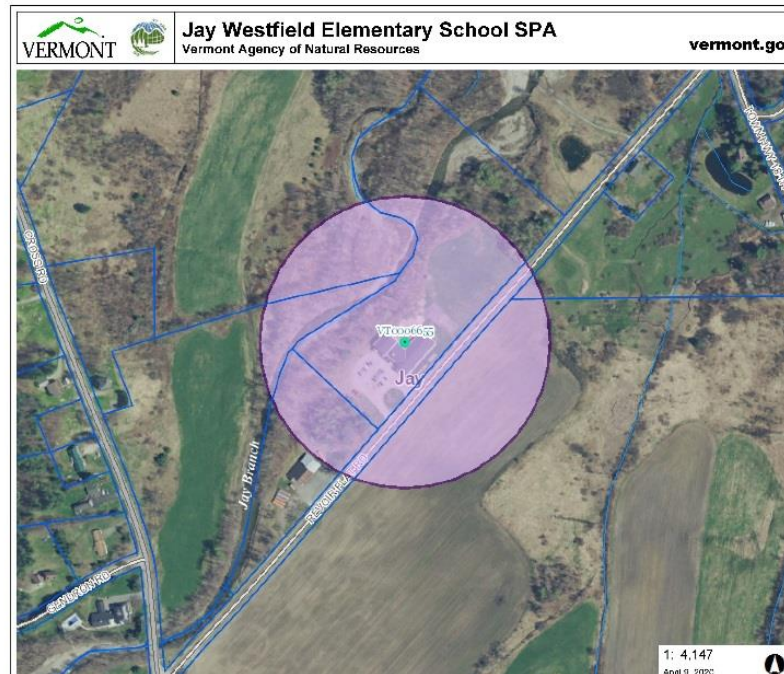
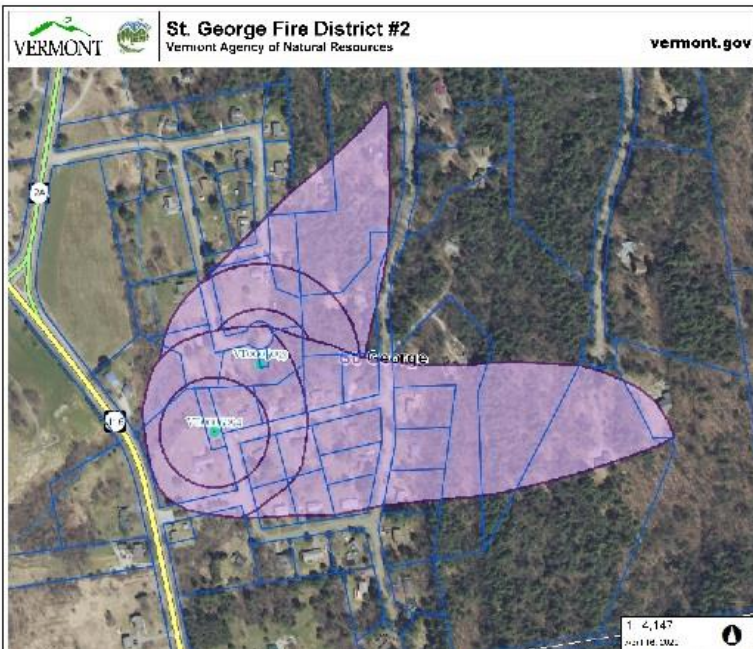
A Groundwater SPA is the land area beneath which groundwater flows to a well, spring, or infiltration gallery. A contaminant released to the land surface or subsurface in a Groundwater SPA would be reasonably likely to move toward, and reach, the drinking water source.

Well head Protection Area (WHPA) = Source Protection Area (SPA)

Source Protection Area Delineation

Delineation defines the area of land in which activities are likely to impact the quality of a drinking water source

Establishes boundaries....



SPA - Groundwater Delineation

Community Groundwater Systems

- Delineation created using existing geologic and hydrogeologic data, and pumping test data
- Established Zones

Non-Transient Non-Community Groundwater Systems

- The SPA boundaries are determined by using the fixed-radius-circle calculation method found in Protecting Public Water Sources in VT, A Guidance Document, 1997:
Section 4.3.2 NTNC Source Delineation.

- Calculation is based on Maximum Daily Demand (MDD)
- No Established Zones
 - Minimum set back to land uses
 - Minimum distance to Potential Sources of Contamination (PSOC)

* NTNC can choose to delineate the SPA using hydrogeologic methods

MDD of Source (gpm)	Radius of Proposed SPA (feet)
0 - 4.9	500
5 - 19.9	1000
20 - 49.9	2000
50 - 99.9	2500
100 or greater	3000

Source Protection Area Delineation

Community Groundwater Water Systems

ZONE BOUNDARIES DEFINED

- **Zone 1** is the area immediately around the water source. This is the area where impacts from contamination are likely to be immediate and certain. For public community water systems, this area is generally **200'** around the well, spring, or infiltration gallery. "Isolation Zone"
- **Zone 2** includes the area where groundwater flows to the source from outside Zone 1 and where there would be probable impacts to the water supply if contamination were to occur. "Primary Recharge Area"
- **Zone 3** consists of the remaining area that recharges Zone 2 and where impacts from potential sources of contamination are possible. This is usually, but not always, the area upslope from Zone 2 to the watershed boundary. "Secondary Recharge Area"

The **Two Year Travel Time Zone** is identified as an area where bacteria and virus threats (such as those from onsite disposal of sewage) would reach the drinking water source in less than two years by traveling through the soils. Two years is the time it takes most viruses to die off or become non-infectious in a groundwater environment.

Source Protection Area WSID VT0005628

Pownal Estates
Mobile Home
Park, LLC

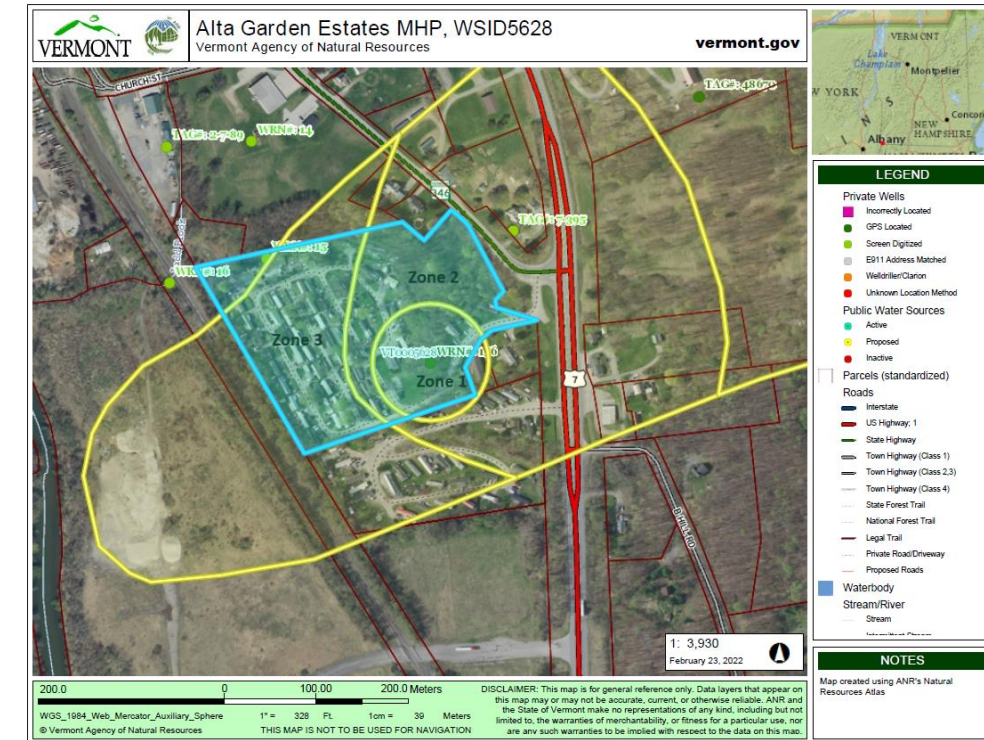
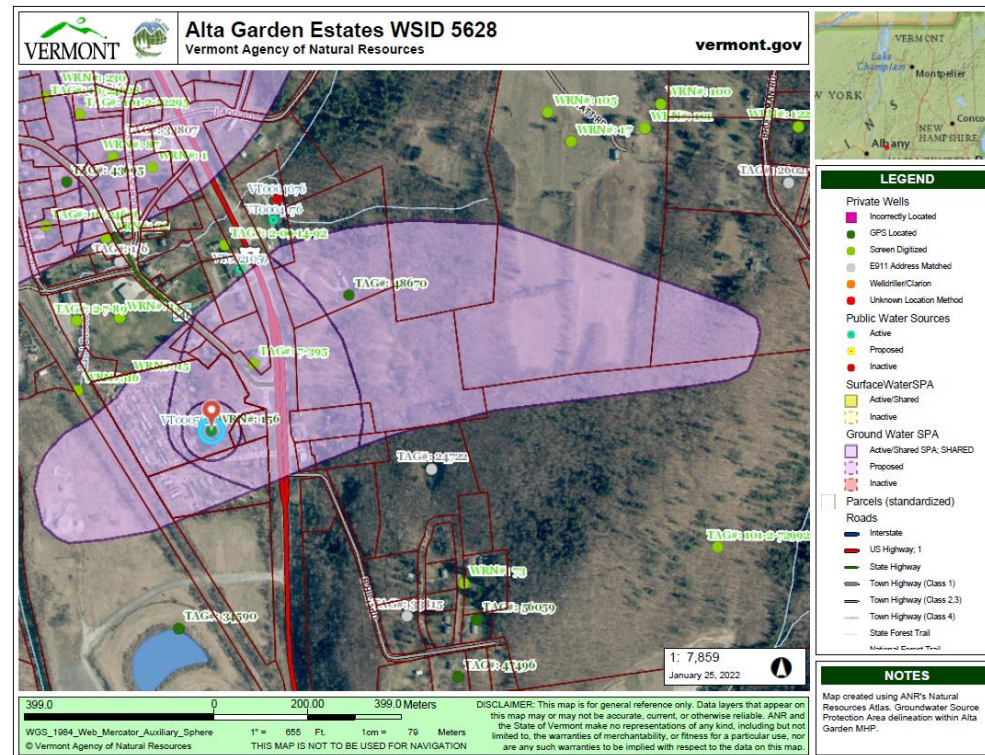
Public Community
Water System –
WSID VT0005628

GW SPA

Zone 1 - 5 mhs

Zone 2 - 12 mhs

Zone 3 - 39 mhs

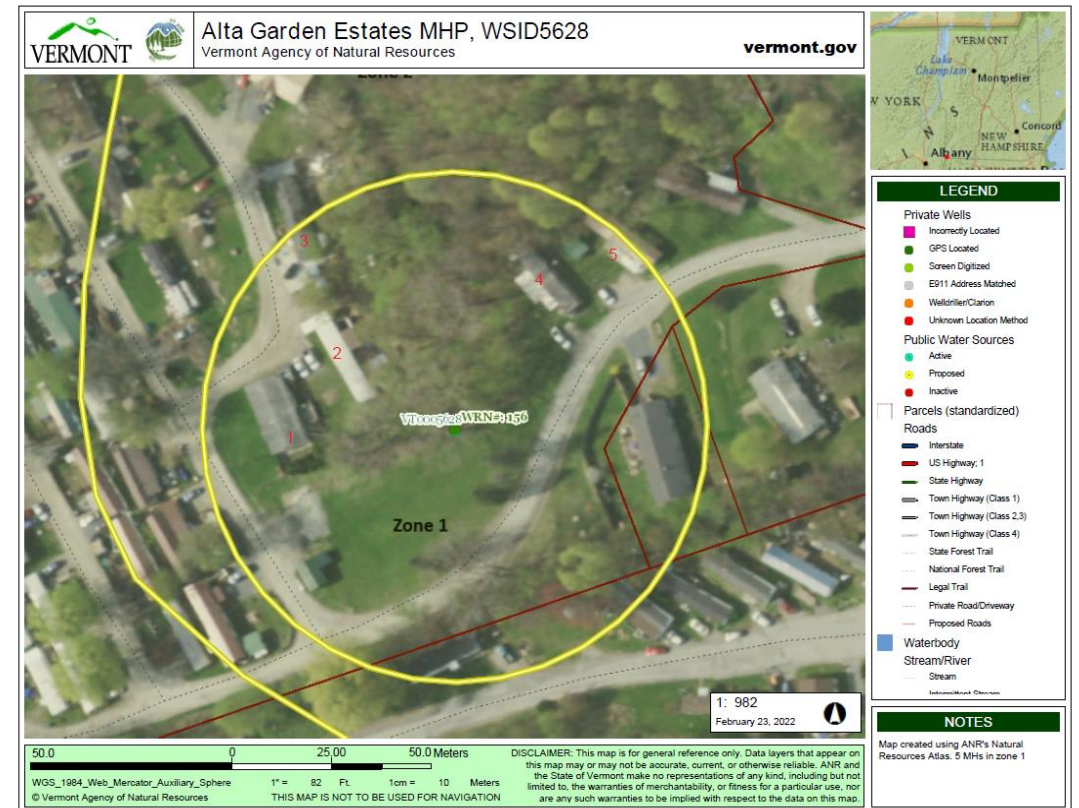


ASSESSING RISK WITHIN THE SPA

Questions to Consider

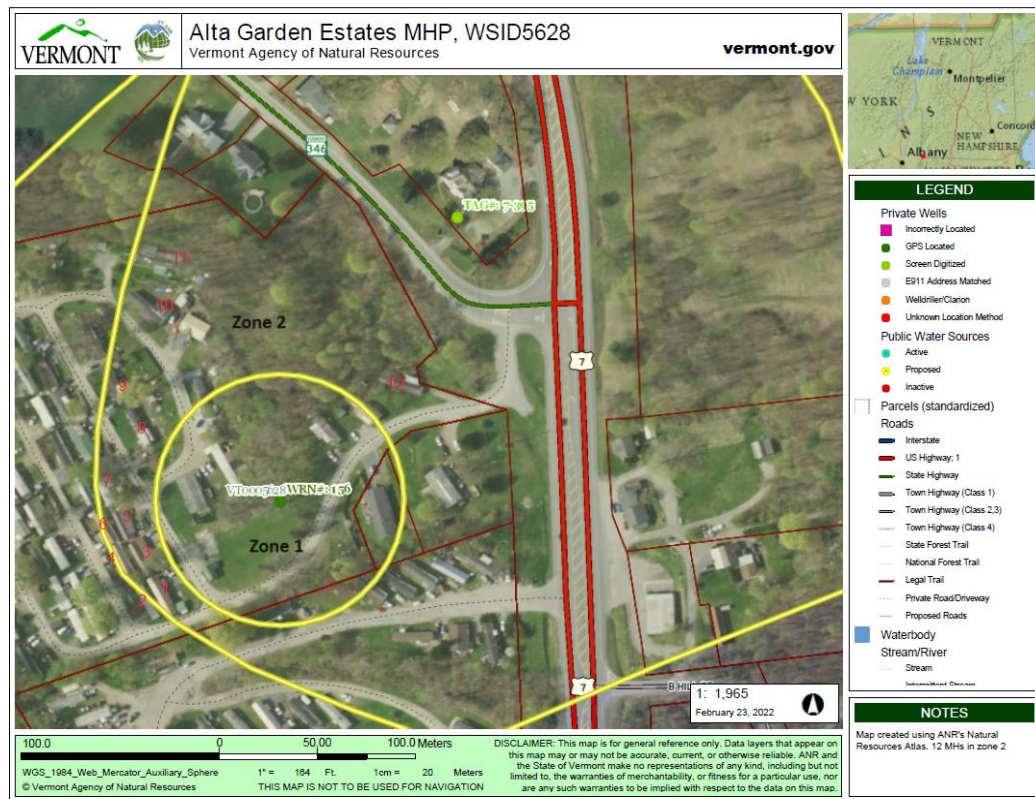
- ❑ Is the mobile home park located within a Source Protection Area(s)? Entirely or Partially?
- ❑ Is the mobile home park served by its own public water system?
- ❑ Where are the public water sources located?
- ❑ What is the nature of the source? GW or SW? Depth? Construction – casing, sealed, grouted?
- ❑ What is the distribution of mobile homes within each of the zone boundaries of the SPA?
- ❑ What is the distance of the mobile home(s) to the source well(s)? Other factors -topography, soils, etc.?
- ❑ How well maintained is the park? Is the park owner present?

Zone 1 area – 5 mobile homes in zone.
Impacts immediate and certain

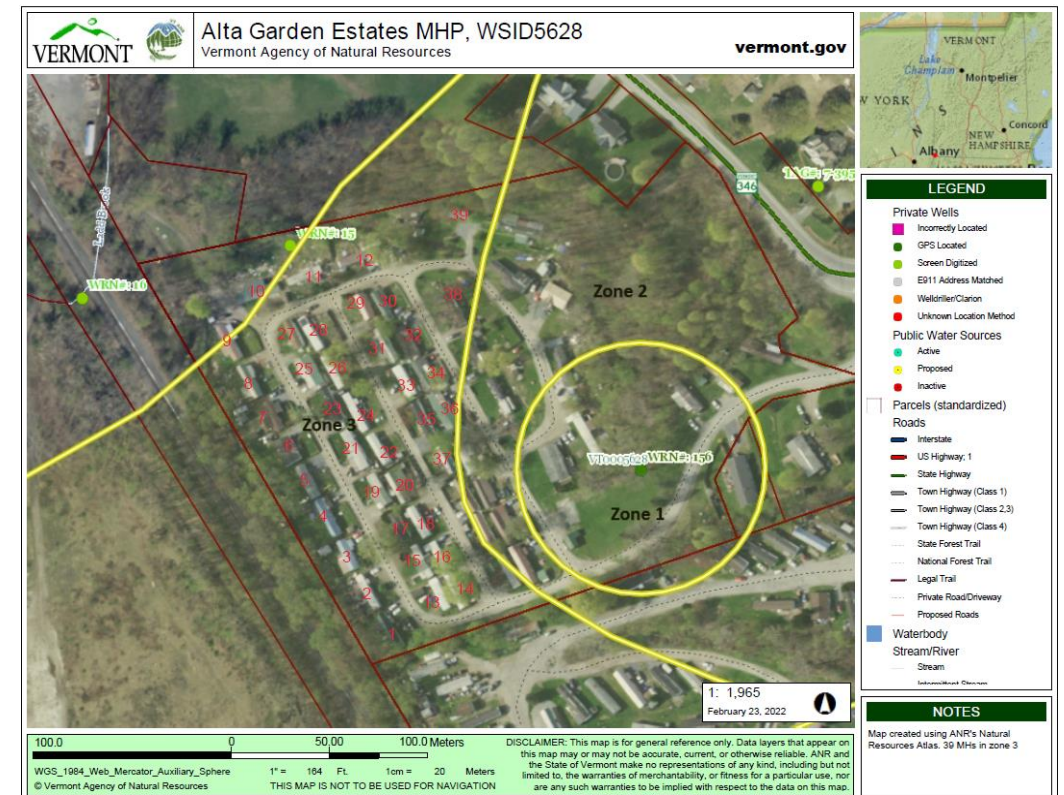


Pownal Estates Mobile Home Park, LLC

**Zone 2 area – 12 mobile homes in zone.
Impacts Probable**



**Zone 3 area – 39 mobile homes in zone.
Impacts Possible**



Source Protection Area WSID VT0005258

Weston Mobile Home Park

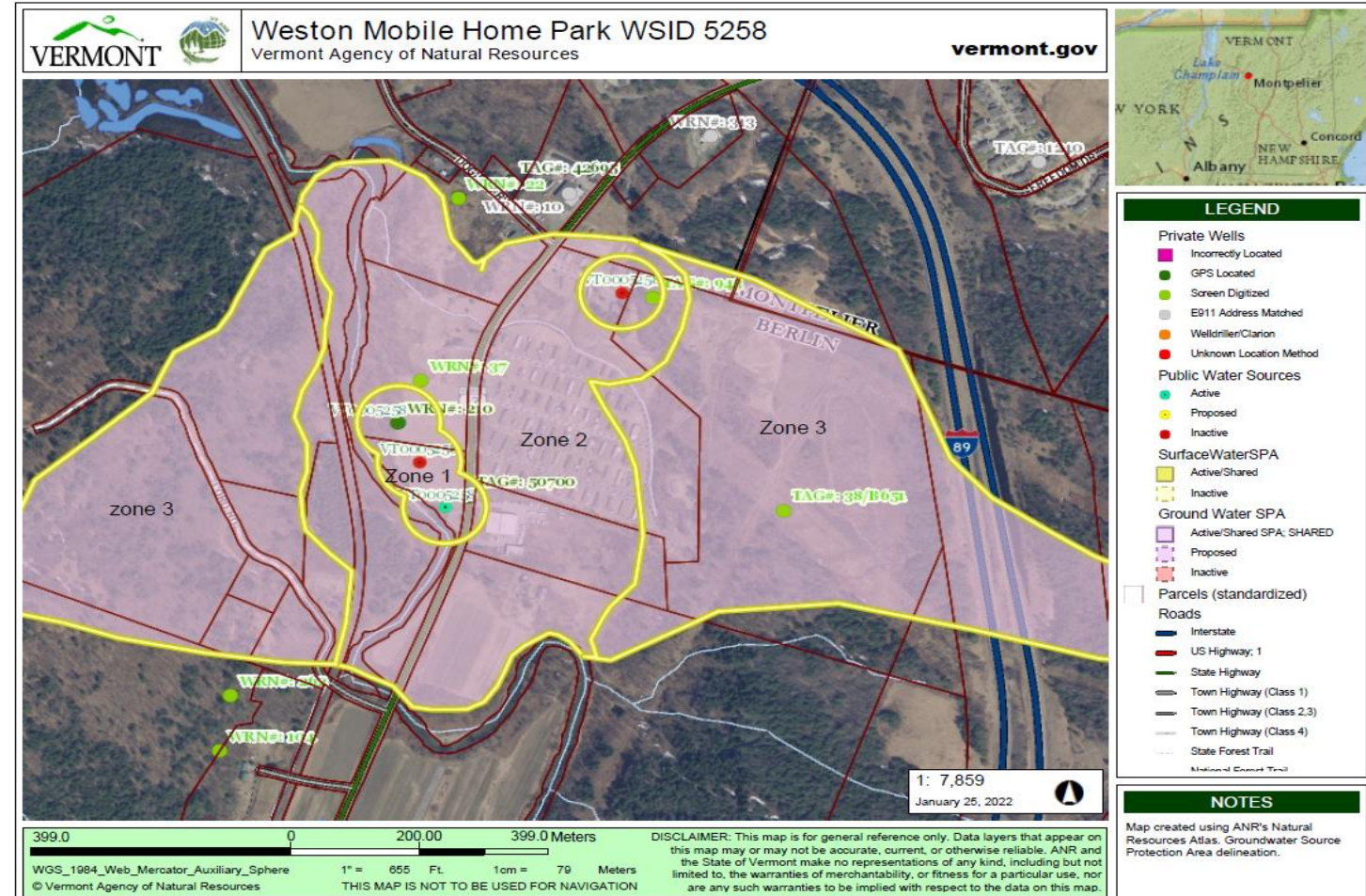
Weston Mobile Home Park Public Community Water System, WSID VT0005258

GW SPA

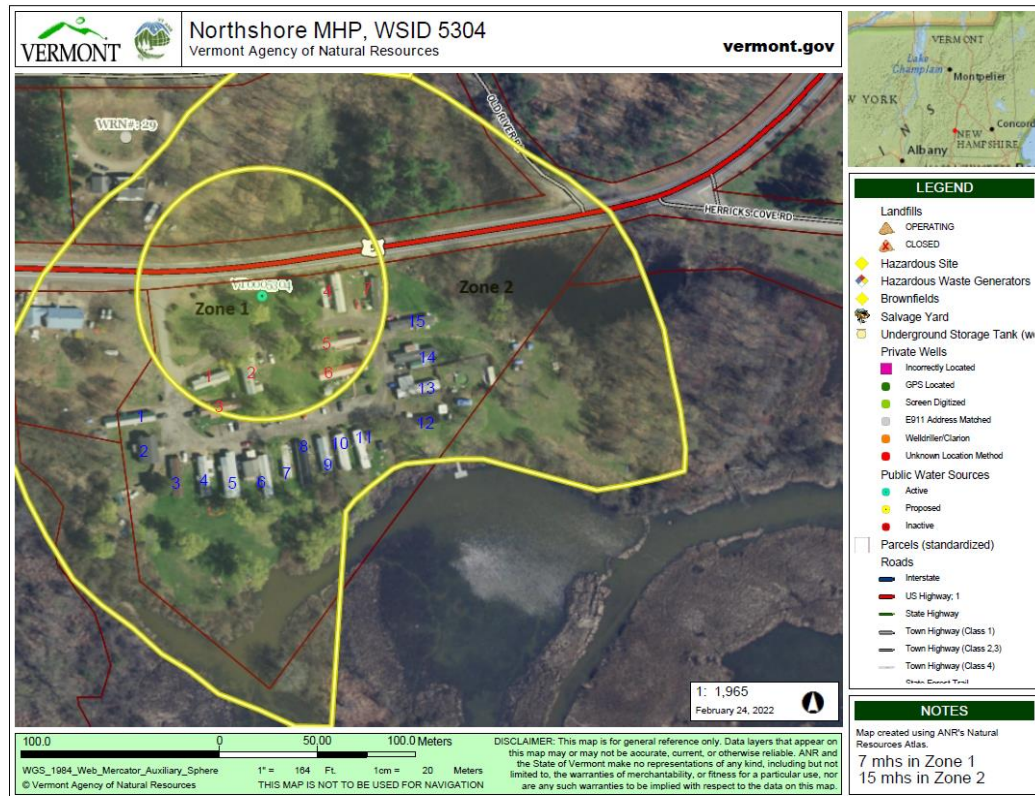
Zone 2 – 72 mhs

Zone 3 – 9 mhs

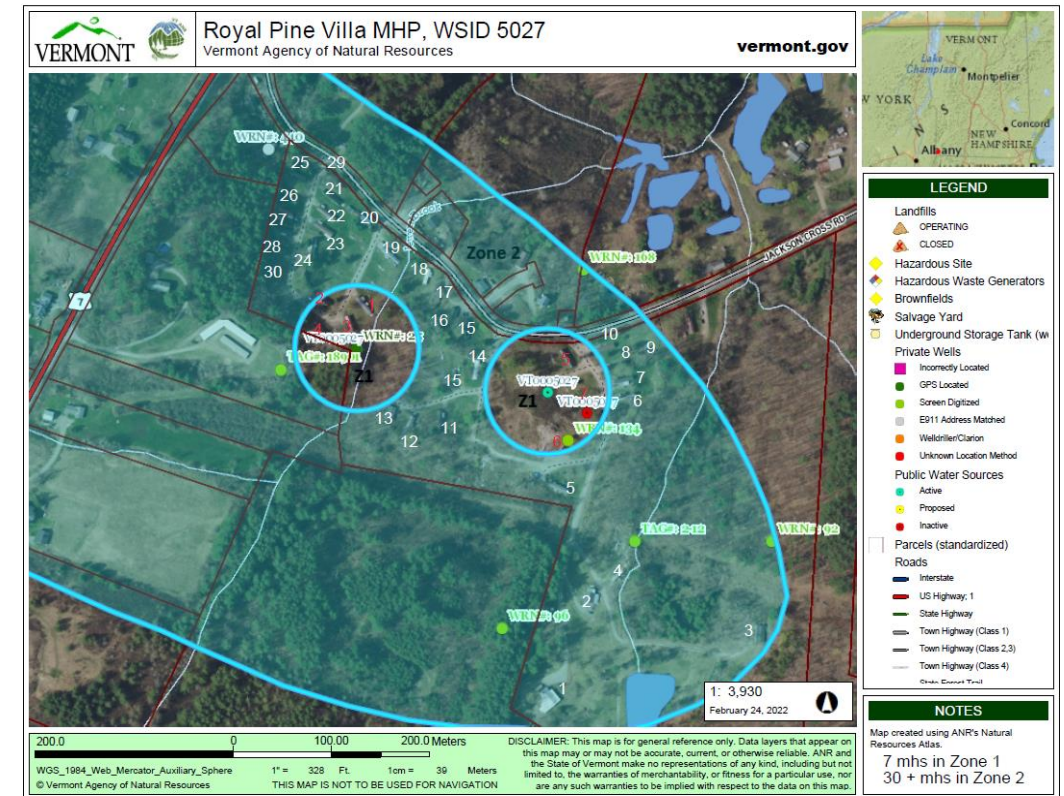
Located in Berlin, VT



Other Factors affecting SPA prioritization



Out of state owner; uncertainty of park owner participation.



Park Owner owns $> \frac{1}{2}$ of the mobile homes (rentals) and park has no history of flooding.

Final Park Prioritization

MHP ID	MHP NAME	Location of MHP	SPA - Public Water System WSID #	SPP/SPPU status	Flood Risk Ranking (Tom)	Arthur Comments	Laura Notes	Zone 1	Zone 2	Zone 3	# Lots	Final Rank
154	Berlin Mobile Home Park	Berlin	5272	none	9	N/A	N/A	N/A	N/A	N/A	33	In progress
146	Alta Gardens Mobile Home Park	Pownal	05628	SPPU-pending review	3	New park owner in 2021 seems interested in being responsible. Name changed to "Pownal Estates". Might be a good candidate due to history of flooding.	Entire MHP is located within the SPA. Concern with MHs in Zone 1	5	12	39	56	1
134	Weston Mobile Home Park	Berlin	V+E2:J7T00 05258	SPPU - In review process	2	Resident owned cooperative. Park rebuilt after flooding in Irene destroyed 70 homes. Good candidate especially if newer AST not tied down.	Entire MHP is located within the SPA	0	72	3	75	2
238	River View Commons	Richmond	5086	SPPU current	4	Park has out of state private owners. Not as familiar with this park or how many homes are in flood area.	Entire MHP is located within the SPA	0	120	0	120	3

Final Park Prioritization

~# Eligible Lots (Non-Propane) (78%)	~ # Need Flood Prevention (80%)	~ # Approved Work (Lots estimated to accept funding) (70%)	~ # Potential Pad Needed (66%)	~ # Total Tank Replacement (6%)	
26	21	15	10	2	Berlin Mobile Home Park
44	35	25	17	3	Alta Gardens Mobile Home Park
59	47	34	22	5	Weston Mobile Home Park
95	76	54	35	7	River View Commons

Estimated Costs for Use of Funds

Total Budget	Average cost for securing Tank	Cost of Pad	Cost of tank replacement
\$86,500	\$480	\$400	\$2,400

Totals (+ Berlin)	Estimated # Lots	Estimated # Pads	Estimated # Tank Replacements	Securing Tank Costs	Pad Costs	Tank Replacement Costs	~ Grand Total
Top 3:	127	84	17	\$60,999	\$33,550	\$17,210	\$111,759
Alta Gardens + Weston	73	48	10	\$35,225	\$19,374	\$9,938	\$64,537
Alta Gardens	40	26	5	\$19,116	\$10,514	\$5,393	\$35,023

Ground Survey Findings for Pownal Estates

Pownal (Formally Alta Gardens) MHP		Needs				
Applicant Street Address	Jaymi/Matt Comments	New Tank	Slab	Hooks	Tie Downs	Other
[REDACTED]	Tank replacement/pad/eye bolts/tie downs	X	X	X	X	Fuel transferred from old tank to new
[REDACTED]	Needs eye bolts and tie downs			X	X	
[REDACTED]	Tank replacement/pad/eye bolts/tie downs	X	X	X	X	
[REDACTED]	Needs pad/eyebolts/tie downs		X	X	X	
[REDACTED]	Tank replacement/pad/eye bolts/tie downs	X	X	X	X	
[REDACTED]	Tank replacement/pad/eye bolts/tie downs	X	X	X	X	
[REDACTED]	Tank replacement/pad/eye bolts/tie downs	X	X	X	X	
Note: 38 additional tanks were in need of work and did not respond. Some of which moved to electric heating						
Totals:		5	7	8	8	2

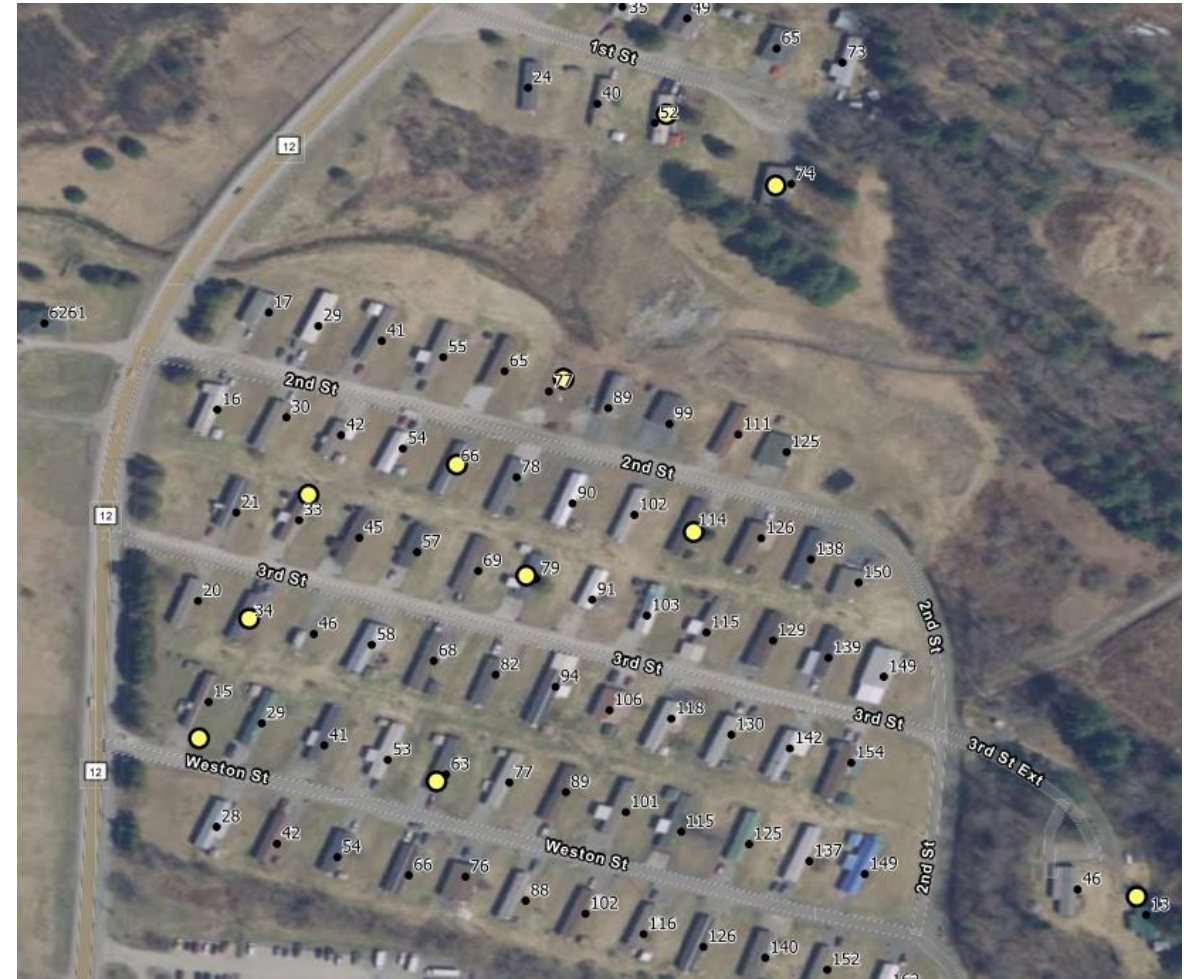
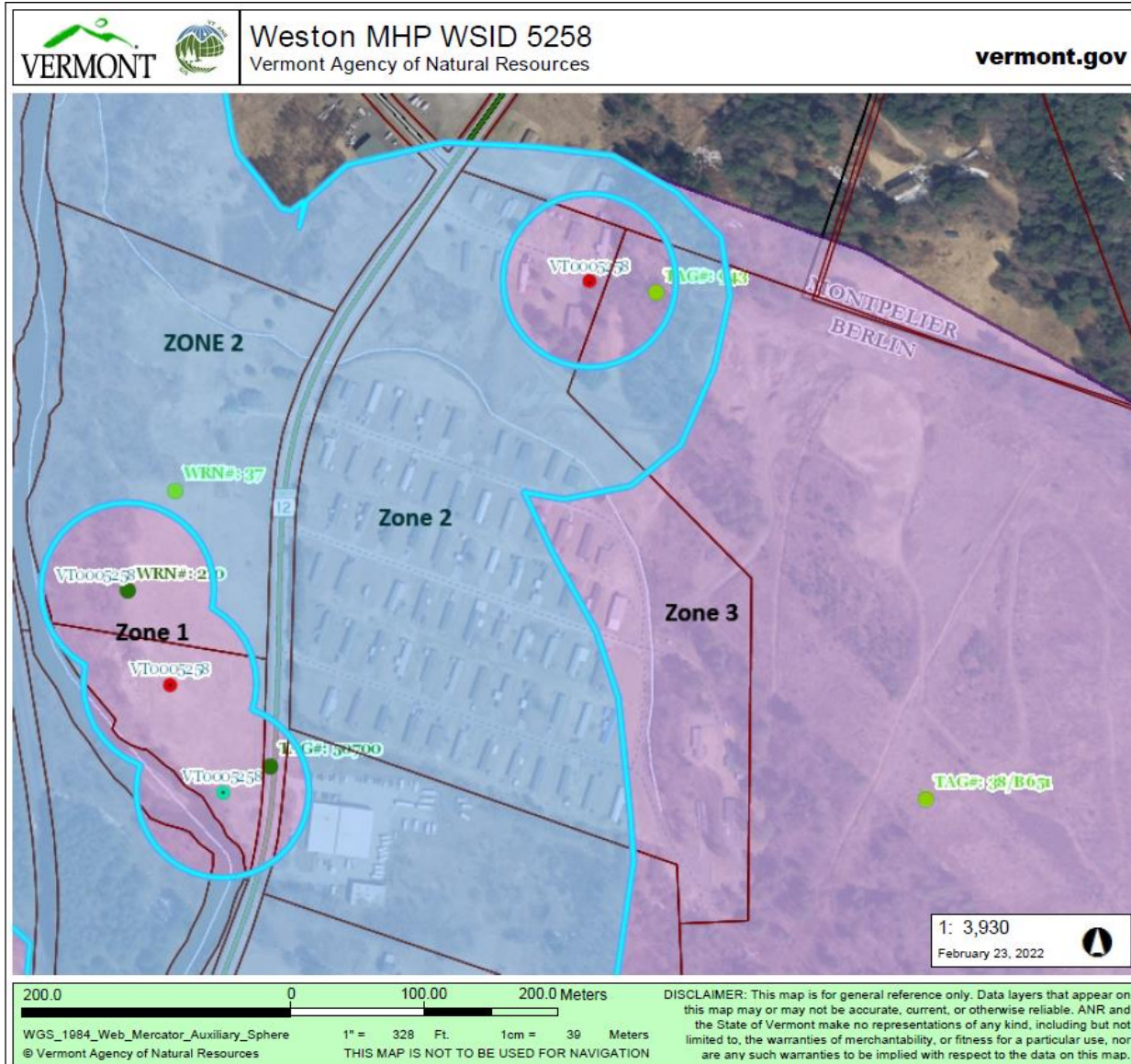
Category	Percentage
Green	10%
Blue	90%



Ground Survey Findings Weston MHP

Weston MHP		Needs				
Applicant Street Address	Moderator Comments	New Tank	Slab	Hooks	Tie Downs	Other
[REDACTED]	On slab, with hooks, needs tie downs			X	X	
[REDACTED]	on Slab, with Hooks and Tie Downs, Possibly need new tank?	?				
[REDACTED]					X	
[REDACTED]			X	X	X	Tank needs to be moved
[REDACTED]	On Slab, needs hooks, tie downs				X	
[REDACTED]	New tank		?	?	X	
[REDACTED]					X	Tank legs need replaced
[REDACTED]	On Slab, has eye bolts, needs tie downs				X	
[REDACTED]	Only need tie downs				X	
[REDACTED]	On Slab, has eye bolts, needs tie downs				X	
<i>Note: An additional 8 units were in need of work, and did not respond</i>						
Totals Confirmed By Owner:		2	3	4	10	2

Weston MHP



Challenges

❑ Homeowner Participation

- ❑ Not all eligible individuals wanted to participate in the program

❑ Homeowner Response to Survey

- ❑ Difficult to get all needed information
- ❑ Some lacked internet, but were able to enroll via phone

	Work Needed			
	New Tank	Slab	Hooks	Tie Downs
Grand Total	9	20	26	33
Original Estimates	10	48	73	73

❑ Labor shortage/Lack of RFP Responses

- ❑ Specific kind of work = Specific kind of contractor
- ❑ Pivoting to have work done by those already under contract with DEC Spills team

❑ Time Period to spend funds

- ❑ Grant Ends at End of Summer

Future Parks

Expand on this work in the future

River View Commons

- 120 Mobile Homes
- All 120 MH are in the SPA, zone 2 - area of probable impact

Northshore Trailer Park

- History of flooding.
- 7 mobile homes are in close proximity to water source and in zone 1 area; impact immediate and certain.
- Remaining 15 mobile homes are in zone 2 area of SPA – area of probable impact.
- Under new out of state ownership, (son of Father who formerly owned park), participation uncertain.

Tuckers Mobile Home Park

- History of flooding.
- Stable ownership.
- 15 lots within SPA – 12 in zone 2 and 3 in zone 3.

Project Contributors

DEC, Waste Management and Prevention, Spill Team:

- Matt Moran
- Jaymi Cleveland
- Michael Nahmais

DEC, Drinking Water and Groundwater Protection Division

- Sille Larsen
- Laura Ranker

ACCD, Housing

- Arthur Hamlin, Housing Program Coordinator – Mobile Home Parks

USGS/UVM

- Scott and Kelly Hamshaw
- Daniel Baker

VDH, Private Drinking Water Program

- Bridget O'Brien
- Anna Gallagher
- Dan Jarvis
- Tom DeBell

QUESTIONS?

**Call: 802 951 5790/802 863 7233
or visit: healthvermont.gov/water**

Thank you for listening!

Private Well Location Project May 2022 Update

Julia Boyles

Vermont Geological Survey

Department of Environmental Conservation

Agency of Natural Resources

Outline

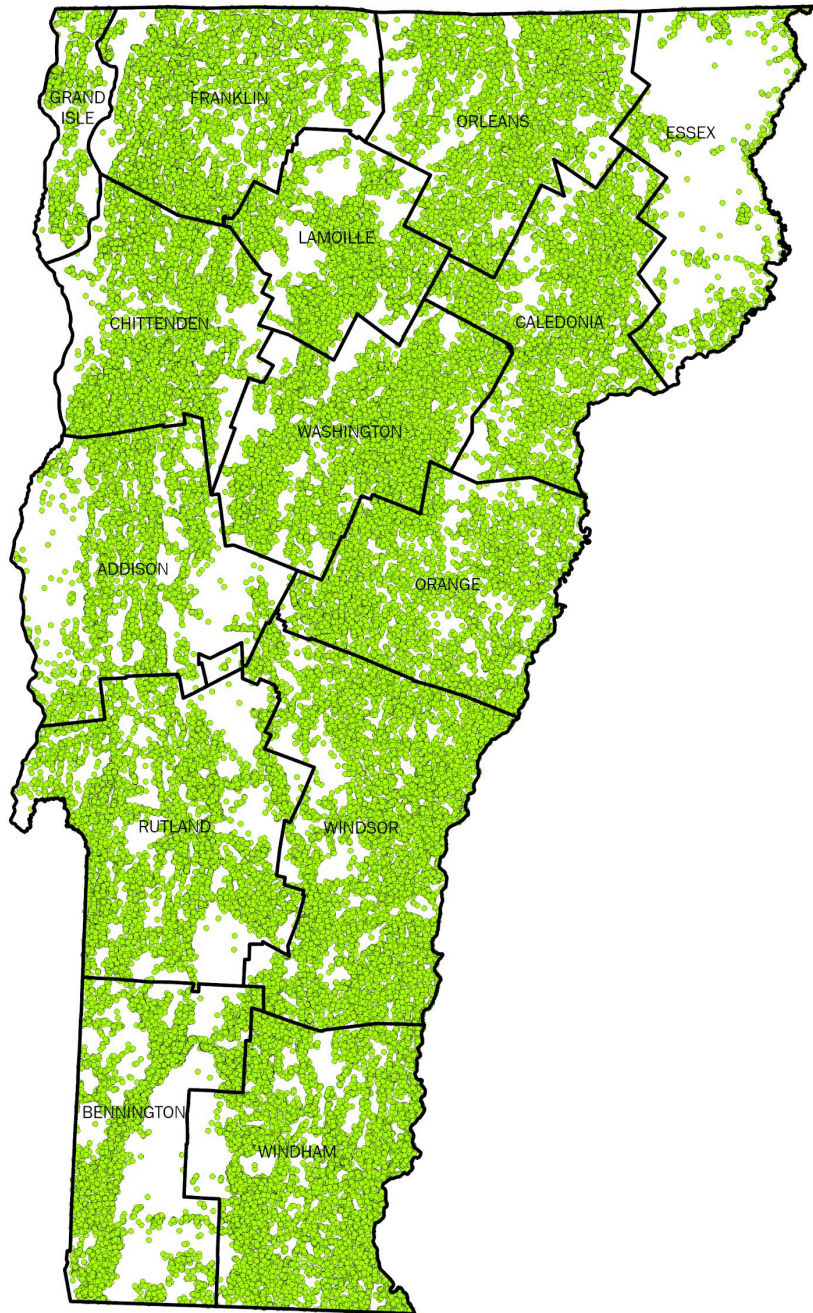
- Overview of dataset
- Well location tool
- Results
- Where to next?



Thanks to Colin Dowey, former VGS geologist/developer (now at ADS), for developing the well location tool and writing much of the code that made this work possible. Colin worked on this project from 2017-2019.



Funding from USGS Water Use and Data Research (WUDR) Program



Private Wells Database

- ~120,000 records in database since 1965
- At start, ~90,000 wells needed review
- “Located” wells = GPS *or* Enhanced 911 (E911) Address

How does the well location tool work?

Digital Well Record (GIS)

OWNER FIRST NAME	OWNER LAST NAME	DATE COMPLETED	DATE RECEIVED	WELL DEPTH (FT)	YIELD (GPM)	STATIC WATER LEVEL	OVERBURDEN THICKNESS	CASING LENGTH	GROUT TYPE	Well Use Code
John	Smith	7/15/2019	7/26/2019	123	34	<Null>	72	122	Type III Portland Cement	Domestic

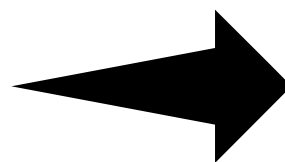
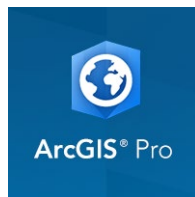
Grand List Tax Data (not in GIS)

277544	2004	Sunderland	63319910239	0805-	MICKEY MOUSE	123 MOUSE LANE
277545	2004	Sunderland	63319910240	0317-	JOHN SMITH	PO BOX 613
277546	2004	Sunderland	63319910241	0374-	BIG BIRD	123 SESAME ST

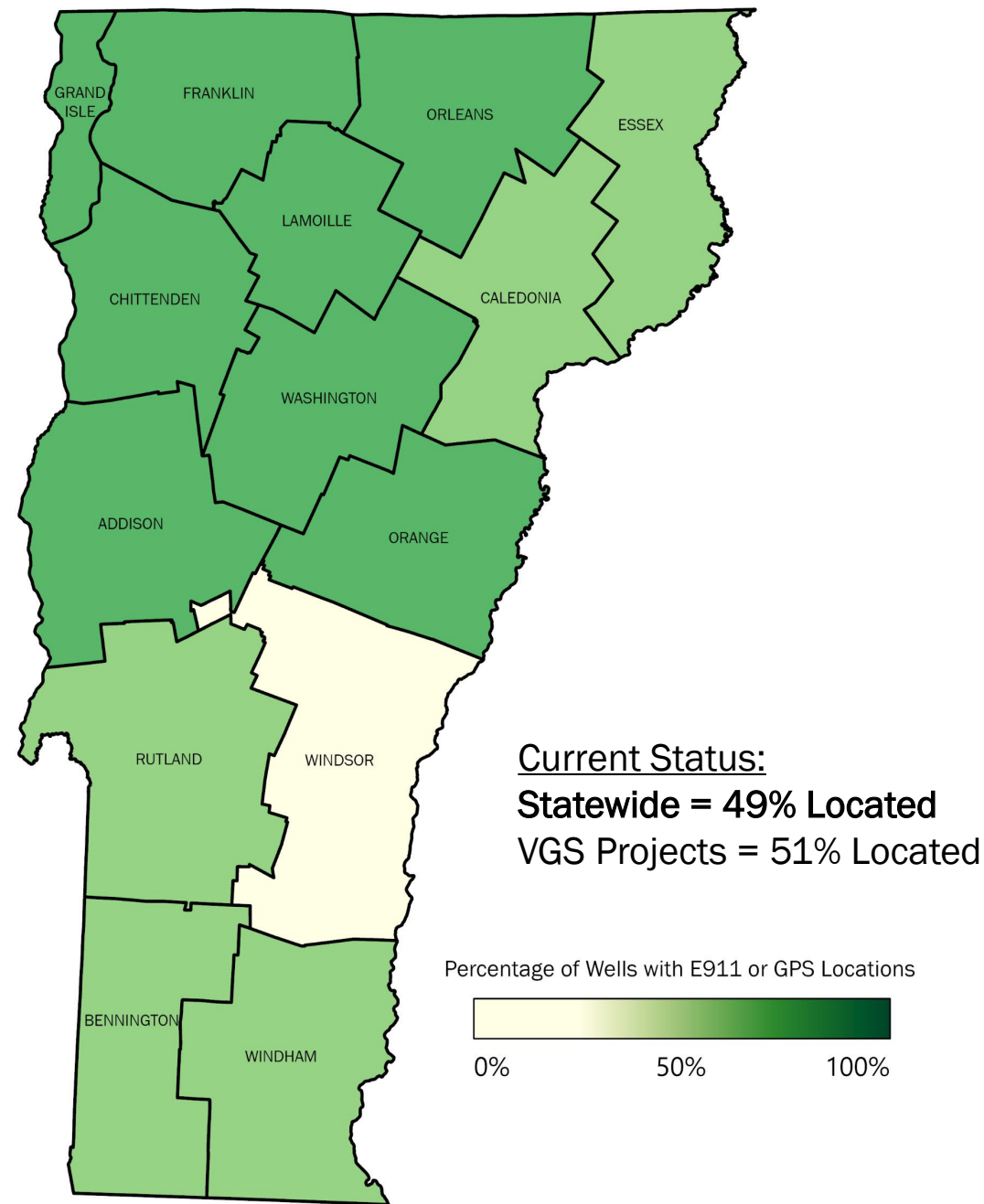
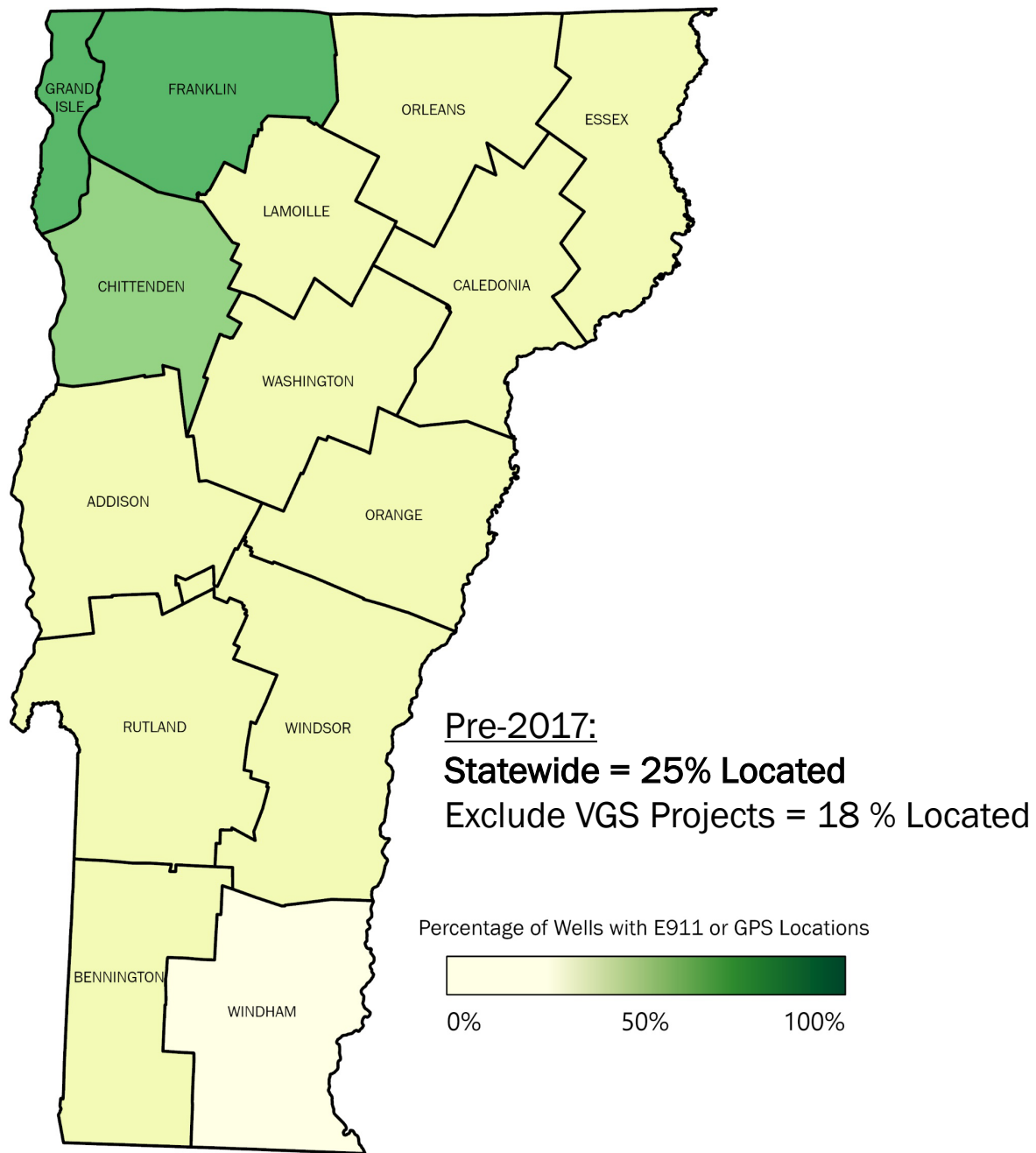
Digital Parcel Record (GIS)

OBJECTID	GIS SPAN	Grand List SPAN	MAPID	Parcel ID	PROPTYPE	GIS Year	Grand List Year	TOWN	Grand-List Town-Name
10657499	633-199-10239	633-199-10239	2090032	0805-	PARCEL	2017	2019	SUNDERLAND	Sunderland
10657500	633-199-10240	633-199-10240	0230165	0317-	PARCEL	2017	2019	SUNDERLAND	Sunderland
10657501	633-199-10241	633-199-10241	0230131	0374-	PARCEL	2017	2019	SUNDERLAND	Sunderland

Tools (links all three datasets in GIS)



Results

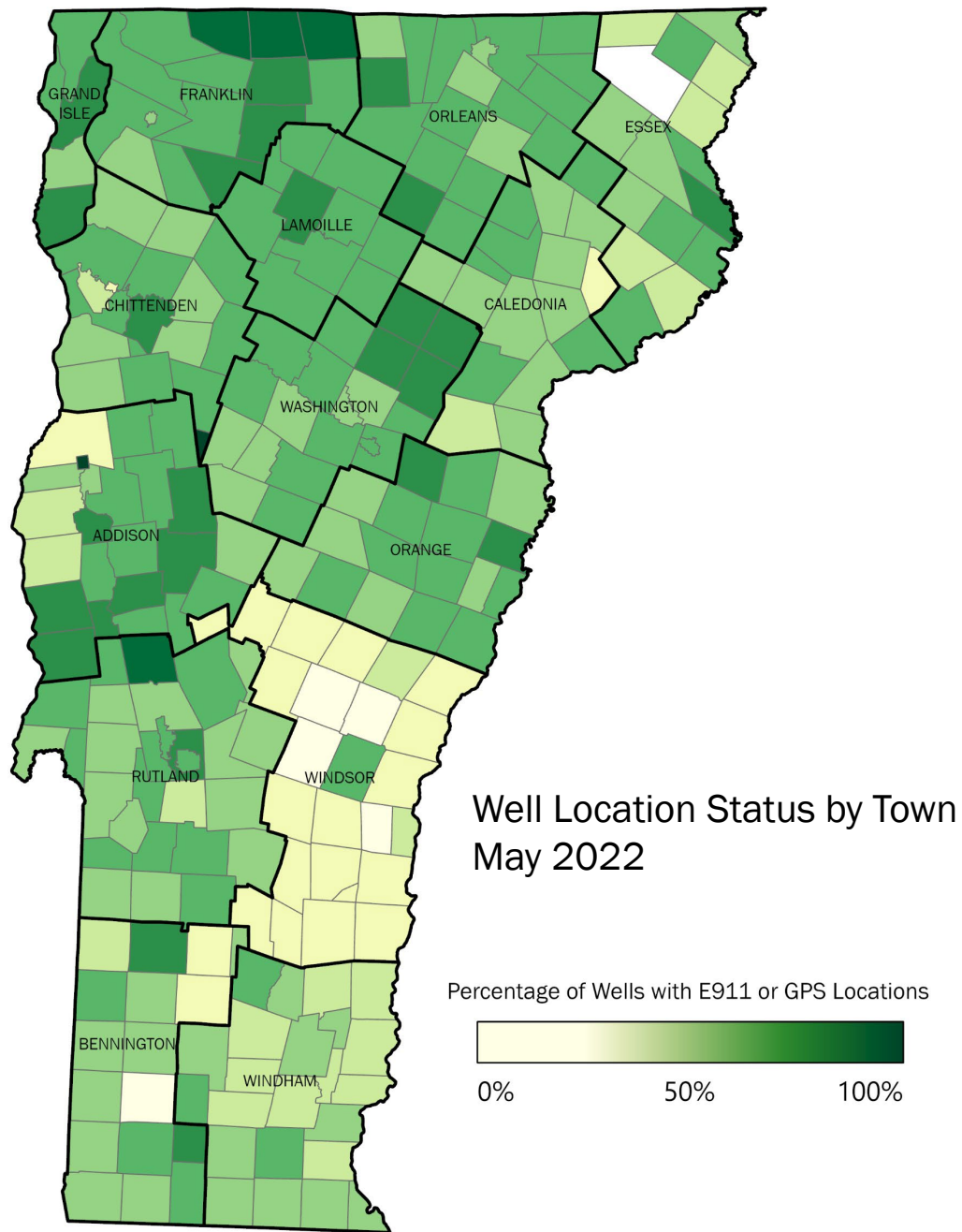




To date, VGS has:

- Reviewed 74,724 well records
- Located over 23,000 wells using the tool
- Identified > 80 Public Water System well records





Data Source: DWGPD Well Completion Report Database

Since the project began,

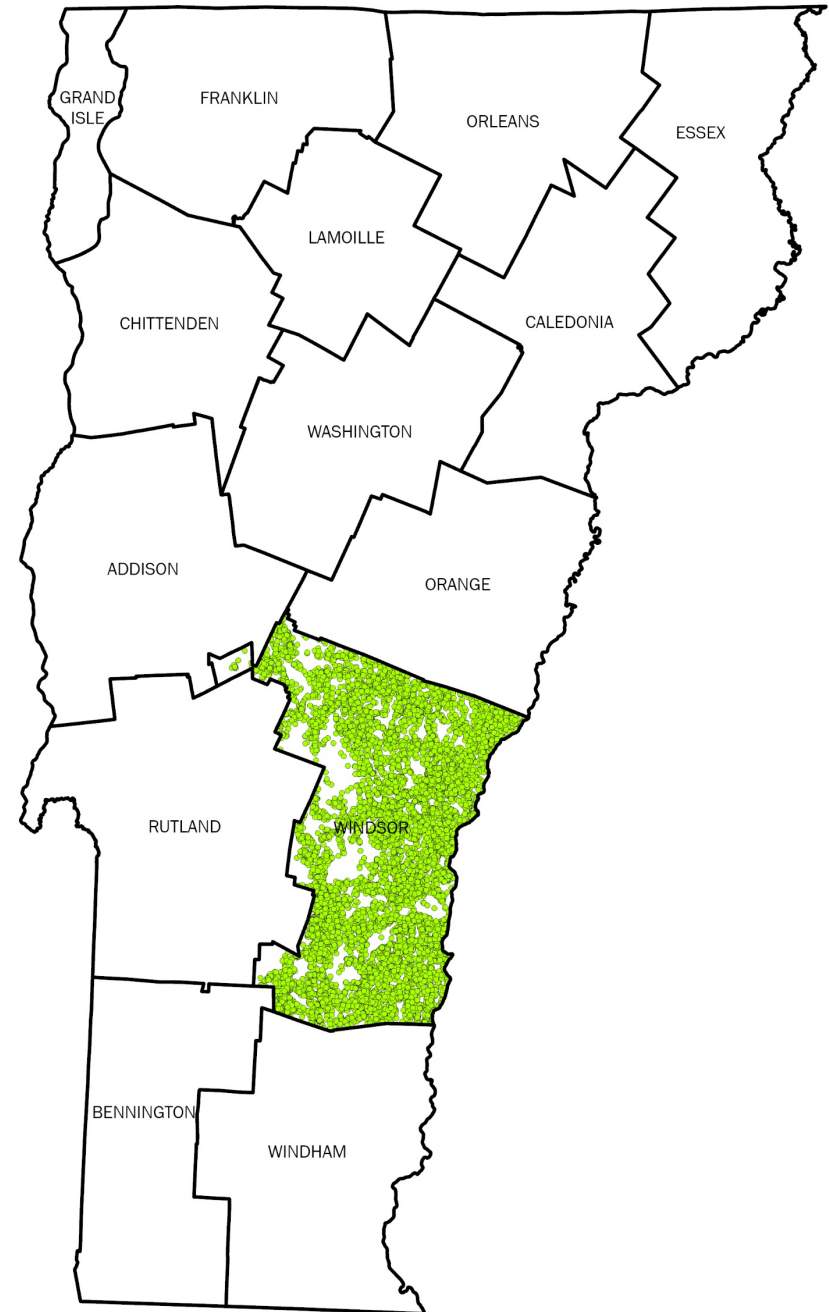
- % of located wells statewide has doubled
- Effectiveness of tool increased by > 2x due to improved data sources (standardized parcels)
- Improvements to well location tool and process always continuing, increasing efficiency

What the tool can do, and what it can't:

- Supervised workflow
 - Each well must be manually investigated
 - Some require more effort than others
- Can be subjective. Do we locate a well without 100% certainty?
Open question
- Some wells cannot be linked to their location without physical investigation (i.e., spec house, well driller only had builder's name, etc.)

Where to next?

- Thanks to DWGPD, can complete review > 13,000 records in Windsor County
- Expand previous lithology work?
 - Lithology logs already incorporated into the database
 - Needs revision and simplification, a big undertaking



Code	Description	LU_WellLithologyCodeID
B	Cobbles and boulders	1
BC	Clay and boulders	2
BG	Gravel and boulders	4
BI	Silt and boulders	6
BS	Sand and boulders	7
C	Clay	8
CG	Clay and gravel	9
CI	Clay and silt	10
CS	Clay and sand	11
D	Topsoil	13
G	Gravel	14
GI	Silt and gravel	17
GS	Sand and gravel	18
I	Silt	21
R	Rock, bedrock, ledge	25
S	Sand	26
SI	Silt and sand	29
OC	Ochre, orange/red oxide	33
TH	Dense till, hardpan	35

Overburden descriptors from
well completion form

RockType	LU_WellLithologyRockTypeID
Granite	1
Marble/limestone	2
Phyllite	3
Quartz/quartzite	4
Serpentine/talc	6
Shale/slate	7
Sandstone	8
Schist	9
Gneiss	10

Bedrock descriptors from
well completion form

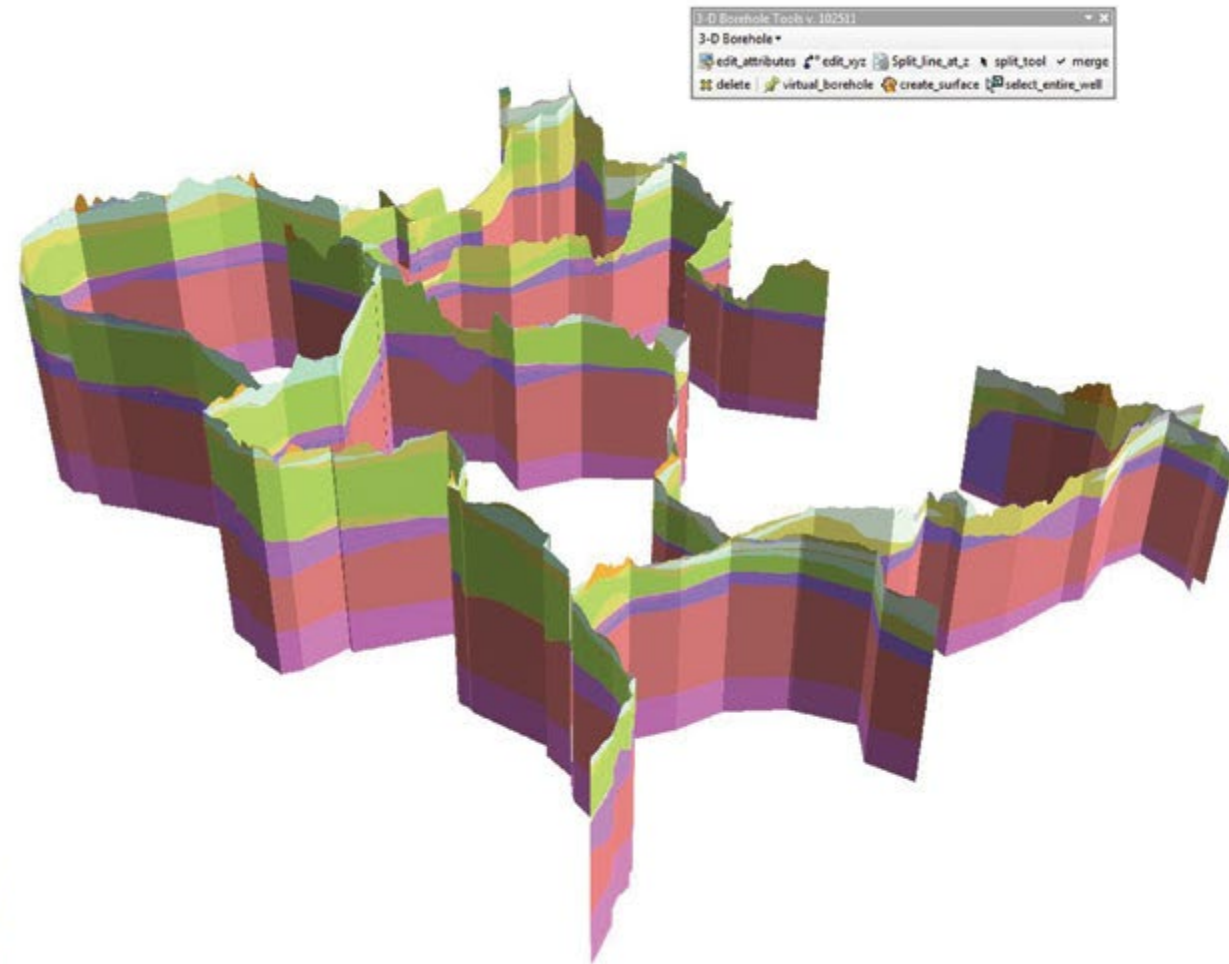
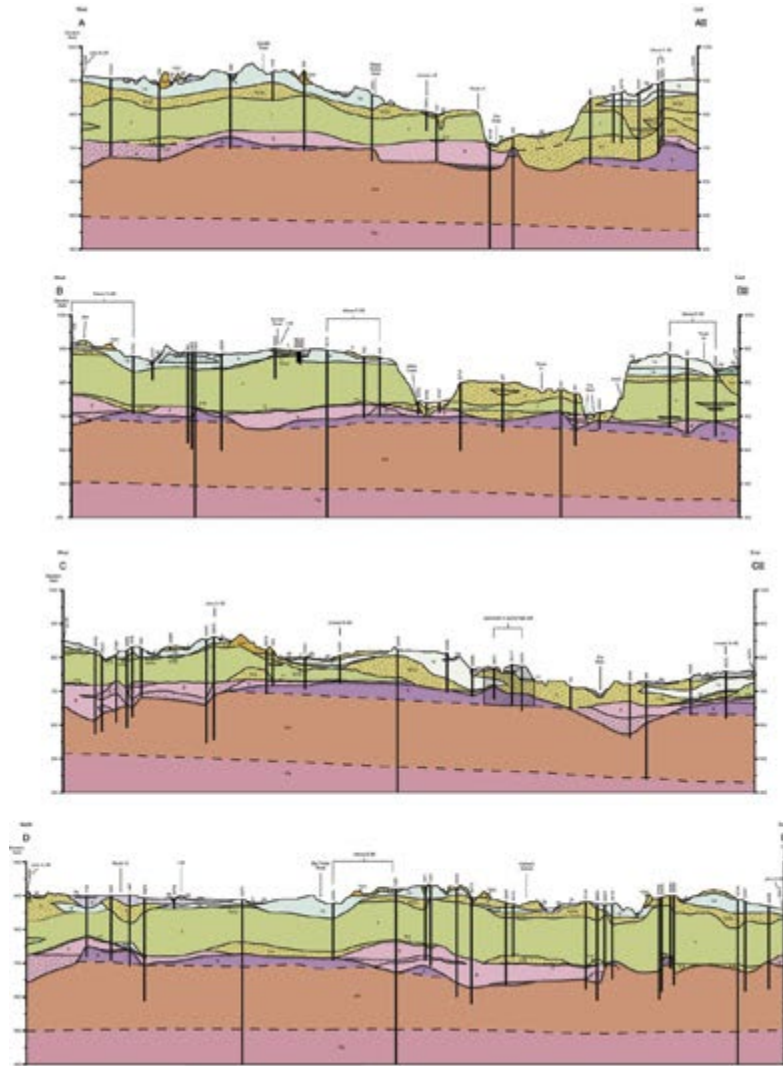
- How to take observed lithology from drillers and map to standard units?
- Geology and driller's observations don't always conform to standards

Tech glitches happen, would need to identify and fix for many thousands of records

WELL LOG		
From	To	Formation Information and Water Bearing Fractures
0	21	CLAY & GRAVEL VAIN BOULDER
21	23	HARD PAN
23	84	SAND
84	127	HARD PAN
127	168	HARD PAN
168	174	GRAVEL
174	204	HARD PAN
204	208	MED GRAY
208	233	MED GRAY
COMMENTS		
233	241	BROWNISH GRAY
241	440	MED GRAY
440	460	MED GRAY

StartingDepth	EndingDepth	LithologyDescription	LithologyCode
0	21	clay & gravel vain boulder	CG
21	23	<Null>	H
23	84	<Null>	S
84	127	<Null>	H
127	168	<Null>	H
168	174	<Null>	G
174	204	<Null>	H
204	208	med gray	R
208	233	med gray	R
233	241	brownish gray	R
241	440	med gray	R
440	460	med gray	R

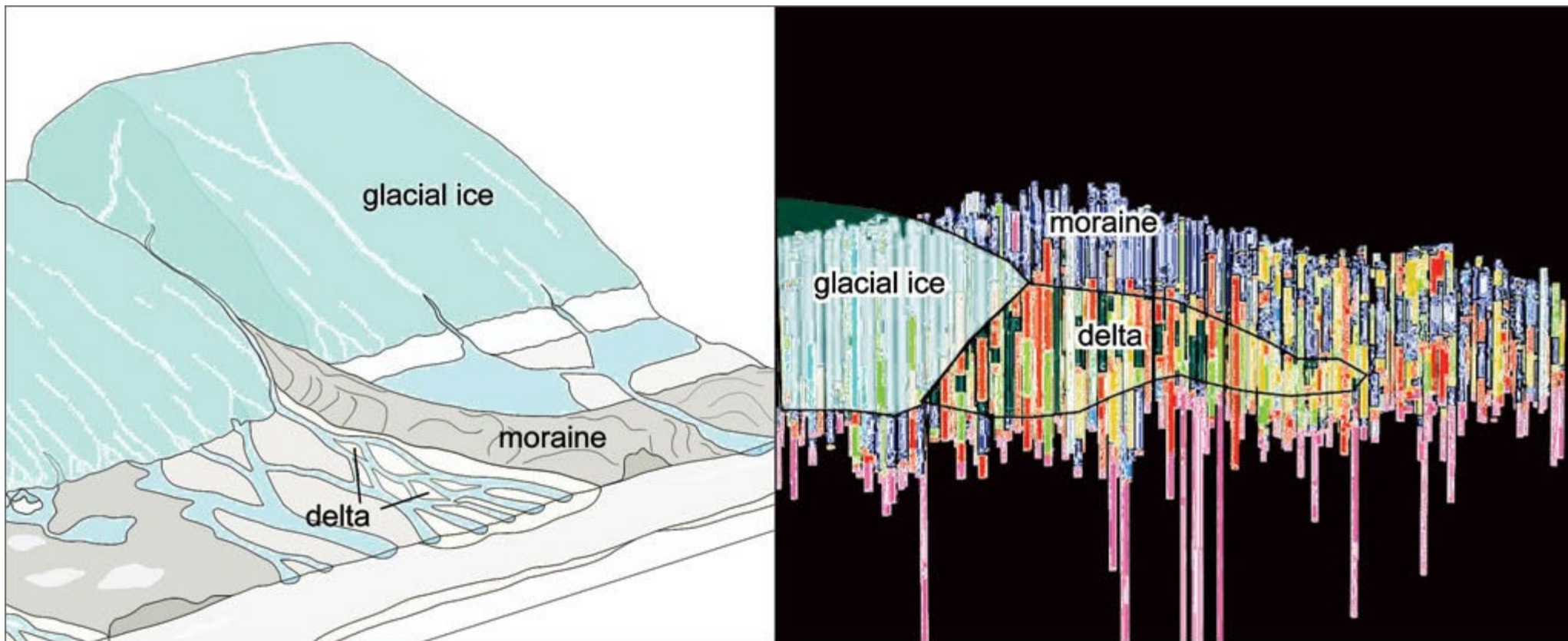
Key to borehole sediments

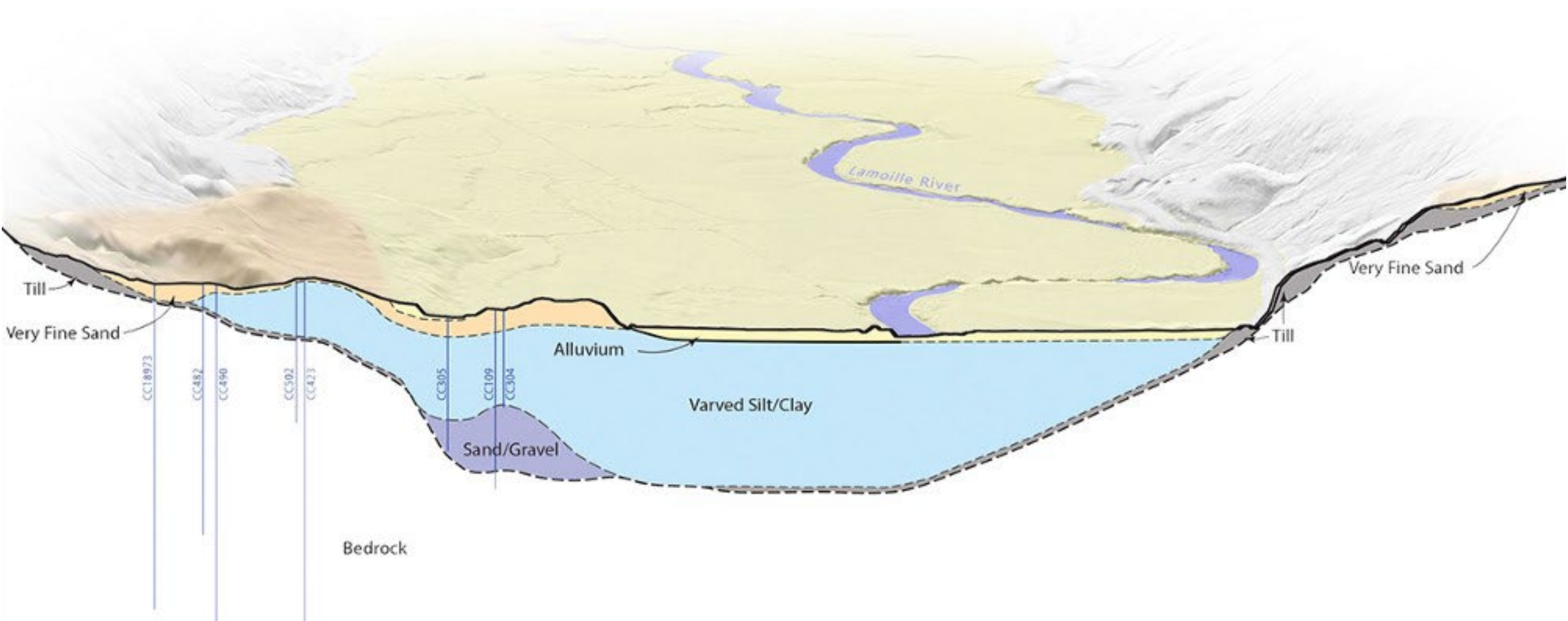


Jennifer Carrell

Illinois State Geological Survey

<https://www.esri.com/news/arcuser/0312/modeling-the-terrain-below.html>

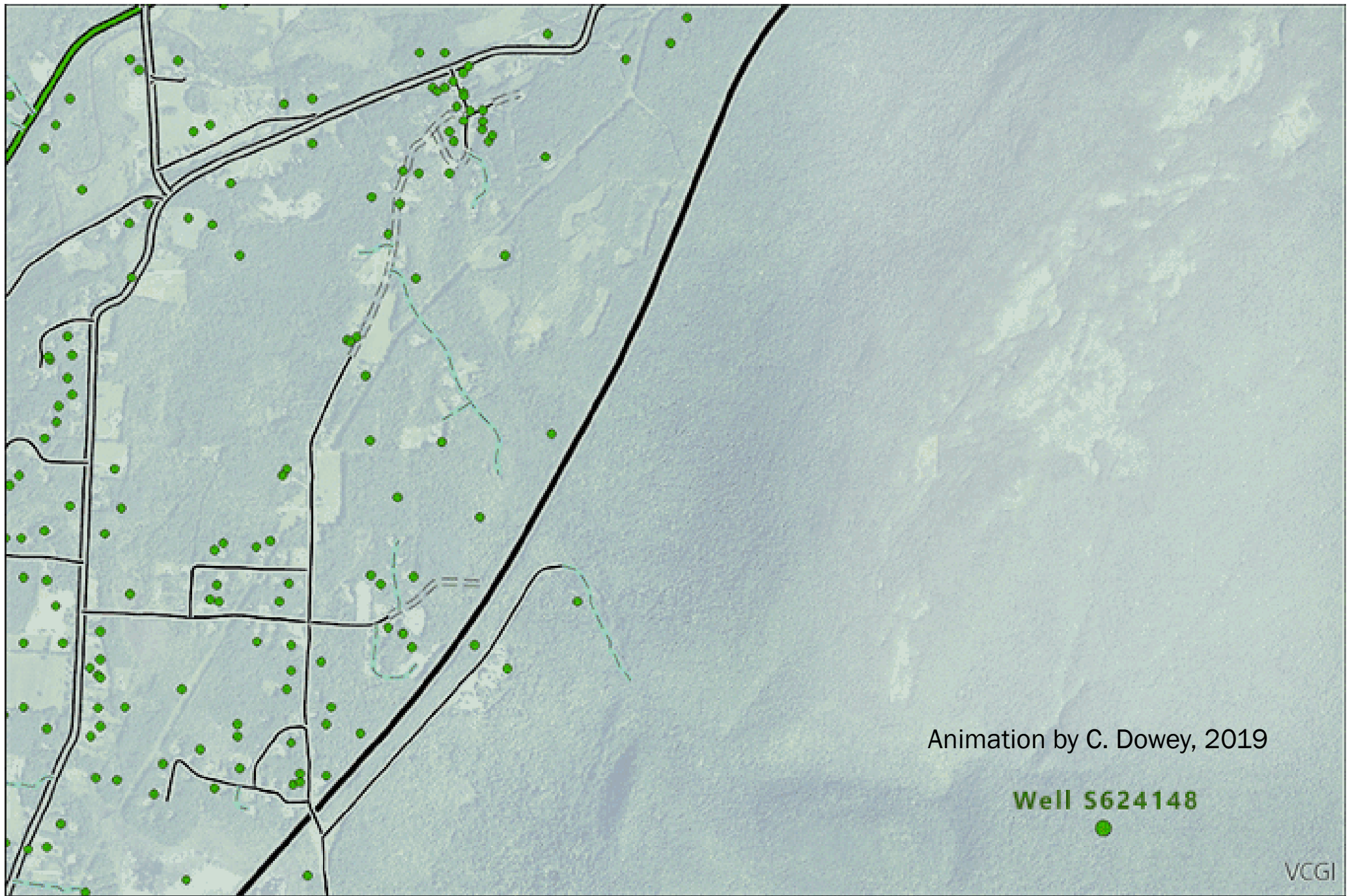




An oblique 3D-view of the Lamoille River valley near Jeffersonville, Vermont. Figure and cross section by C. Dowey

Thanks!

Questions?



Animation by C. Dowey, 2019

Well S624148

VCGI