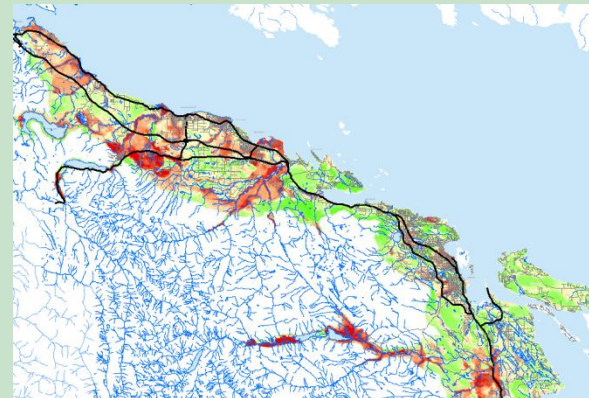


# RDN & Groundwater Vulnerability Mapping



DRINKING WATER  
WATERSHED  
PROTECTION

## Regional District of Nanaimo & Applications of the Groundwater Vulnerability Maps

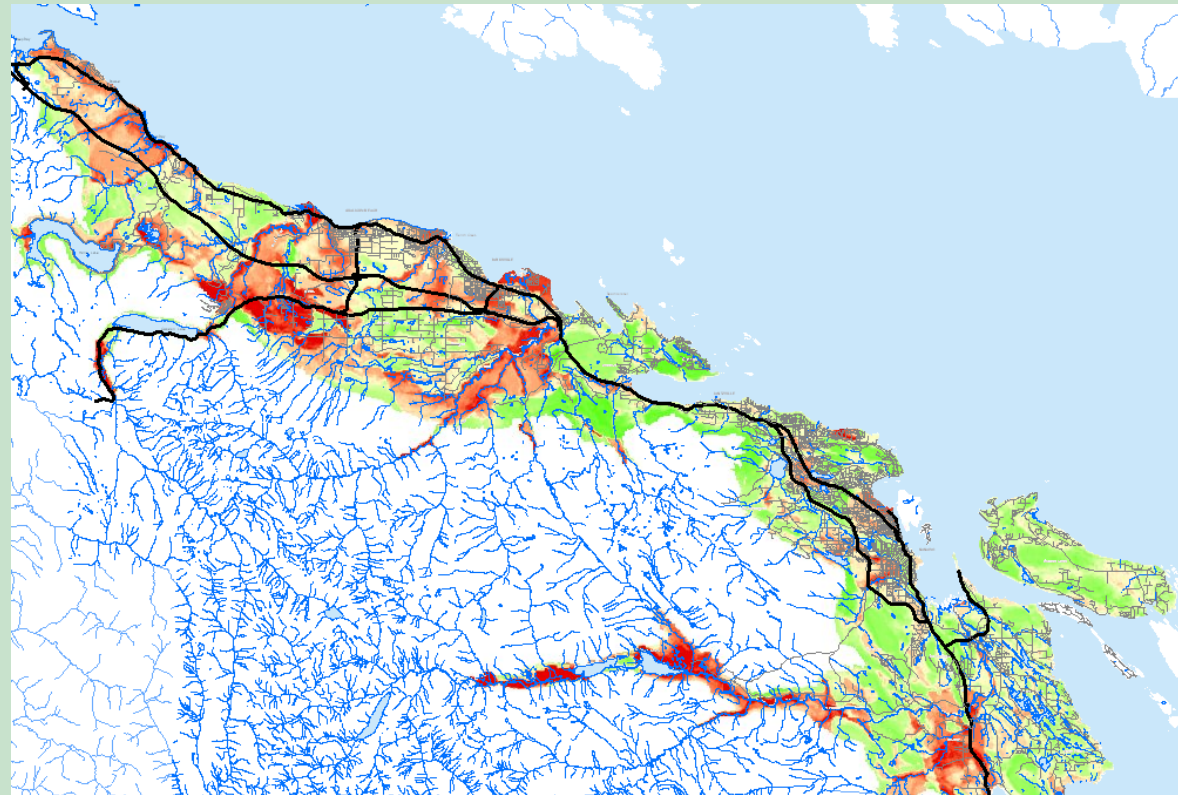


# RDN Applications of the Groundwater Vulnerability Maps

Area A Official Community Plan (OCP)  
Outreach Programs  
Water Quality Monitoring



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# OCP Application of the Groundwater Vulnerability Maps



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- Area A OCP update began ~2008
- ‘New work being done by VIU’
- Strong community interest in groundwater protection
- Groundwater primary domestic & agricultural water source
- Set budget to consider groundwater study as input to OCP
  - ‘Groundwater Assessment and Vulnerability Study’

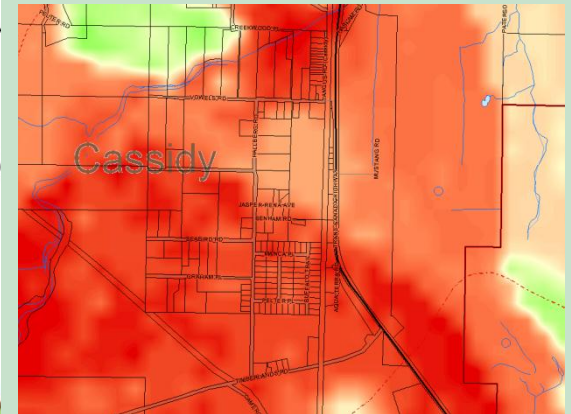
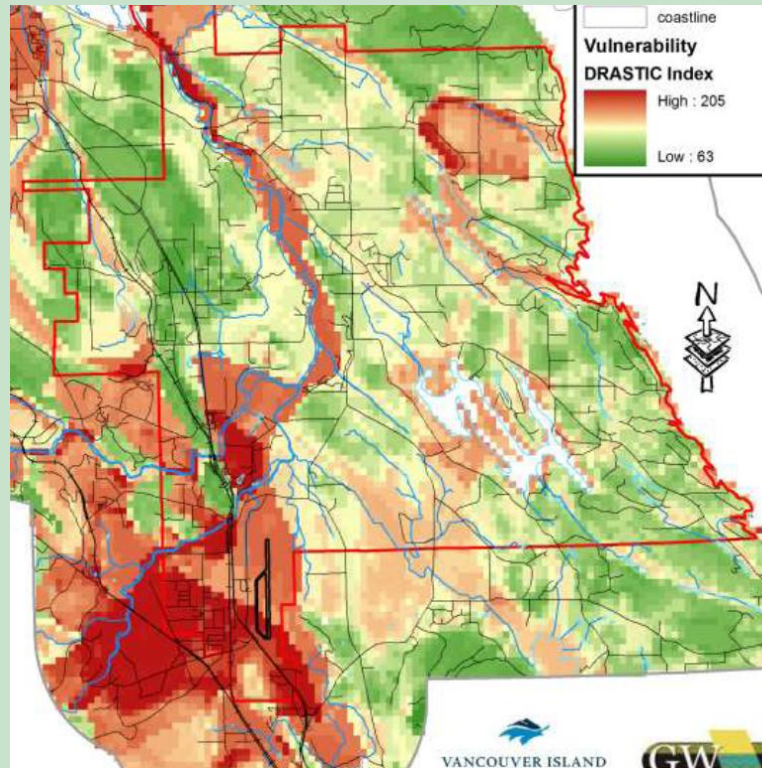
# OCP Application of the Groundwater Vulnerability Maps

## Limitations of Data:

- Not easily used at a site level
- Difficult to figure out how to apply (#'s)
- Accuracy at site scale



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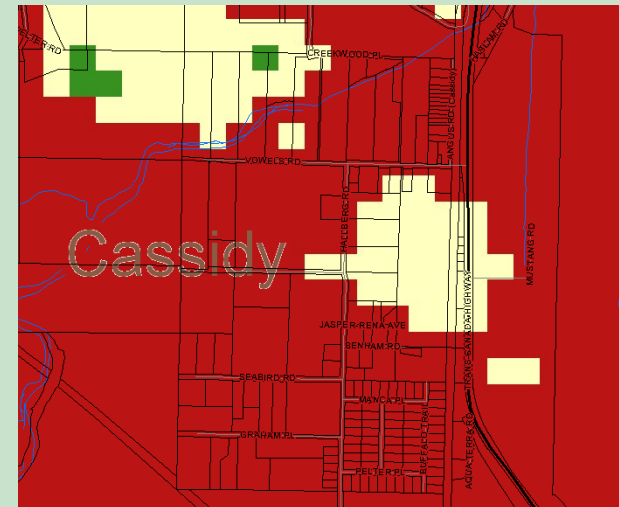
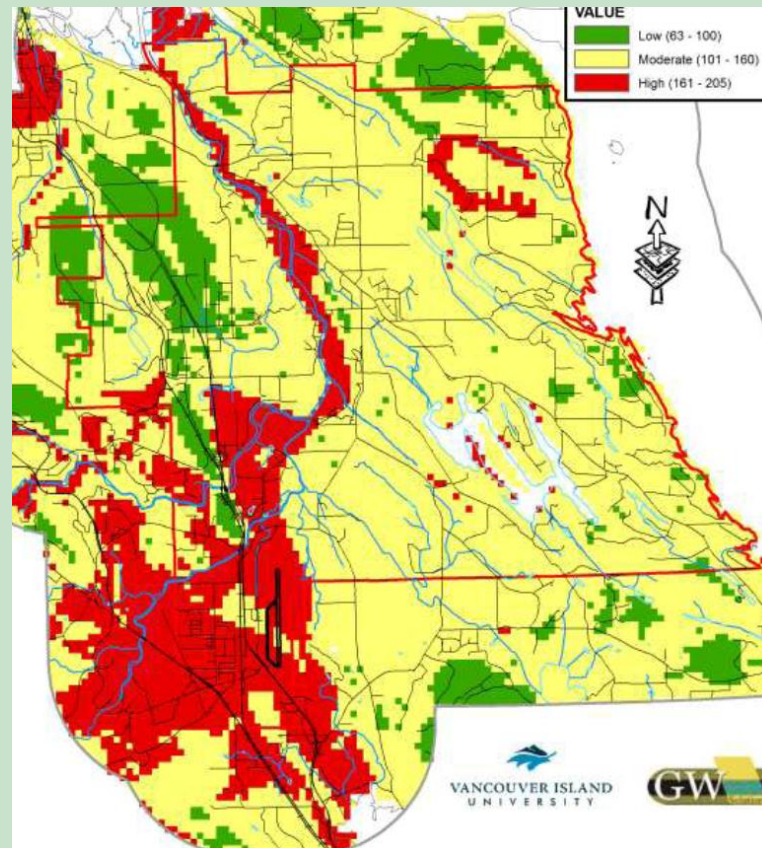
# OCP Application of the Groundwater Vulnerability Maps

## Solutions:

- Classified data (low-medium-high)



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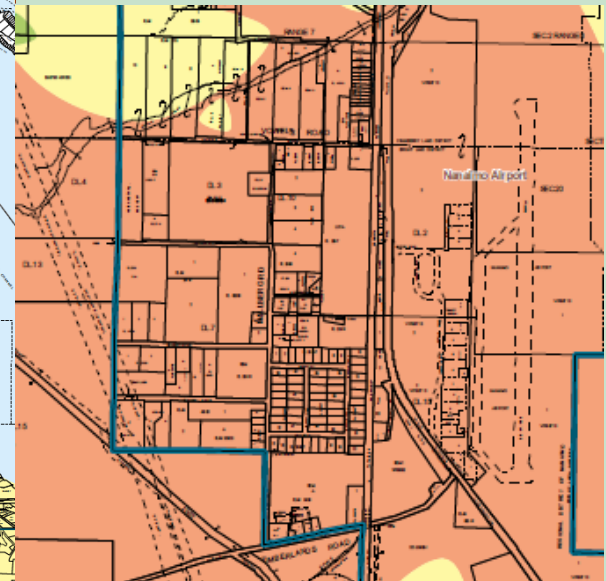
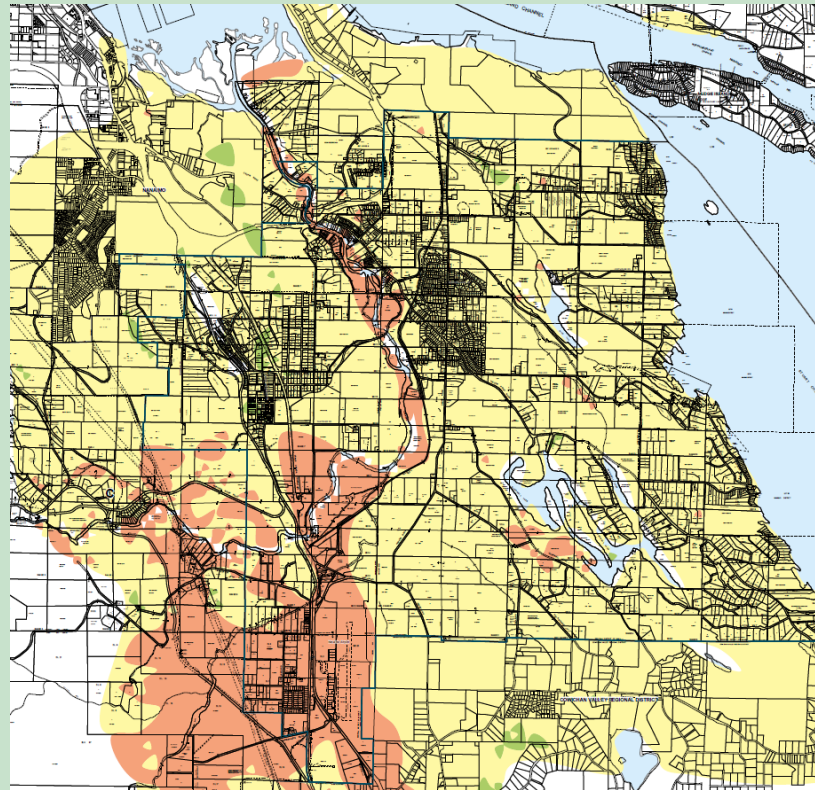
# OCP Application of the Groundwater Vulnerability Maps

## Solutions:

- ‘Smoothed’ lines



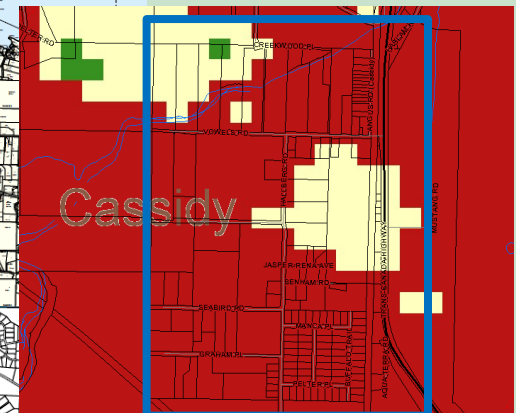
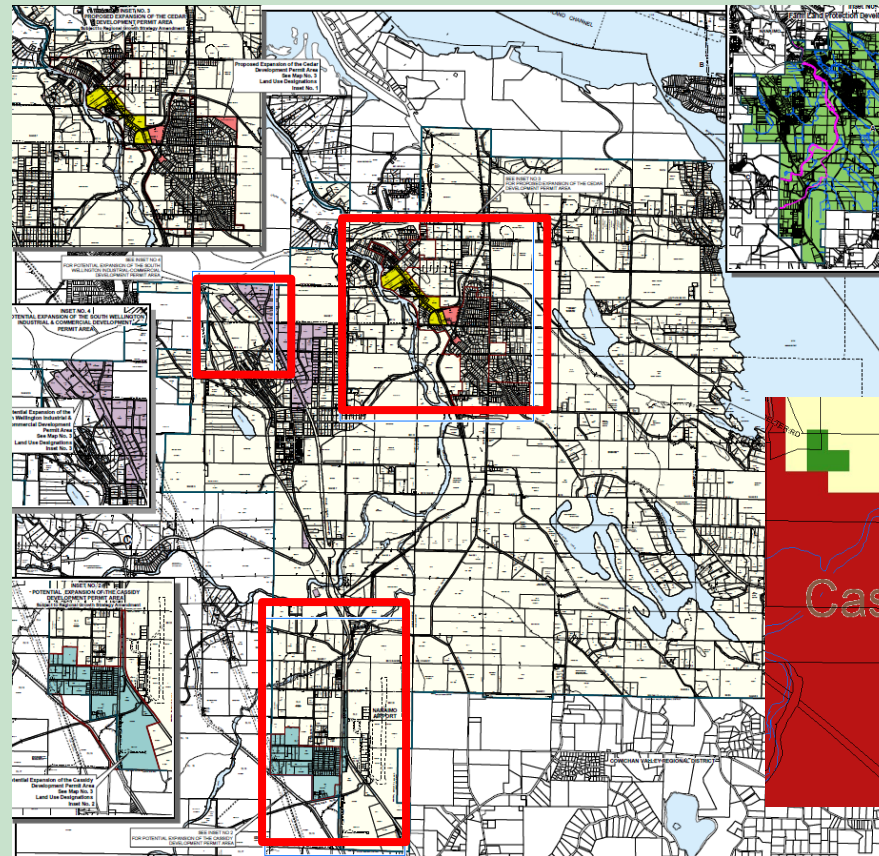
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# OCP Application of the Groundwater Vulnerability Maps

## Solutions:

- Did not use on a site level - Used with an existing DPA (Form and Character)



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# OCP Application of the Groundwater Vulnerability Maps



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## South Wellington Industrial-Commercial DPA Groundwater Protection

1. Use and disposal of substances or contaminants
2. Assessment of aquifer impacts (supply)
3. Require implementation of report's recommendations
4. RWMP to protect groundwater quality
5. Drainage directed to oil, water and grease separator with maintenance agreement
6. Proposed developments that may reasonably pose a detrimental impact on either the quality or quantity of groundwater shall not be supported.
7. Waste Management



# OCP Application of the Groundwater Vulnerability Maps



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## Cedar Main St and Cassidy DPA

### Groundwater Protection

Others plus:

1. Encourage permeable paving
2. Maintain natural hydrologic regime (ie., retain vegetation)

# OCP Application of the Groundwater Vulnerability Maps



## Policies and Objectives

### 4.4 Drinking Water Protection and Groundwater Resources

#### Policies:

1. Support the installation of monitoring wells
2. Further study including aquifer characterization and water budget
3. In unserviced areas, zoning amendments proposing increased density above 'moderate' or 'high' vulnerability require assessment
4. Land uses which could negatively impact quality, or quantity of ground or surface water shall not be supported.
5. Groundwater protection BMPs
6. Minimize impervious surfaces while protecting groundwater quality
7. Subdivision Servicing Bylaw

#### Advocacy Policies

1. Encourage the MOE to license groundwater and require reporting of extraction for all license holders
2. Support the creation and implementation of an aquifer/groundwater monitoring program
3. Encourage the subdivision approving officer, to require an aquifer impact assessment to ensure no quality or quantity impacts.

# OCP Application of the Groundwater Vulnerability Maps

## Best Management Practices



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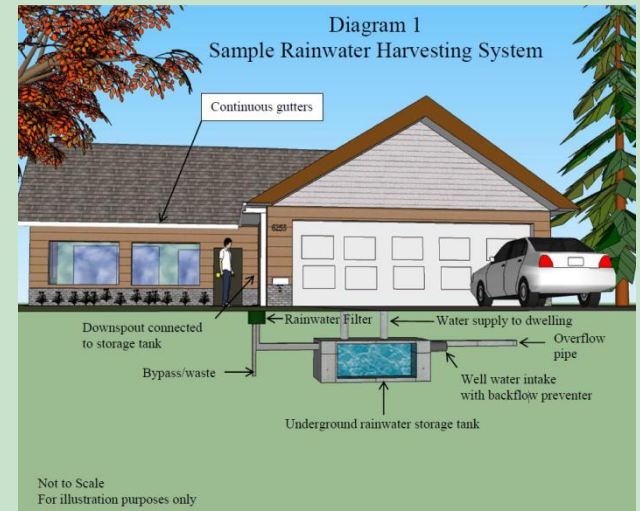
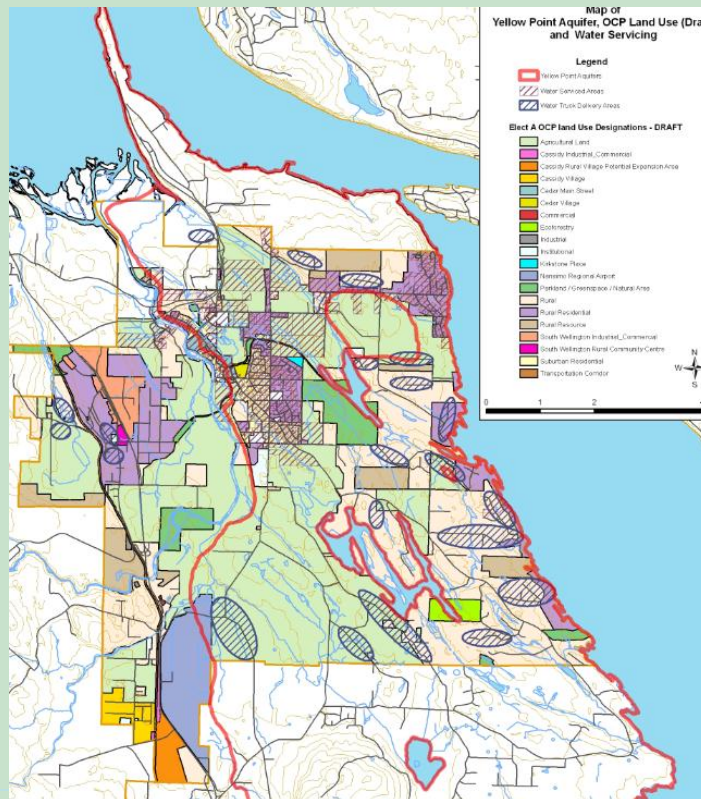
Sources of Contamination		Aquifer Vulnerability			Responsible Parties		
		Low	Moderate	High	Senior Governments	RDN & Municipalities	Individuals & Businesses
Industrial	<i>Liquid wastes</i>	Confined industrial wastewater disposal allowed (use of impermeable liners)	Confined industrial wastewater disposal allowed (use of impermeable liners)	No industrial wastewater disposal is allowed	✓		✓
	<i>Tank and pipeline leakage</i>	Tanks and pipelines are allowed, with groundwater monitoring	Tanks and pipelines are allowed, with groundwater monitoring	No tanks or pipelines are allowed	✓		✓
	<i>Mining activities</i>	Mining activities are allowed with water management plans	Mining activities are allowed with water management plans	No mining activities	✓		✓
	<i>Hazardous products handling and storing</i>	<p>Detailed list of hazardous products handled, stored and used.</p> <p>Use of highest industry standards for handling and storage (double/triple lining of containers, safe storage program, emergency plans)</p> <p>Auto – wreck yards: All vehicles coming to the yards have to be drained of all their fluids (fuels, oils – lubricating and hydraulic, cooling) and batteries are removed and recycled. The BC Vehicle Dismantling and Recycling Industry Environmental Planning Regulation (June 2007) applies.</p> <p>Design and implementation of staff education and training programs on toxicity and risks to the environment.</p>	<p>Detailed list of hazardous products handled, stored and used.</p> <p>Use of highest industry standards for handling and storage (double/triple lining of containers, safe storage program, emergency plans)</p> <p>Auto – wreck yards: All vehicles coming to the yards have to be drained of all their fluids (fuels, oils – lubricating and hydraulic, cooling) and batteries are removed and recycled. The BC Vehicle Dismantling and Recycling Industry Environmental Planning Regulation (June 2007) applies.</p> <p>Design and implementation of staff education and training programs on toxicity and risks to the environment.</p>	<p>Industrial activities in a high vulnerability zone are not recommended.</p> <p>Detailed list of type and quantity of hazardous products handled, stored and used.</p> <p>Use of highest industry standards for handling and storage (double/triple lining of containers, safe storage program, emergency plans)</p> <p>Auto – wreck yards: not allowed.</p> <p>Reporting to regulatory agencies every year.</p>	✓	✓	✓

# OCP Application of the Groundwater Vulnerability Maps

## Other Groundwater Protection Policies

### Yellow Point Aquifer Protection DPA

- To promote water conservation



# Application of the Groundwater Vulnerability Maps: Outreach Programs



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- Rural Water Quality program
  - Pilot planned for Cassidy
  - Outreach to prevent NPS and promote BMPs including proper household hazardous waste disposal, septic system maintenance, proper fueling
  - Potential industry partnerships
- Team WaterSmart outreach
- WellSmart
- Sustainable Development Checklist

# Application of the Groundwater Vulnerability Maps: Water Quality Monitoring



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- Cassidy-South Wellington Water Quality Survey
- Monitoring parameters in production wells in vulnerable areas



# RDN Applications of the Groundwater Vulnerability Maps



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## Questions?