

Showcasing Green  
Infrastructure Innovation  
on Vancouver Island  
September 26, 2008



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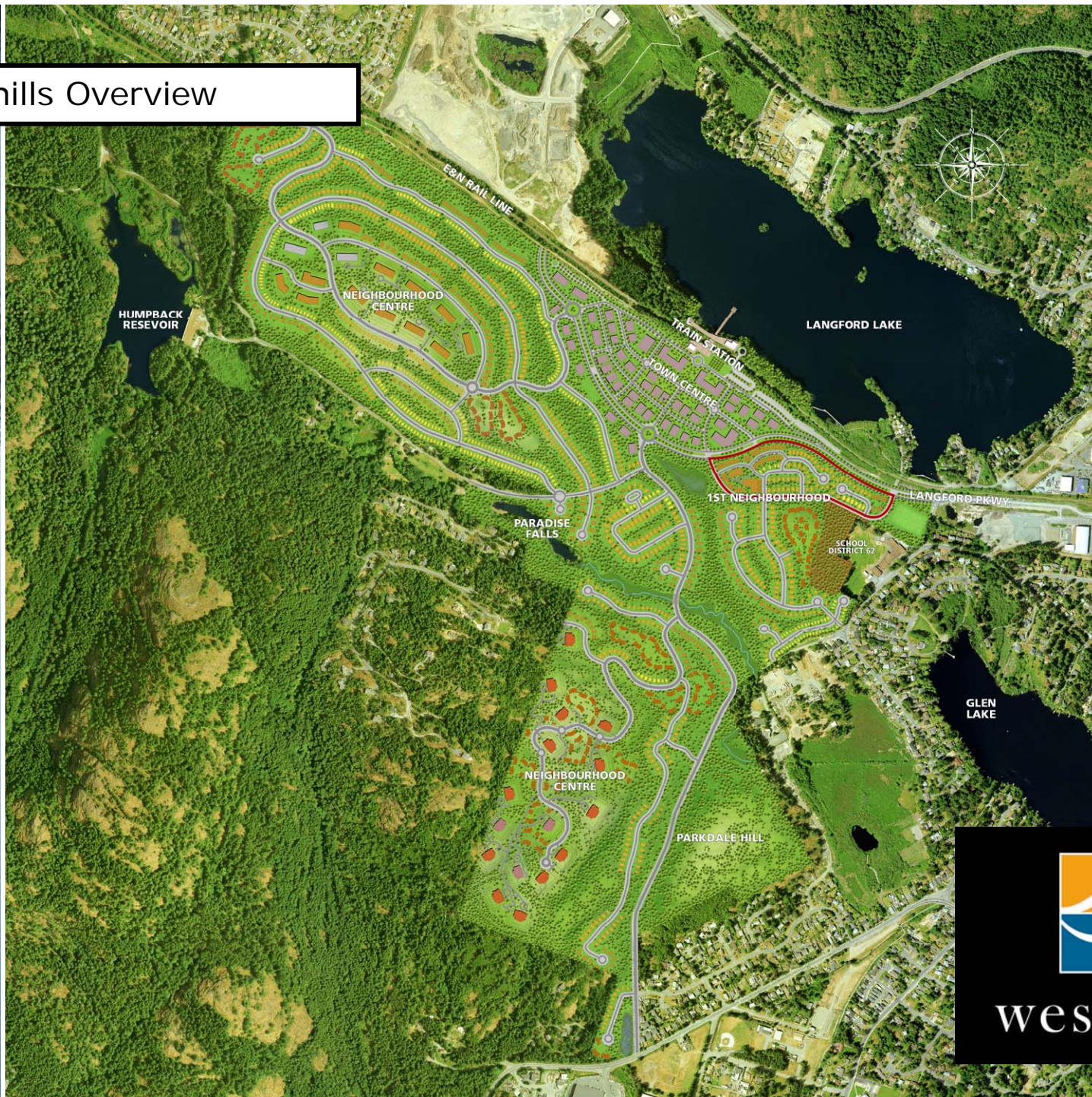
# Westhills Overview

- LEED-ND
- Built Green
- Traditional  
Neighbourhood  
Development
- Housing Innovation
- Community Building
- Infrastructure



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# Westhills Overview



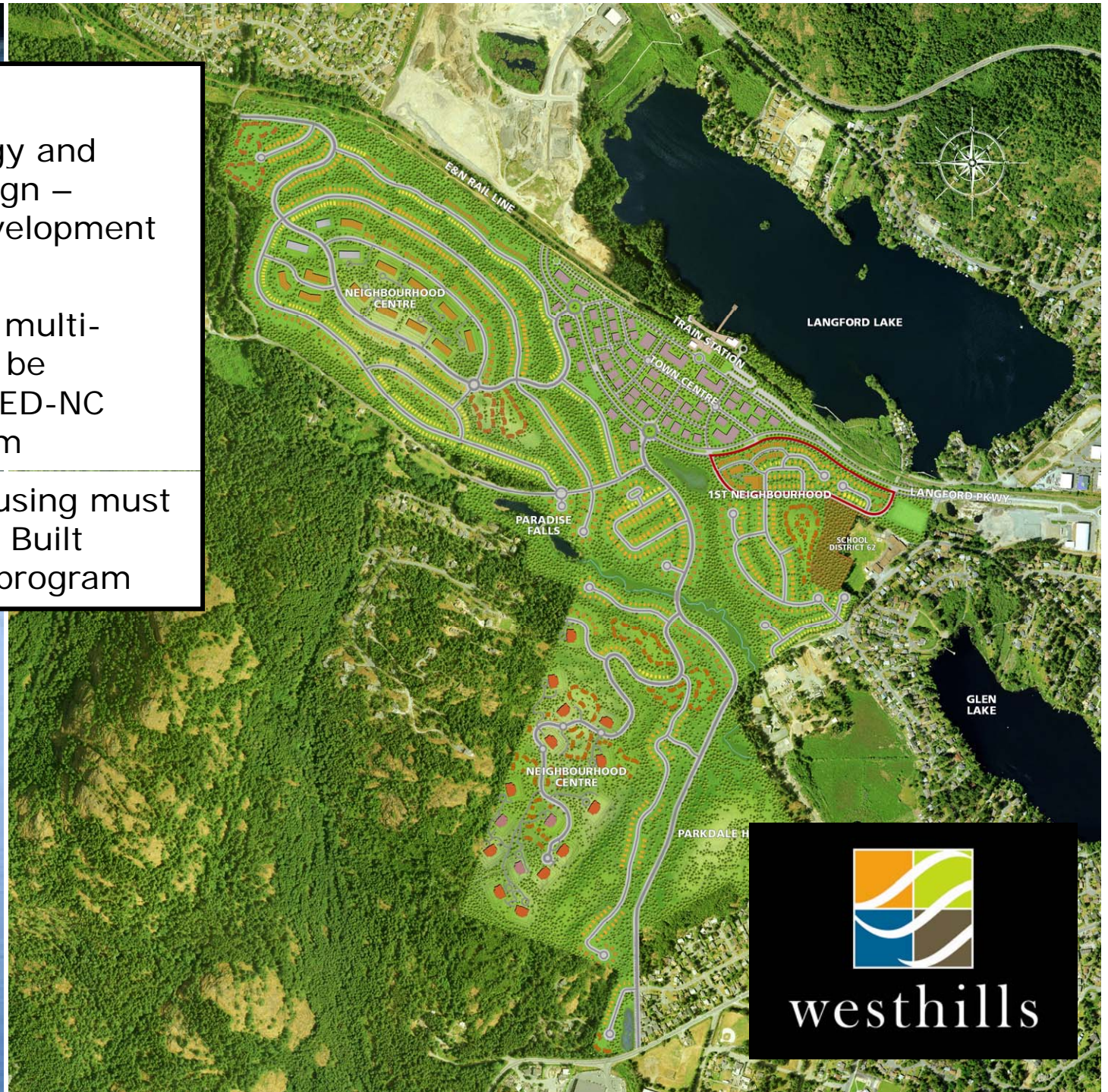
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## LEED-ND

Leadership in Energy and Environmental Design – Neighbourhood Development Pilot Program

All commercial and multi-family homes must be certifiable under LEED-NC certification program

All single family housing must be certifiable under Built Green certification program



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## LEED-ND

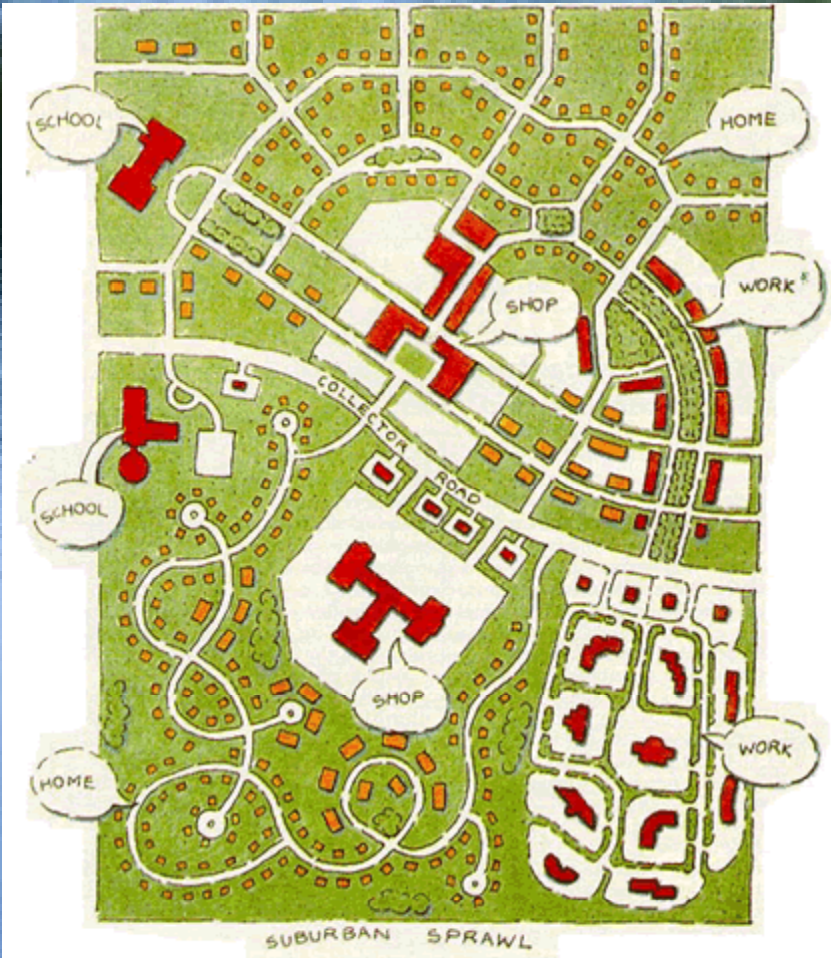
### Leadership in Energy and Environmental Design – Neighbourhood Development

- Location characteristics
- Alternative transportation strategies
- Water/energy efficiency
- Diversity of uses
- Diversity of housing
- Pedestrian orientation
- Ecological protection enhancement (species, wetlands etc)
- Community outreach
- Local food production
- Construction practices
- Waste management
- Lighting policies



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# Traditional Neighbourhood Design or Suburban Sprawl ?

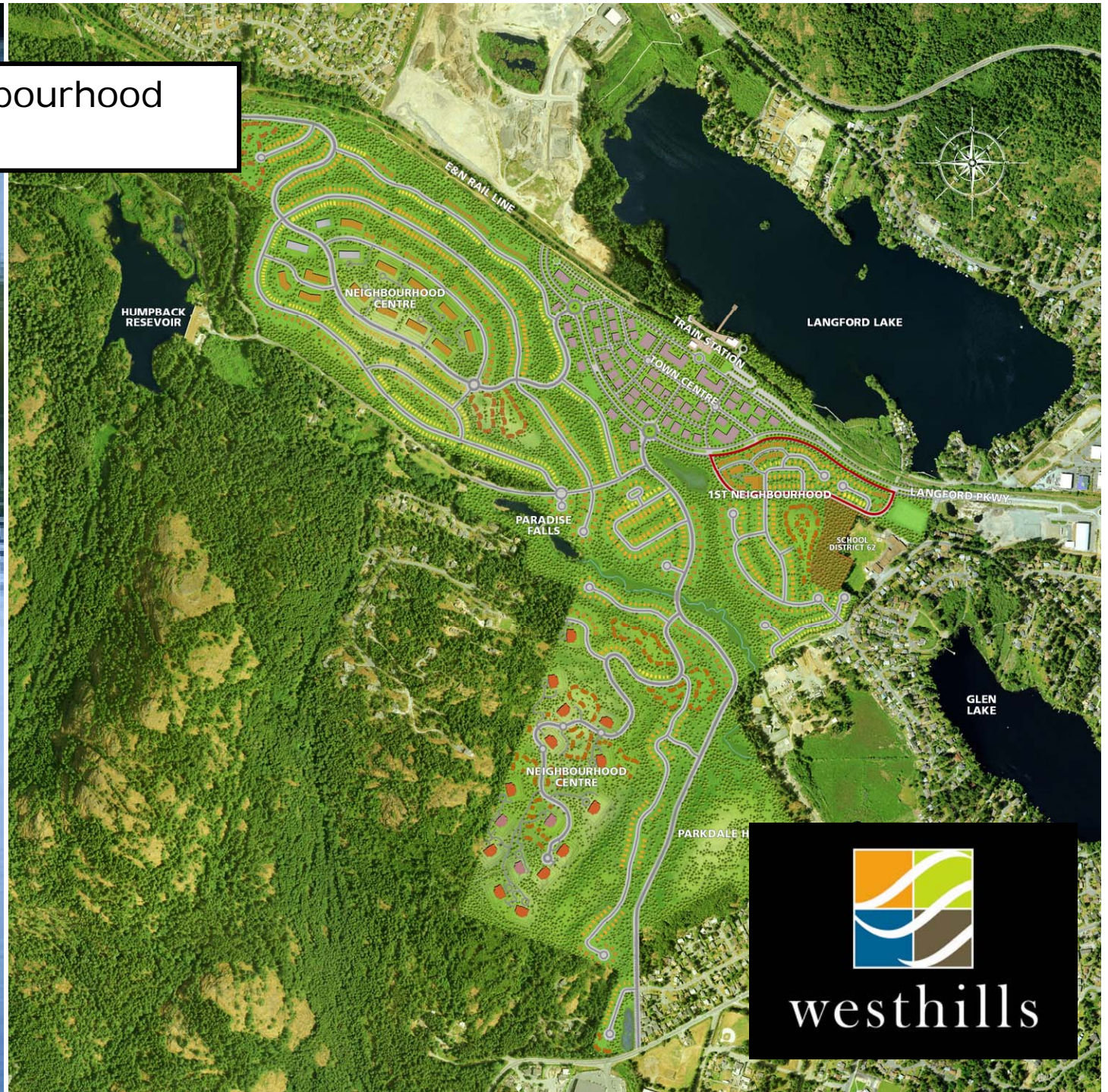


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Traditional Neighbourhood  
Design or Suburban  
Sprawl ?



# Traditional Neighbourhood Design - TND



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# TND and Community Building

- pedestrian safety, comfort and interest
- strong public realm
- designed to support "living local"
- designed to support transportation alternatives



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Town Centre  
Commercial, retail,  
office, cultural,  
educational,  
residential etc.

Rail Line

Natural and  
Built Recreation  
Amenities

Community  
Orchard

Condominiums

Townhomes

**1ST NEIGHBOURHOOD**

Community  
Gardens

Single Family  
Homes

SCHOOL  
DISTRICT 62



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Landscaping and  
Community Gardens



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Landscaping and  
Community Gardens





Housing Diversity





A deciduous tree, properly placed,  
will provide important shading  
during the summer  
and allow the winter sun  
through to warm the home.  
A low-tech  
and effective strategy.



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# Westhills DESS Goal

The principle goal of Westhills' District Energy Sharing System (DESS) is to enable Westhills and its corporate and residential customers to minimize their consumption of all forms of energy and water within Westhills and to demonstrate to our citizens, the community and the world our tangible commitment to our environmental values.



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## REDUCE

- Reduce Energy Required
- Reduce Energy Lost to the Environment
- Reduce Potable Water Needed

## REUSE

- Reuse Heat Rejected from A/C
- Reuse Cooling Rejected from Heating Buildings
- Reuse Recycled Water for Toilets Over and Over Again
- Reuse Recycled Water to Convey Energy

## RECYCLE

- Recycle all Potable Water



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# Estimated Reduction and Reuse of Energy and Water

Phase	Total Units	Energy Savings (kWh)	Estimated GHG Savings with DESS (Tonnes)			Estimated Water Savings (m3/yr)		
		Total Annual Energy Savings	Heating and Cooling and DHW			Water Recycled	Water Reused	
			BC Hydro +25% Coal*	Natural Gas	Coal Fire (Canada)		Toilet Flushing	Irrigation
1	66	572,253	135	229	486	10,184	2,037	-
2	399	2,954,530	699	1,182	2,511	57,707	13,578	-
3	503	3,856,262	912	1,543	3,278	74,789	28,536	-
4	526	4,055,683	959	1,622	3,447	78,566	44,249	-
5	615	4,827,358	1,142	1,931	4,103	93,185	62,886	-
6	721	5,746,431	1,359	2,299	4,004	110,595	85,005	-
7	928	7,036,224	1,664	2,814	5,981	139,558	112,916	-
8	1,018	7,816,569	1,849	3,127	6,644	154,340	143,784	-
9	1,251	9,205,546	2,177	3,682	7,825	186,479	181,080	-
10	1,446	10,063,043	2,380	4,025	8,554	210,623	223,205	-
11	1,603	11,424,312	2,702	4,570	9,711	234,385	270,082	-
12	1,896	13,712,268	3,243	5,485	11,655	275,721	325,226	-
13	2,095	14,806,448	3,502	5,923	12,585	302,275	385,681	-
14	2,287	15,966,184	3,776	6,386	13,571	326,967	451,074	-
15	2,637	17,245,984	4,079	6,898	14,659	367,263	524,527	-
16	3,396	19,812,143	4,686	7,925	16,840	453,741	615,275	-
17	3,836	21,455,663	5,074	8,582	18,237	504,549	716,185	-
18	4,718	23,977,294	5,671	9,591	20,381	603,044	836,794	-
19	5,309	25,882,185	6,121	10,353	22,000	669,976	970,789	-
20	5,950	28,220,600	6,674	11,288	23,988	745,531	1,119,895	-
	5,950	28,220,600	6,674	11,288	23,988	745,531	1,119,895	-
Commercial		20,000,000	11,000					

**Assumptions**

Average Unit Size Energy Savings			
SF	2,500	HVAC Savings	75%
TH	1,600	DHW Savings	50%
APT	873		

Note: The above numbers are estimates only.



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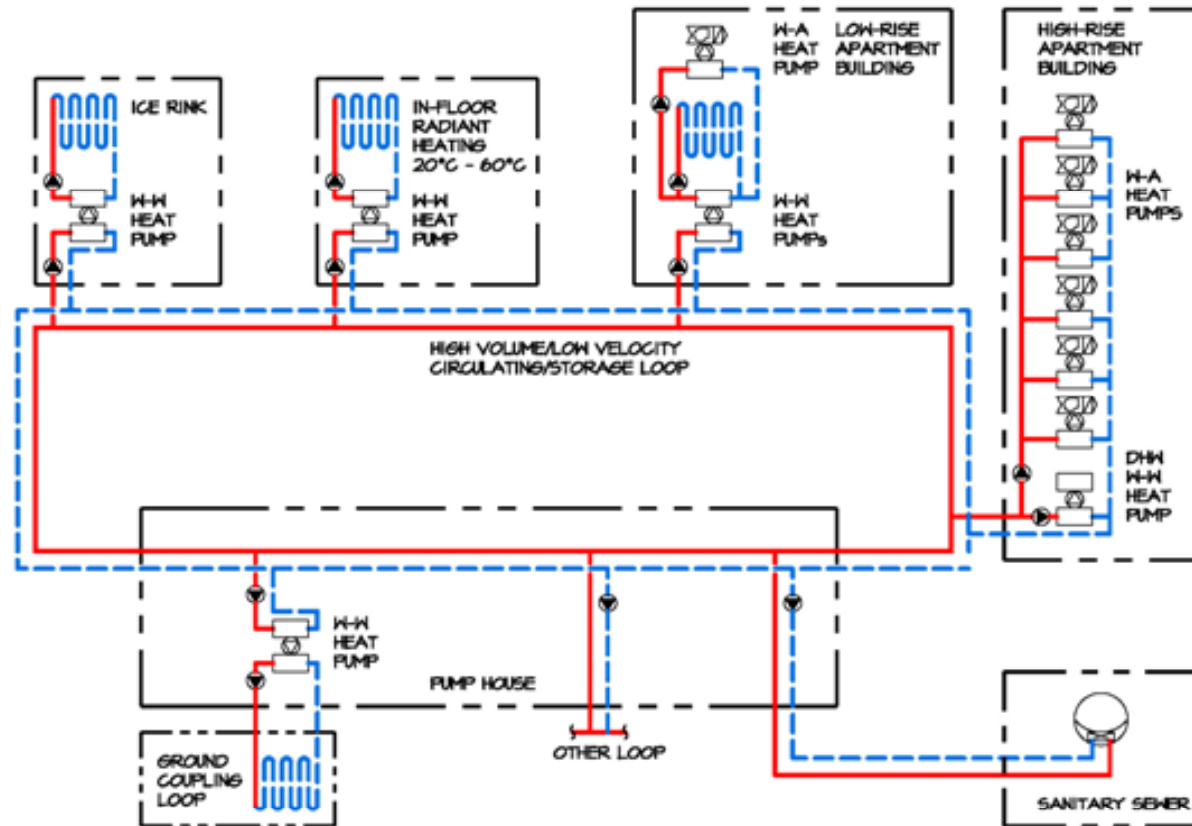
# How Does It Work

Westhills' DESS will minimize energy and water consumption by connecting buildings to a network of underground pipes which will allow the buildings to work co-operatively to minimize energy use in both heating, cooling and domestic hot water, while also providing recycled water from the waste water treatment plant (when it comes on line) for toilet flushing and irrigation water.



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# District Energy Sharing System

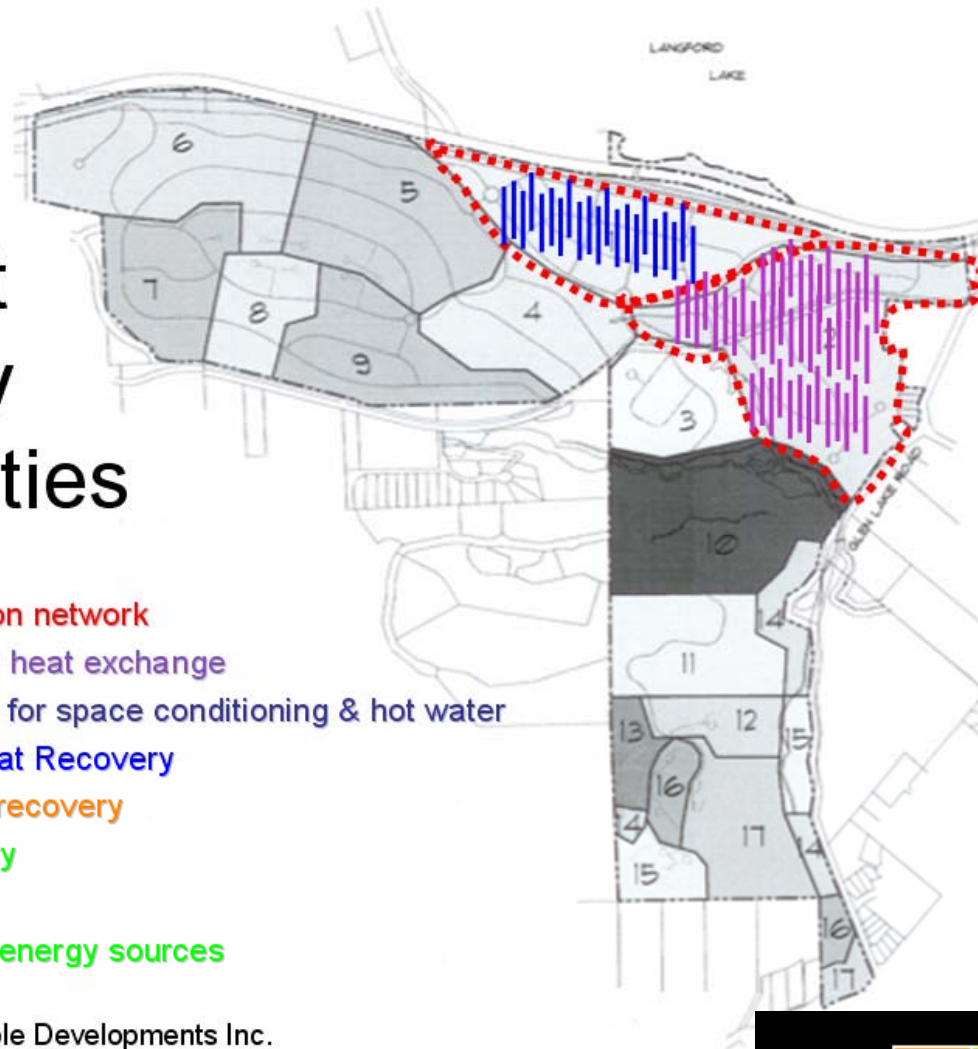


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# District Energy Opportunities

1. District energy distribution network
2. Geothermal ground loop heat exchange
3. Geothermal heat pumps for space conditioning & hot water
4. Commercial Building Heat Recovery
5. Sewage treatment heat recovery
6. Grey water heat recovery
7. Solar Thermal
8. Photovoltaics and other energy sources

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# Cost

By working at the source to share energy and recycle water, Westhills will minimize the overall demand for additional energy sources and water, which in turn will reduce the cost of the infrastructure and result in more predictable heating, cooling and domestic hot water costs to the consumer. This will make Westhills' DESS the most efficient way for residents and business owners to conserve energy and water available today.



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# Summary

## Encouraging innovation and conservation in energy and water by:

1. Sharing heating and cooling across the Westhills site minimizing the demand for additional energy sources
2. Recycling all water through a wastewater treatment plant, (when it becomes available) and reusing it for toilets and irrigation systems, minimizing the demand for potable drinking water
3. Minimizing overall energy demand Westhills will make alternative energy sources more feasible as a realistic supplement to building energy
4. Encouraging home and business owners to invest in additional sources of alternative energy (subject to Westhills Energy and Conservation Guidelines) and sell that energy back to the Westhills utility, similar to BC Hydro's Net-Metering Program.
5. Charging for energy transferred to and from the home, naturally encouraging conservation



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