Wellhead Protection Plan
The Town of Montreat
Buncombe County
PWS ID #01-11-484

Updated October 21, 2011

Plan first approved August 13, 2002

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Background

In 1986, Safe Water Drinking Act (SWDA) amendments added Section 1428, "State Programs to Establish Wellhead Protection Areas", which requires each state to develop a program to "protect wellhead areas within their jurisdiction from contaminants which may have any adverse affects on the health of persons." The term wellhead protection area is defined in the law as "the surface and subsurface area surrounding, a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield." North Carolina's EPA approved Wellhead Protection Program provides technical support to local governments and public water supply systems in their endeavors to develop and implement their own Wellhead Protection Plans.

North Carolina's objective in developing a protection plan is to provide a process for public water system operators to learn more about their groundwater systems and how to protect them. Wellhead Protection Plans allow communities to take charge of protecting the quality of their drinking water by identifying and carefully managing areas that supply groundwater to their public wells.

Regulations of the **North Carolina Division of Environmental Health (NCDEH)** require wellhead protection measures for any public water supply wells to be used as a community or non-transient, non-community water system to meet the following requirements:

(1) The well shall be located on a lot so that the area within 100 feet of the well shall be owned or controlled by the person supplying the water. The supplier of water shall be able to protect the well lot from potential sources of pollution and to construct landscape features for drainage and diversion of pollution.

(2) The minimum horizontal separation between the well and known potential sources of pollution shall be as follows:

- (a) 100 feet from any sanitary sewage disposal system, sewer, or a sewer pipe unless the sewer is constructed of water main materials and joints, in which case the sewer pipe shall be at least 50 feet from the well;
- (b) 200 feet from a subsurface sanitary sewage treatment and disposal system designed for 3000 or more gallons of wastewater a day flows, unless it is determined that the well water source utilized a confined aquifer;
- (c) 500 feet from a septage disposal site;
- (d) 100 feet from buildings, mobile homes, permanent structures, animal houses or lots, or cultivated areas to which chemicals are applied;
- (e) 100 feet from surface water;
- (f) 100 feet from a chemical or petroleum fuel underground storage tank with secondary containment;
- (g) 500 feet from a chemical or petroleum fuel underground storage tank without secondary containment;
- (h) 500 feet from the boundary of a ground water contamination area;
- (i) 500 feet from a sanitary landfill or non-permitted non-hazardous solid waste disposal site;
- (j) 1000 feet from a hazardous waste disposal site or in any location which conflicts with the North Carolina Hazardous Waste Management Rules cited as 15A NCAC 13A;

(k) 300 feet from a cemetery or burial ground; and
(l) 100 feet from any other potential source of pollution.

(3) The Department may require greater separation distances or impose other protective measures then necessary to protect the well from pollution; the Department shall consider as follows:

(a) The hazard or health risk associated with the source of pollution;
(b) The proximity of the potential source to the well;
(c) The type of material, facility or circumstance that poses the source or potential source of pollution;
(d) The volume or size of the source or potential source of pollution;
(e) Hydrogeological features of the site which could affect the movement of contaminants to the source water;
(f) The effect which well operation might have on the movement of contamination;
(g) The feasibility of providing additional separation distances or protective measures.

(4) The lot shall be graded or sloped so that surface water is diverted away from the wellhead. The lot shall not be subject to flooding.

(5) When the supplier of water is unable to locate water from any other approved source and when an existing well can no longer provide water that meets the requirement of this Subchapter, a representative of the Division may approve a smaller well lot and reduced separation distances for temporary use.

In addition to this delineation, communities are encouraged to establish wellhead protection plans, which include the following:

(1) The formation of a wellhead protection committee to establish and implement the wellhead protection program whose role it is to conduct a potential contaminant source inventory, provide options for the management of the WHP area, seek public input into the creation of the WHP plan, seek approval of the WHP program and to implement the WHP program;

(2) Development of a public education program;

(3) Delineation of the contributing areas of the water sources;

(4) Identification of potential contamination sources within the wellhead protection area;

(5) Develop and implement wellhead protection area management actions to protect the water sources;

(6) Develop an Emergency Contingency Plan for alternative water supply sources in the event the groundwater supply becomes contaminated and emergency response planning for incidents that may impact water quality;

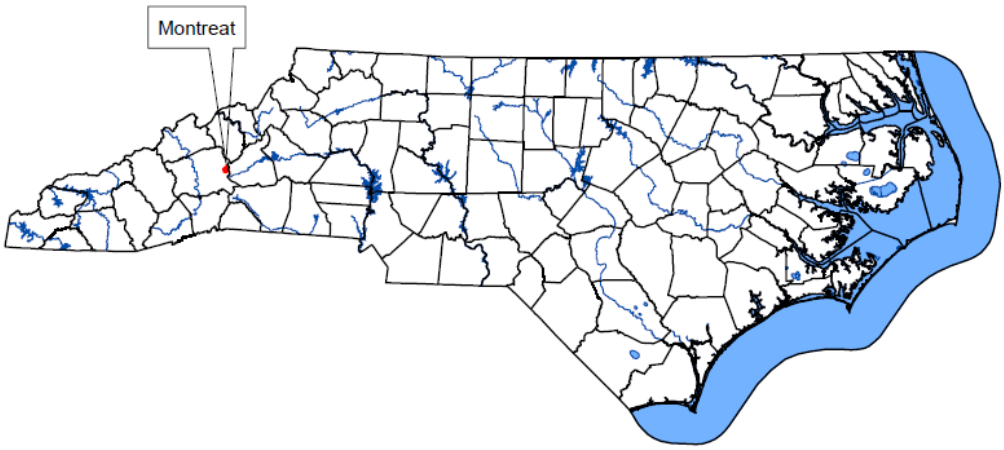
(7) Conduct new water source planning to insure the protection of new water source locations and to augment current supplies.

A copy of this plan should be forwarded to the Regional NCDENR office for their review and recommendations. NC DENR will provide the final approval for WHP Programs. Plans should be submitted to:

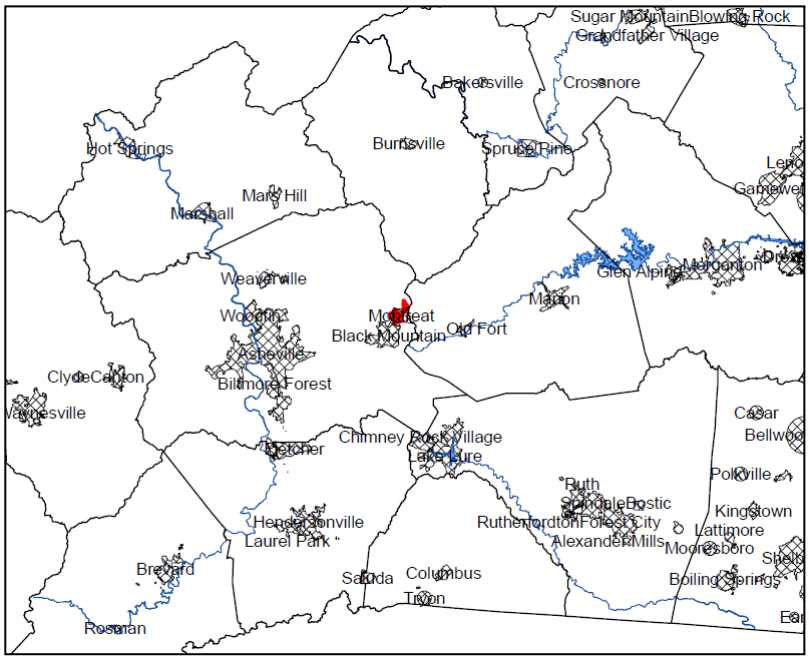
M. Gale Johnson, L.G.
Public Water Supply Section
1634 Mail Service Center
Raleigh, North Carolina 27699-1634
Phone 919-715-2853
Fax 919-715-4374

Introduction

The Town of Montreat is located in the eastern portion of Buncombe County, just north of the Town of Black Mountain, in western North Carolina. Montreat's water supply system (PWS ID # 01-11-484) serves a population of 730 people via 665 connections. The town owns twelve wells, but operates only eleven at present. Because Well #6 and Well #4 influence each other, Well # 4 has been taken off line, but has not been abandoned at this time. The wells obtain water from a bedrock aquifer and are located in the Blue Ridge and Inner Piedmont Recharge Area, where the estimated average recharge rate is 600,000 gallons per day per square mile. The wells are not screened. The town has two storage tanks with a total capacity of 600,000 gallons. The town has two certified operators and chemical addition consists of aqua mag, chlorine, and two wells, nos. 6 and 8 use poly phosphate for iron removal. Average daily usage is 85,585 gallons per day.



Montreat within North Carolina



Since this WHPP was first approved in 2002, four new wells have been drilled for the Town of Montreat to increase their water supply. These four wells are located on property upgradient from the Town and adjoins property that has now been permanently conserved by the Montreat Conference Center under a conservation easement through the Southern Appalachian Highlands Conservancy. This area consists of approximately 2,500 acres that is bordered to the north by the Blue Ridge Parkway and to the west by the City of Asheville's North Fork reservoir property, all of which will remain undeveloped with the only activity being allowed on the property being passive recreational uses.

The Town of Montreat's population is seasonal in nature. In the winter the population is about 730 people, but that number swells to 800-1,600 people per week who attend retreats and camps. The Town is also home to Montreat College which has a student population of about 450 students.

Table 1. Additional Well Information

Well #	Location	Depth (ft)	Depth cased (ft)
A	Texas Road	500	90
B	Texas Road	750	85
1	Calvin Trail	400	40
2	Assembly Drive	345	23
3	Assembly Drive	345	37
4 (offline)		345	36
5	Assembly Drive	305	51
6	Rainbow Terrace	545	36
Harmony A01	Harmony Lane	605	95
A02	Greybeard Trail (closest to creek)	605	95
A03	Greybeard Trail (Left looking up valley)	605	75
A04	Greybeard Trail (middle well site)	605	93

The Wellhead Protection Committee (WPC)

The following people have been designated as the Town of Montreat's Wellhead Protection Committee (WPC):

Name	Position
Mr. Ronald Nalley	Town Administrator
Mrs. Letta Jean Taylor	Mayor
Dr. Ruth Currie	Commissioner of Public Works
Mr. Steve Freeman	Public Works Director
Mr. Barry Creasman	Senior Operator
Mrs. Misty R. Gedlinske	Town Clerk

Ms. Debbie Maner, Sourcewater Specialist with the North Carolina Rural Water Association provided technical assistance throughout the process of developing the Plan. The positions responsible for implementing the Plan are the Montreat Town Council. They have accepted the recommendations made in the Plan by the WPC. The Town of Montreat will begin implementation of the Plan immediately following its approval by the Public Water Supply Section of NCDENR and will complete implementation within ninety (90) days. Public Works Director, Steve Freeman has been granted authority for implementing the Plan.

Upon completion of the implementation phase of the WHP Plan, the individual responsible for implementation will submit notification to the Public Water Supply Section in accordance with the schedule set forth in the approved WHP plan.

Delineation of the Wellhead Protection Areas

The Town of Montreat is located in the Blue Ridge physiographic province in an area in which recharge reaching the water table is estimated to be about 600,000 gpd/mi^2 [Pubic Water Supply Section (PWSS)]. The Town is situated along the Flat Creek in a valley surrounded by mountain ridges. The ridges on the west, north and eastern sides of the town range in elevation from 3000 to 4000 feet. The Town's eight wells are located very close to and on both sides of the stream, which runs from northeast to southwest.

The North Carolina Wellhead Protection Guidelines recommend that the Town of Montreat use the Calculated Fixed Radius (CFR) Method to delineate their wellhead protection areas (WHPAs). The CFR method is a simplified method that produces a circular WHPA centered on well or wellfield. It is applicable to all wells withdrawing from surficial, unconfined aquifers in the Coastal Plain and for all wells in the Piedmont and Mountain regions. The CFR method is believed to provide a reasonable estimate of the area in need of protection. Other more sophisticated delineation methods may be used to more accurately define the WHPA if time and resources are available.

The CFR method involves estimating the size of the contributing area to the well or wellfield. The contributing area is the land area which supplies the water being pumped from a well. The size of the contributing area is controlled by the rate at which water is pumped from the well and the rate at which the aquifer is replenished by recharge. For a given recharge rate, the larger the well pumping rate, the larger the contributing area must be in order to supply the water being withdrawn.

For an unconfined aquifer, the contributing area surrounds, but is not necessarily centered on, the pumping well. The area is of sufficient size such that the rate of withdrawal from the pumping well is balanced by the rate of recharge to the aquifer. Within this area, any water that percolates across the unsaturated zone and recharges the underlying ground water will eventually flow to and discharge from the well. This is the area of primary concern for wellhead protection because it is within this area that any contaminant released to the environment that reaches the ground water can reasonably be expected to move toward and possibly reach the well or wellfield.

The size of the contributing area for a well may be approximated by dividing the well pumping rate by the areal recharge rate to the aquifer from which the withdrawals are made. If the pumping rate is given in gallons per day and the recharge rate is in gallons per day per square mile, the division will yield the size of the contributing area in square miles.

The average daily pumping rate is often used in calculating the size of the contributing area. However, the average daily pumping rate can vary over time depending on water demand. As more water users are connected to a well, the average daily pumping rate will increase, increasing the size of the contributing area, up to the maximum capacity of the pump. A higher capacity pump can be substituted to satisfy demand up to the point where the well yield is reached. Here, the term "well yield" is used in to mean the maximum sustained pumping rate possible for a well. From a policy standpoint, changes in the size of the contributing area and the associated WHPA poses some significant problems. Because a fixed WHPA is needed within which management options may be exercised, North Carolina's WHP Program uses the well yield in the calculation of the size of the contributing area to estimate the maximum WHPA for a well.

State regulations require that all public water-supply wells have a 24-hour drawdown tests to determine their well yield. State regulations also require that the yield of the well provide the average daily demand in 12 hours. Therefore, the well yield (in gallons per minute) determined from the drawdown test is multiplied by 720 (the number of minutes in 12 hours) to define the "maximum permitted withdrawal" in gallons per day, or:

$$Q_{MPW} = \frac{Q_{MAX}}{720}$$ ***(Maximum Permitted Withdrawal)***

where: Q_{MPW} = maximum permitted withdrawal in gallons per day,

Q_{MAX} = well yield in gallons per minute, and

720 = a factor for converting the pumping rate from gallons per minute to gallons per day based on a 12 hour pumping day.

If well yield information is unavailable, the WHP Program substitutes the maximum capacity of the pump if available or the maximum pumping rate (in gallons per minute) determined from well operation records for the well yield in the calculation of the maximum permitted withdrawal. Additionally, if the actual pumping period exceeds 720 minutes per day, then the actual pumping period is used in the calculation.

Once the maximum permitted withdrawal has been determined, the approximation for the size of the contributing area becomes:

$$A_C = \frac{Q_{MPW}}{W}$$ ***(Size of the Contributing Area)***

where: A_C = contributing area in square miles,

Q_{MPW} = maximum permitted withdrawal in gallons per day, and

W = estimated average recharge rate in gallons per day per square mile.

Values of the estimated average recharge rate to the surficial aquifer range from 150,000 to 600,000 gallons per day per square mile. Values for specific areas of the state may be obtained from published information available from the North Carolina Public Water Supply Section.

Because of the complex nature of ground water flow and contaminant transport, it is not possible to define exact contributing area boundaries around each well. Two factors that affect the shape of the contributing area and its position and orientation with respect to a pumping well are the hydraulic gradient and aquifer transmissivity. In areas where the aquifer transmissivity is essentially the same in all directions, as in much of the Coastal Plain, the shape of the contributing area depends primarily on the hydraulic gradient. Where the water table is nearly flat, the contributing area is approximately circular and centered on the pumping well. In this situation, the WHPA is taken to be the same as the contributing area for the well. That is, the area of the circular WHPA centered on the pumping well is equal to the contributing area (i.e., $WHPA = A_C = Q_{MPW}/W$) and the radius is :

$$R_{WHPA} = 2980\sqrt{\frac{Q_{MPW}}{W}}$$ ***(Radius of the WHPA - low hydraulic gradients)***

where: R_{WHPA} = the radius of the WHPA in feet,

Q_{MPW} = maximum permitted withdrawal in gallons per day,

W = estimated average recharge rate in gallons per day per square mile, and

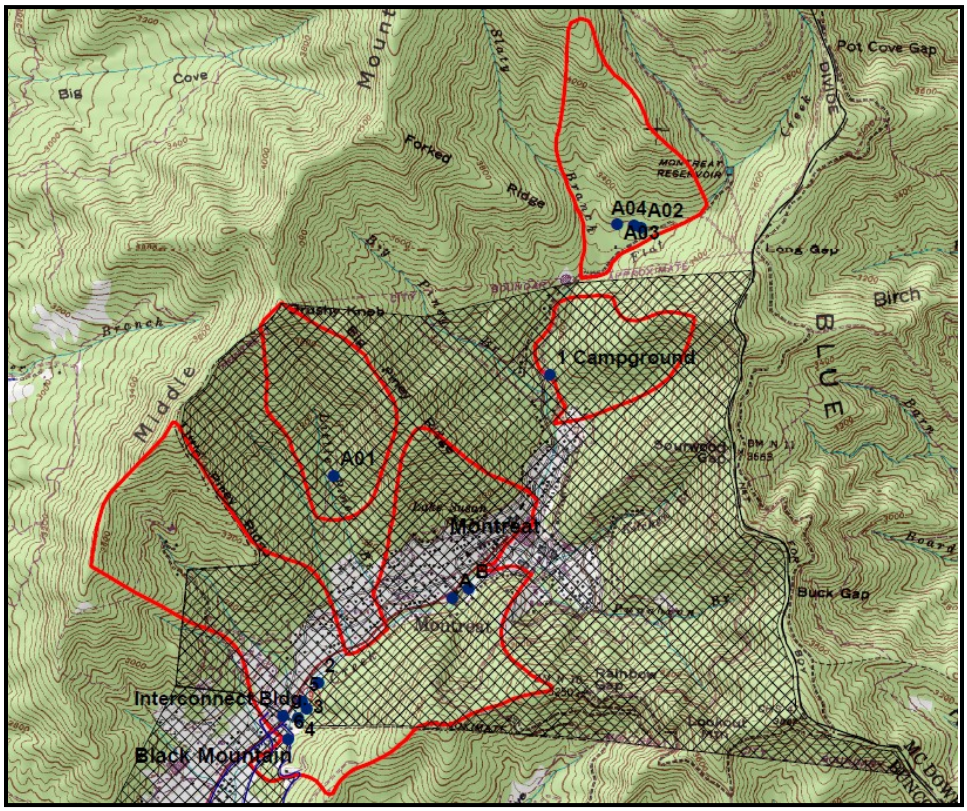
2980 = a rounded factor for converting area in square miles to radius in feet.

Information provided in Table 2 below was used to determine the areas for each of the Town of Montreat's Wellhead Protection Areas. Because of the well's locations related to hydraulic boundaries, such as ridgelines and streams, the resulting WHPAs are irregularly shaped to take into consideration the drainage area and water flow directions characteristic of their Montreat's unique watershed. A NCGS on the following page shows the Town of Montreat's WHPAs. Additional maps are included in the PCS Inventory Section.

Table 2.

Well #	Maximum Pumping Rate *(gpm)	Minutes pumped per day	Gal/Day (gpm x 720)	Recharge Rate gal/day/mi^2	WHPA Area mi^2	WHPA Area ft^2	WHPA Radius (ft)
1	60	720	43200	600,000	0.144	4014490	1131
2	60	720	43200	600,000	0.144	4014490	1131
3	38	720	27360	600,000	0.091	2542510	900
5	48	720	34560	600,000	0.115	3211592	1011
6	60	673	40380	600,000	0.135	3752433	1093
A	149	720	107280	600,000	0.358	9969316	1782
B	80	720	57600	600,000	0.192	5352653	1306
A01	30	720	21600	600,000	0.072	2007245	800
A02	30	720	21600	600,000	0.072	2007245	800
A03	20	720	14400	600,000	0.048	1338163	653
A04	30	720	21600	600,000	0.072	2007245	800
A02,A03,A04	80	720	57600	600,000	0.192	5352653	1306

*Well records were not available for several of the wells and maximum pumping rates were estimated from daily operation records.



Resulting Wellhead Protection Areas

Potential Contaminant Source Inventory

Windshield Survey – Montreat Mayor, Mrs. Letta Jean Taylor and the prior Town Administrator, Mr. Pete Post surveyed the entire Wellhead Protection Area (WHPA) and identified each potential contamination source (PCS) facility or activity that might exist within the WHPA. Onsite visits were made and additional information was obtained regarding quantity and types of contaminants kept on site. For this updated version of the WHPP, NCRWA Source Water Specialists, Debbie Maner and Brian Grogan and the Town of Montreat's Public Works Director reviewed the information in the Plan approved in 2002, and acquired the information necessary to make the Plan current.

Septic Tanks – There are three residences within the WHPA that are using septic tank systems to dispose of waste. Those locations are identified on the inventory map. A municipal wastewater system provides service to the remaining residents and businesses in the area.

Abandoned Wells – There are no known locations where wells exists that are no longer being used that have no been properly abandoned.

Database Search - Several state and federal databases were searched. A list of those databases is included in the Appendix. All results of the search were negative except for the Division of Waste Management's Underground Storage Tank (UST) Section Database. There are several incidents within the WHPA where leaks have occurred from heating oil USTs. Information about each of the incidents that occur within the WHPA is provided below:

Table 3. Potential Contaminant Source Attributes
Montreat Water System
PWS ID #01-11-484 Well B (Well #8)
From SWAP Report March 2010

Common Attributes

PCS Name	PCS ID	PCS Type	PCS Risk Rating	Street Address	City	ZIP	COUNTY
MONTREAT COLLEGE	16522	Pollution Incidents	H	311 LOOKOUT ROAD	MONTREAT	28757	BUNCOMBE
MOUNTAIN RETREAT ASSOCIATION	0-004546	UST Sites	H	401 ASSEMBLY DRIVE	MONTREAT	28757	BUNCOMBE

PCS Name	PCS ID	Attribute	Value
MONTREAT COLLEGE	16522	Contaminant Type	Petroleum
MONTREAT COLLEGE	16522	Risk Site	I
MONTREAT COLLEGE	16522	Site Priority Code	UNKNOWN

New 2/16/11 - Emerson Residence – Incident #28804 (Map Code 1M, 145 Assembly Drive): An Initial Abatement Action Report was submitted to the ARO dated 6/30/10 and described the removal and disposal of a 500 gallon UST discovered 3/3/10 during a remodeling project. According to the report, the site is approximately 0.3 miles from the nearest well (Well #2), and on the opposite side of the creek. On May 11, 2010, free product in a monitoring well measured one half inch. An Aggressive Fluid Vapor Recovery (AFVR) event was conducted 6/9/10. Before the event 1.23 ft. of free product was measured in the monitoring well. After the event there was no measurable product and 2days following the event 5/8 of an inch was detected in the well. A grab sample collected adjacent to the tank pit and 10 – 14 feet below ground surface using direct push technology showed 1.8 ppb. benzene when the groundwater standard is 1 ppb. A Limited Site Assessment (LSA) was requested for the site 7/1/10 by the ARO. It was requested that the report be submitted to that office within 120 days.

Theilman Residence – Incident #19984 (Map Code 1F between Well #A and Well #2): The incident occurred in 1999 when it was reported that a 1,000-gallon underground heating oil tank was discharging into the Flat Creek. The tank was closed in place on 2/02/99 and it was estimated that 750 gallons of oil was lost from the tank. Absorbent material was used to collect oil from the creek. Samples collected from the creek and from water supply wells in March of 2001 showed that no compounds were detected. The site is being monitored semi-annually. The report also stated that no compounds had been detected in the creek for some time. **New – 2/16/11:** A sampling report submitted in July of 2003, showed that in sampling of MW-1, and upstream and downstream in Flat Creek, no compounds were detected. It recommended that sampling at the site be discontinued as no compounds have been detected in two years of sampling. The site is a State Trust Fund site.

Wilson Building – Incident # 17636 (Map Code 1H near Well #B): The incident occurred in June 1997 when a 550-gallon heating oil UST was removed. Soil contamination at the time was reported to be 13 ppm. TPH. A Notice of Violation was sent to the responsible party in July 1997 requesting a site investigation, but there was no response in the file. A letter written on 7/31/97 ranked the site a CDE site, which means that according to Senate Bill 1317, no further action is required at the site.

Montreat Conference Center – Incident # 17435 (Map Code 1I near Well #B): A 1,000 gallon heating oil tank was removed behind Kirk Allen Building in December 1997. A Soil Assessment Report was submitted requesting site closure, but free product was detected in a monitoring well in July 1998. The consultant for the site requested permission to submit a Corrective Action Plan, but that plan was not in the file in January 2002. **New - 2/16/11:** In July of 2002, groundwater sampling conducted after four Aggressive Fluid Vapor Recovery (AFVR) events showed free product in MW-1, however groundwater below the free product was sampled and no compounds were found at levels exceeding NCDNR applicable standards. A Corrective Action Plan (CAP) submitted for the site recommends that 90 tons of soil be removed and four additional sampling events of MW-1, however, there was no additional sampling information in the file.

Montreat College-Morgan Science Building – Incident #16522 (Map Code 1J near Well #B): In November of 1996, it was reported that oil was seeping into the Puncheon and Kitchen Branches. A Notice of Violation was sent to the responsible party and a Site Check and Initial Site Characterization Report was submitted for the site. Three monitoring wells had been installed and benzene was detected in two of them at around 100 ppb. Montreat's water supply Well #B was sampled at the time also, but with no compounds detected. No further action had been taken at the site. **New 3/4/08:** The site was ranked I155D, which means it is below the threshold for the ARO to require additional cleanup at a Commercial UST site. At this time they are only working with sites above I175D.

Scarborough Property – Incident #21607 and 20874 are the same incident (Map Code 1G near Well A): The incident was closed out by the Asheville Regional Office (ARO) on April 17, 2000.

Montreat College – Incident #5317 (Map Code 1K near Well #B): The incident was closed by the ARO in March of 1990.

Montreat College – Incident #3317 (Map Code 1L near Well #B): The incident was closed by the ARO in January of 1998.

List of Potential Contamination Sources

The list below shows the potential contaminant sources (PCSs) identified during the potential contaminant source inventory along with quantities and types of contaminants found at the site. Each potential contaminant site has been given a code that was used to locate it on the inventory map included with this Plan. This updated Plan has made significant changes to the Wellhead Protection Area delineations done for the previous Plan. The area is more refined and excludes a large portion of the area that was delineated in the first Plan and so eliminates many of the PCSs identified in the first Plan, however, those PCSs that have been eliminated are still included in the list below just for additional information, but are designated as Out if they are out of the new area. Those PCSs that are out are not included in the Risk Assessment. The code given each site is based on the following inventory list.

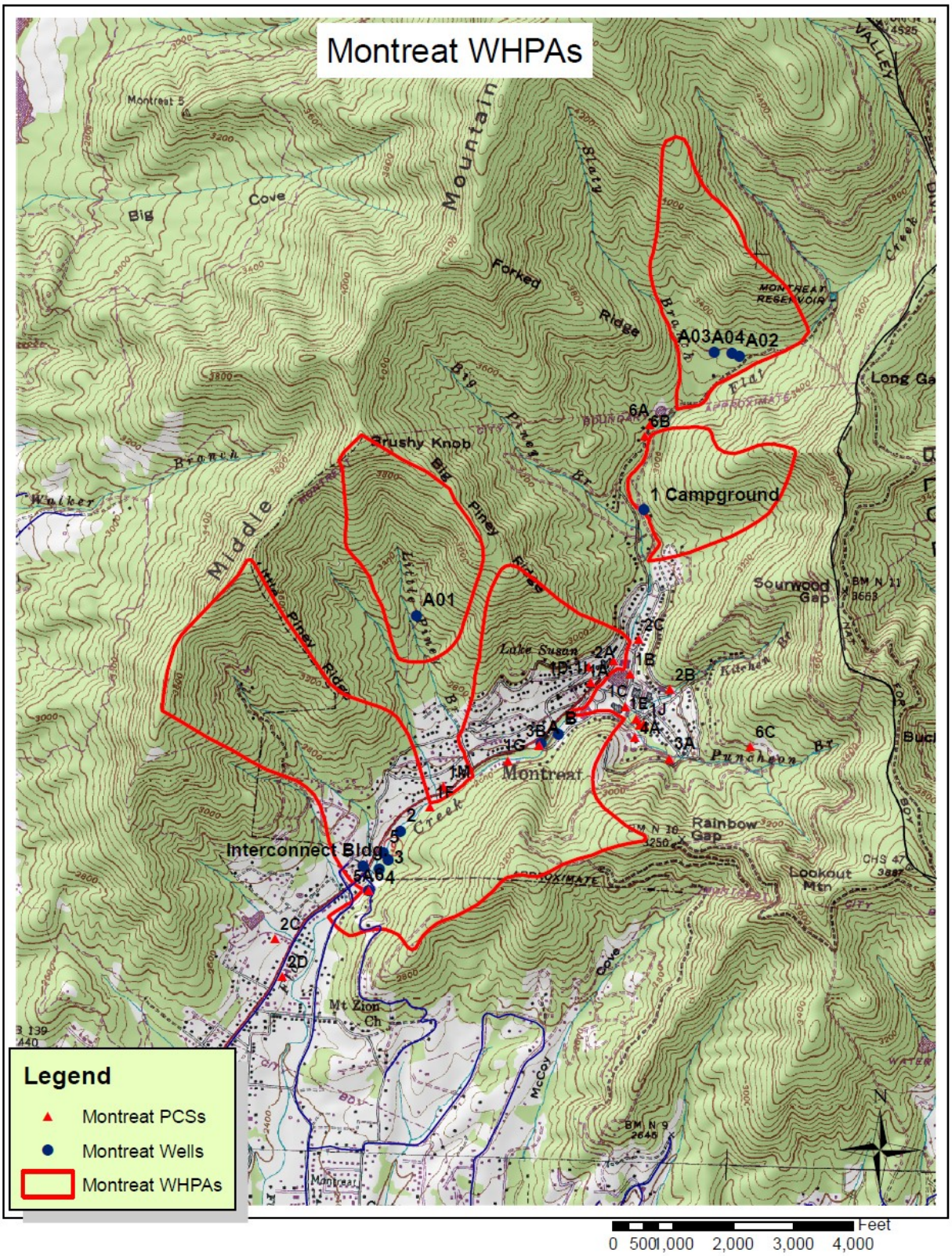
Category	Map Code
Underground Storage Tanks (USTs)	1
Household Fluids	2
Fertilizer Application	3
Chemical Mixing/Storage	4
Fertilizer/Pesticide Storage	5
Septic Tank Systems	6
Laundromats/Dry Cleaners	7

Table 4. PCS Inventory

Map Code	Contaminant Site	Contaminants	Volume
1A	Assembly Inn 669-2911	Heating Oil UST	10,000 gallons
1I	Montreat Conference Center (Incident #17435) Kitchen Branch Creek	Heating Oil Leak	See notes p. 12
1D	Conference Center 401 Assembly Drive 669-2911	Heating Oil UST Cleaning Fluids	1,000 gallons small quantities
2A	William Black Lodge 324 North Carolina Terrace	Common Household Maintenance Fluids	Small quantities
3B	Welch Field	Fertilized	Small quantities
5A	Town of Montreat Service Office (Maintenance Area) 96 Rainbow Terrace 669-8002	Pesticide Storage	Small quantities
6A	Rev. and Mrs. J. Whitner Kennedy 609 Greybeard Trail 669-4353	Septic Tank - Biological	Small quantities
6B	Dr. Margaret Brown Neville 601 Greybeard Trail	Septic Tank	Small quantities
1F	Calvin Thielman Residence (Incident #19984) 120 Assembly Drive 669-7381	Heating Oil Leak	See notes p. 12
1G	Scarborough Property (Incident #21607 & 20874) 181 Texas Road Extension 803-469-7721	Heating Oil Leak	See notes p. 12

Out of the Wellhead Protection Area

Map Code	Contaminant Site	Contaminants	Volume
6C	Spencer Robinson - Out 347 Oklahoma Road	Septic Tank	
1B	Winsborough - Out Assembly Circle 669-2911	Heating Oil UST	10,000 gallons
1C	Anderson Auditorium - Out Lookout Road 669-2911	Heating Oil UST	10,000 gallons
2B	South Carolina Home - Out 400 South Carolina Terrace	" "	Small quantites
2C	Glen Rock Inn - Out 421 Kentucky Road 669-7511	" "	Small quantities
3A	Soccer Field - Out Montreat College	Fertilizer	Small quantities
4A	Montreat Conference Center - Out 350 Texas Road 669-2911	Swimming Pool Chemicals- chlorine, soda ash, sodium bicarbonate	
1D, 4B	Montreat College - Out 669-8011	Fuel Oil UST Cleaning fluids Fertilizer, Herbicides Paint	1,000 Gallons Small Quantities
7A	Montreat College - Out 669-8011	13 Washers, Dryers	
1J	Montreat College – Morgan Science Building (Incident #16522) - Out	Heating Oil Leak	See notes p. 12
1K	Montreat College Missouri Road (Incident #5317) - Out	Heating Oil Leak	See notes p. 12
1L	Montreat College (Incident #3317) - Out	Heating Oil Leak	See notes p. 12
1E	Montreat College - Out 669-8011	Fuel Oil USTs Gym Belk Davis Library Anderson Howerton Gaither	 1,000 Gal. 8,000 Gal. 8,000 Gal. 10,000 Gal. 10,000 Gal. 6,000 Gal. 8,000 Gal.
2C	Merrimac/Camp Timberlake - Out Montreat Road	Household Maintenance Fluids	Small Quantities
2E	Shadybrook Assisted Living - Out	Cleaning Fluids	Small Quantities
1M	Emerson Residence - Out	Heating Oil Leak	See notes p. 12
1H	Wilson Building (Incident #17636) - Out 358 Texas Road	Heating Oil Leak	See notes p. 12


Montreat WHPAs
Legend
Montreat PCSs
Montreat Wells
Montreat WHPAs
Feet
0 500 1,000 2,000 3,000 4,000
A03
A04
A02
6A
6B
1 Campground
Brushy Knob
A01
Interconnect Bldg
5A
4
3
2
2C
2D
1M
1E
1G
3B
A
B
1C
1E
J
4A
3A
6C
1B
2A
2B
Montreat
Rainbow Gap
Lookout Mtn
Sourwood Gap
Lake Susan
Mt Zion Ch
Big Piney Ridge
Middle Mountain
Forked Ridge
Big Cove
Walker Branch
Slaty Branch
Big Piney Br
Little Piney Ridge
Punchon Br
Kitchen Br
McCoy Cove
Montreat 5
MONTREAT RESERVOIR
Long Ga
Buck
APPROXIMATE
CITY
BOUNDARY
N

Risk Assessment Method for this WHPP

For each WHPA, the PCSs must be ranked according to the threat each poses to the water supply well or wells. A simplified ranking scheme that assigns each PCS to a risk category of higher, moderate, or lower risk base on published information may be employed. (see appendix) However, this risk categorization must be used in conjunction with other information in order to complete the final PCS ranking for the WHPA. For example, a moderate risk PCS may be of more concern than a higher risk PCS located at a greater distance from the water supply well.

A Risk Assessment for Montreat was conducted using the following approach. A numerical score was assigned to each risk category (e.g., higher – 3, moderate – 2, and lower – 1). For each PCS, this "category" score was then multiplied by a "proximity" score to produce a risk score for the PCS. For a given WHPA, a proximity score could be assigned to each PCS with the following equation:

proximity score = 1- (distance from the well/radius of the WHPA)

The result is a relative ranking of each PCS within a given WHPA according to the threat it poses to the water supply well. Assessing the relative risk of contamination within each WHPA from the PCSs it contains allows for a determination of (1) which water supply wells are at greatest risk of contamination, and (2) which PCSs should be considered first with respect to wellhead protection. Once the risk assessment is carried out, priorities can be set to more effectively manage the PCSs. The Risk Assessment follows.

Because of the proximity of Montreat's wells to each other and the way they are situated in non uniform WHPAs, the largest radius calculated for any of their wells, 1,781 feet, is the number used for all of the PCSs in calculating its risk assessment. In the table that follows showing each PCS risk to each well, the negative numbers indicate that the PCS is farther away from the respective well than the largest radius figure. The pink shading shows the PCSs that are of highest risk to the respective well.

All of the new **Wells – A01, A02, A03, and A04**, are located adjacent to property that has now been permanently conserved by the Montreat Conference Center under a conservation easement through the Southern Appalachian Highlands Conservancy. No development has occurred around the property and as a result of the easements, will not be allowed in the future. The only activity allowed in WHPA A01, A02, and A03 is passive recreational uses such as hiking on established trails, and that would be considered a Low Risk Potential Contaminant Source.

Well # 1 – Because Well #1 is hydraulically up gradient from the Town and is geographically separated from the Town and the other wells, a separate risk assessment was done for this well. There are only two potential contaminant sources identified in this area and they are considered Lower Risk sources.

LOWER RISK SOURCES			
Category	**Map Code**	**Name**	**Location**
Septic Tanks	6A	Kennedy Residence	609 Greybeard Trail
	6B	Neville Residence	601 Greybeard Trail

Table 5. Montreat Risk Assessment

PCS Site	Risk	Radius (ft.)	Distance Well 2 (ft.)	Distance Well 3 (ft.)	Distance Well 5 (ft.)	Distance Well 6 (ft.)	Distance Well A (ft.)	Distance Well B (ft.)	Proximity Score 2	Proximity Score 3	Proximity Score 5
Assembly Inn	3	1782	4560	4990	4963	5594	1824	1513	-1.56	-1.80	-1.79
Montreat Conference Center (Cleaning Products)	1	1782	4035	4473	4461	5077	1311	1009	-1.26	-1.80	-1.50
Montreat Conference Center (GW Incident)	3	1782	4035	4473	4461	5077	1311	1009	-1.26	1.00	-1.50
William Black Lodge	1	1782	4164	4619	4602	4208	1492	1227	-1.34	1.00	-1.58
Welch Field	3	1782	2711	3148	3132	3725	61	393	-0.52	1.00	-0.76
Town of Montreat Service Office & Maintenance	3	1782	1128	616	679	23	3767	4091	0.37	1.00	0.62
Calvin Thielman Residence	3	1782	659	1111	1091	1727	2105	2454	0.63	1.00	0.39
Scarborough Property	3	1782	2138	2592	2571	3155	634	946	-0.20	1.00	-0.44

Table 5. Montreat Risk Assessment (Continued)

PCS Site	Proximity Score 6	Proximity Score A	Proximity Score B	Well 2	Well 3	Well 5	Well 6	Well A	Well B
Assembly Inn	-2.14	-0.02	0.15	-4.7	-5.4	-5.4	-6.4	-0.1	0.5
Montreat Conference Center (Cleaning Products)	-1.85	0.26	0.43	-1.5	-1.5	-1.5	-1.8	0.3	0.4
Montreat Conference Center (GW Incident)	-1.85	0.26	0.43	-4.5	-4.5	-4.5	-5.5	0.8	1.3
William Black Lodge	-1.36	0.16	0.31	-1.6	-1.6	-1.6	-1.4	0.2	0.3
Welch Field	-1.09	0.97	0.78	-2.3	-2.3	-2.3	-3.3	2.9	2.3
Town of Montreat Service Office & Maintenance Area	0.99	-1.11	-1.30	2.0	1.9	1.9	3.0	-3.3	-3.9
Calvin Thielman Residence	0.03	-0.18	-0.38	1.1	1.2	1.2	0.1	-0.5	-1.1
Scarborough Property	-0.77	0.64	0.47	-1.4	-1.3	-1.3	-2.3	1.9	1.4

Pink shading indicates higher risk.

Highest numbers = Highest risk

Risk Assessment from the 2010 Source Water Assessment Program Report

Source Name	Inherent Vulnerability Rating	Contaminant Rating	Susceptibility Rating
WELL #1	Moderate	Lower	Moderate
WELL #2	Higher	Lower	Moderate
WELL #3	Higher	Lower	Moderate
WELL #5	Higher	Lower	Moderate
WELL #6	Higher	Lower	Moderate
WELL B (WELL #8)	Higher	Lower	Moderate
WELL A (WELL #7)	Higher	Lower	Moderate

Risk Assessment Summary

Taking into consideration the nature and number of PCSs and the location of each PCS in relation to the well's location in each of the WHPAs, a ranking of the vulnerability of the water supply wells is as follows with the well at the highest risk being designated as number one:

1. 6
2. A
3. B
4. 2
5. 3
6. 5
7. 1

All of the new **Wells – A01, A02, A03, and A04**, are located adjacent to property that has now been permanently conserved by the Montreat Conference Center under a conservation easement through the Southern Appalachian Highlands Conservancy. No development has occurred around the property and, as a result of the easements, will not be allowed in the future. The only activity allowed in WHPA A01, A02, and A03 is passive recreational uses such as hiking on established trails, and that would be considered a Low Risk Potential Contaminant Source.

Management of the Wellhead Protection Areas

There are two methods of managing a Wellhead Protection Area. They are regulatory and non-regulatory. The Town of Montreat has chosen a non-regulatory approach, which will include the following:

A Wellhead Protection Brochure and/or newsletter will be delivered to each resident, business, agricultural operation and industry within the Wellhead Protection Area. Copies of this brochure will be made available at Town Hall and other locations deemed necessary for public education on Wellhead Protection. In general, the brochure will convey to each citizen/business the following information:

- An explanation of what groundwater is and the number of wells in their particular system;
- An explanation of the Wellhead Protection Program;
- Sources of groundwater pollution
- Tips on protecting their water supply
- Information on proper disposal of household hazardous wastes and oils (i.e. not disposed of through septic systems, pouring on ground, or through regular garbage collection);
- Information on proper use of fertilizers, herbicides, and pesticides;
- Information on household hazardous waste opportunities;
- Information on proper maintenance of heating oil tanks and septic systems
- Phone numbers to contact for more information

NC Rural Water Association personnel are available to help provide educational presentations in cooperation with the Town of Montreat to schools or civic organizations if needed. A plexiglass hydrogeological model demonstrating the water cycle, contamination at the surface and subsurface geology is used, as well as an Enviroscape surface water model that demonstrates point and non-point sources of contamination.

The Town of Montreat will provide information to each institution and business located within the WHPAs on waste handling practices, best management practices, standard operating procedures, and waste oil disposal methods which could be employed to reduce the potential for ground water contamination. The Town of Montreat will also provide information regarding the North Carolina Division of Pollution Prevention and Environmental Assistance (DPPEA) to each institution and business located within the WHPA. Owners/operators of potential contamination sources will be encouraged to contact the DPPEA. The DPPEA provides free technical and other non-regulatory assistance to reduce the amount of waste released into the air and water and on the land. The DPPEA serves as a central repository for waste reduction and pollution prevention information. The DPPEA emphasizes waste reduction through pollution prevention, encourages companies and government agencies to go beyond compliance, and provides information about the environmental permitting process. This information is provided at no charge to North Carolina businesses, industries, government agencies, and the general public upon request. For additional information, the DPPEA may be contacted at (919) 715-6500 or 800-763-0136 or http://p2pays.org/.

Personnel at Town owned and/or operated facilities will be educated on Wellhead Protection and steps

they can take to reduce the potential for contamination (e.g., information about best management practices, standard operating procedures, waste handling practices,). The Town of Montreat will also contact the State Division of Pollution Prevention and Environmental Assistance (DPPEA) to investigate steps that the Town can take to reduce the amount of waste released into the air and water and on the land at Town owned and/or managed facilities.

Owners of improperly constructed/abandoned wells identified within the WHPAs will be provided information regarding the threat posed to the water supply by these wells. Owners of improperly constructed/abandoned wells will be encouraged to have these wells properly abandoned in accordance with N.C.'s well construction standards found at 15A NCAC 2C.0100, "Criteria and Standards Applicable to Water Supply and Certain Other Wells". If information exists that a well is improperly constructed or is contributing to the contamination of groundwater, the Town of Montreat will notify the Groundwater Section, Division of Water Quality.

All owners/operators of regulated underground storage tanks (USTs) and other facilities subject to federal and/or state regulations located within the WHPA will be requested to supply documentation that their facility is in compliance with said regulations. Operators of UST's will be asked to supply the Town with a copy of their UST permit. If any UST sites are found to be non-compliant, the Underground Storage Tank Section of the State Division of Waste Management will be notified.

If an abandoned UST site is found, the Town will contact the North Carolina Division of Waste Management, UST Section, to determine if a closure report was submitted demonstrating that no soil or groundwater contamination was identified during the removal of UST's. If a closure report was not submitted, the Town of Montreat will notify the UST Section of the location of the facility within the WHPA and its proximity to a public water supply well.

For soil or groundwater incidents occurring within the WHPAs, the Town of Montreat will contact the State agencies with oversight responsibilities for remediation to ensure that remediation efforts are proceeding in a timely fashion and in accordance with any schedules established by these agencies. Through this process, the Town of Montreat will also notify the State agencies with oversight responsibilities for remediation of the location of the facilities within the WHPAs and their proximity to a public water supply well. The Town of Montreat will also contact the State agencies with oversight responsibilities for the contamination incidents and notify them of the locations of any sites issued notices of "No Further Action" occurring within the WHPAs and will request a review of this assessment.

The Town of Montreat provides a comprehensive brochure with instructions about how to dispose of recycling and other special waste or hazardous waste. A copy is included in the appendix. Citizens may contact Town Clerk Misty R. Gedlinske at (828) 669-8002, ext. 301 or by e-mail at clerk@townofmontreat.org with additional questions.

The Town of Montreat will hold a public informational meeting to educate the officials of Montreat Conference Center, Montreat College, and residents of the Towns' Wellhead Protection program and steps they can take to help protect the quality of The Town of Montreat's drinking water. Information regarding the North Carolina Division of Pollution Prevention and Environmental Assistance (DPPEA) will also be provided to participants at the meeting.

All residents in the WHPAs with septic tanks and home heating oil tanks will be distributed a copy of the Wellhead Protection Brochure and any other information the Town can obtain from County and/or State agencies on proper septic tank and heating oil tank maintenance.

The Town of Montreat has no wastewater lift stations. The wastewater collection system is owned, operated and inspected by Metropolitan Sewerage District.

The Town of Montreat will contact all facilities within the WHPAs with pesticide storage or otherwise involved with the application of pesticides to ensure that they are pesticide operators licensed by the State of North Carolina and that proper records are maintained to ensure that all NC Pesticide Laws are adhered to. The Town of Montreat will provide information to these facilities on waste handling practices, best management practices, standard operating procedures, and proper waste disposal methods that could be employed to reduce the potential for ground water contamination. These facilities will also be provided with information regarding the North Carolina Division of Pollution Prevention and Environmental Assistance (DPPEA).

The Town of Montreat will notify any individual, institution or government agency installing or planning to install a regulated underground storage tank within the Town's wellhead protection area of the following regulation:

North Carolina Underground Storage Tank (UST) Regulation 15A NCAC 2N .0301 stipulates specific sitting and secondary containment requirements for UST systems installed after January 1, 1991. The rule is summarized as follows:

(1) No UST system may be installed within 100 feet of a public water supply well or within 50 feet of any other well used for human consumption.

(2) Secondary containment is required for UST systems within 500 feet of a well serving a public water supply or within 100 feet of any other well used for human consumption.

Violations of this regulation will be reported to the Division of Waste Management, Underground Storage Tank Section. The UST Section will also be notified of the location of the facility within the WHPA and its proximity to a public water supply well or any other well used for human consumption. A regulated UST system is any underground storage tank and associated piping that contains petroleum (including gasoline, diesel and used oil) or a hazardous substance as defined by the State rules (15A NCAC 2N). Tanks containing heating oil for use on the premises where stored are not regulated.

Owners of above ground storage tanks (ASTs) containing oil with a volume greater than 660 gallons or a combination of ASTs with a aggregate volume greater than 1320 gallons are subject to the Oil Pollution Prevention regulations contained in Federal Regulations found at 40 CFR 112. In most cases, these facilities must prepare and implement a Spill Prevention Control and Countermeasures (SPCC) Plan. The Town of Montreat will verify the compliance status with regard to this regulation of each subject AST located within the WHPAs. Facilities with subject ASTs found not to be in compliance with this regulation will be notified of their regulatory responsibility under this regulation. There are currently no such facilities within Montreat's WHPAs.

The Town of Montreat will contact the Division of Water Quality regarding facilities permitted to discharge wastewater to the land surface (Non-NPDES Permitted Facilities) to determine if any such operations located within the WHPA are in compliance with applicable regulatory and permit requirements pertaining to environmental protection such as routine monitoring and reporting requirements. Notification will be made to the Division of Water Quality if it is determined that the facility has failed to maintain compliance with any regulatory and/or permit requirements pertaining to environmental protection such as routine monitoring and reporting requirements.

The Town of Montreat will contact the Division of Water Quality regarding facilities with NPDES permits to determine it all such NPDES discharges are in compliance with applicable regulatory and permit requirements pertaining to environmental protection such as routine monitoring and reporting requirements. Notification will be made to the Division of Water Quality if it is determined that the facility has failed to maintain compliance with any regulatory and/or permit requirements pertaining to environmental protection such as routine monitoring and reporting requirements. There are currently no such facilities within Montreat's WHPAs.

Emergency Contingency Plan

The primary person responsible for implementing the emergency contingency plan is the Town Administrator. The back-up person responsible for implementation is the Public Works Director.

Should major oil or chemical spill occur within the Wellhead Protection Area, appropriate emergency agencies would be notified. The first of these would include the Black Mountain Fire Department and the Buncombe County Emergency Coordinator.

Black Mountain Fire Department

911

Buncombe County Emergency Coordinator

828-255-5638

If power is lost to the wells there is a 30KW emergency generator to supply power to the wells. The Town is in the process of acquiring and retrofitting wells with emergency generators.

If evidence exists that indicates that a well is contaminated, it will immediately be taken off line and not returned to service until it is determined that water quality from the impacted well is in compliance with standards governing public water supplies. If one of Montreat's wells were to become contaminated, it would be isolated from the rest of the system by the shut off of valves. If it were determined that contaminants had entered the distribution system, residents would be notified by door-to-door contact not to drink the water until further notice. The regional office of the Public Water Supply Section would be notified immediately of the situation and asked for assistance. Sampling (i.e. bacteriological, VOCs, SOCs, etc.) would begin to determine the contaminant involved and the extent of contamination. A systematic flushing of the distribution system would begin with follow-up sampling conducted as needed until the system was determined to be free of contamination and in compliance with standards governing public water supplies. After consultation with the Public Water Supply Section, residents would be notified that Montreat's water was once again safe for consumption.

Short-term contingency plan - The Town of Montreat has 600,000 gallon of storage capacity for finished water, so if tanks are full and an emergency occurs, they would have, depending upon the time of year, up to seven days worth of water on hand to supply demand.

Long-term contingency plan – The Town of Montreat has an emergency interconnect with the Town of Black Mountain and can either receive water from or supply water to the Town in the event of emergency. In turn the Town of Black Mountain is interconnected with the City of Asheville and can supply or receive water from them.

Emergency Contact Numbers and Additional Resources:

Name	Resource
Ron Nalley Home: 828-664-1799 Cell: 828-779-6224 townadmin@townofmontreat.org	Emergency Response (Primary person responsible for implementing emergency contingency plan)
Steve Freeman Home: 828-625-1341 Cell: 828-779-6226 publicworks@townofmontreat.org	Emergency Response (Secondary person)
Public Water Supply Section 1634 Mail Service Center Raleigh, NC 27699-1634 919-715-2853	Technical Assistance Regulatory Guidance
NC Department of Environment & Natural Resources, Washington Regional Office 59 Woodfin Place Asheville, NC 28801 828-251-6208	Regional Water Quality Section, Public Water Supply Section, UST Section, Groundwater Section, Hazardous Waste Section Spills, Regulatory information and technical assistance
Department of Transportation State Traffic Engineer Mr. Ken Ivey 1561 Mail Service Center Raleigh, North Carolina 27699-1561 252-733-3915	WHPA Signs, emergency spill notification
NC Army National Guard 130 SIG Bn Brevard Rd Asheville, NC 828-271-5003	Emergencies, as available: Generators, 400-gallon water trailers, bottled water, transportation
NC Rural Water Association Post Office Box 590 Welcome, NC 27374 336-731-6963	Technical assistance Education
North Carolina Cooperative Extension Service Campus Box 7602 North Carolina State University Raleigh, NC 27695-7602 919-515-2811 www.bae.ncsu.edu	Educational brochures, publications

US EPA Regional Office AST/SPCC Program Region IV 61 Forsyth Street Atlanta, GA 30365-3415 404-562-8761 www.epa.gov/oilspill	Above ground storage tank information
US EPA Regional Office GW & UIC Section Region IV Atlanta Federal Center 61 Forsythe St. Atlanta, GA 30303-8960 www.epa.gov	Educational brochures, publications
Division of Pollution Prevention and Environmental Assistance Ron Pridgeon 1639 Mail Service Center Raleigh, NC 27699-1639 919-715-6517 www.p2pays.org	Technical and non-regulatory assistance to reduce waste
National Small Flows Clearinghouse West Virginia University Post Office Box 6064 Morganton, WV 26506-6064 800-624-8301 www.nesc.wvu.edu/nsfc/nsfc_index.htm	Pamphlets, brochures, training aids

Public Participation

The Town of Montreat posted a notice in the local newspaper explaining to its citizens what a Wellhead Protection Program is and how they have the opportunity to review Montreat's WHPP and make comments. Any substantive comments received from the public will be incorporated into the final version of Montreat's WHPP. A copy of the public notification showing the date the notification was published is included with this document.

New Public Water Supply Wells

The Town of Montreat will amend its Wellhead Protection Plan to include any new well(s) added to its water system. The following steps will be taken to address any new wells added to the water system.

(1) Develop a preliminary WHPA for the proposed well in order to determine the area of vulnerability.

(2) Develop a contaminant source inventory for the preliminary WHPA.

(3) Submit the information obtained in items 1 and 2 above to the WPC committee identified in Section 1. Any information required by the Public Water Supply Section (PWSS) relating to the development and construction of new public water supply (PWS) wells must also be submitted.

(4) If the WPC committee grants provisional approval of the proposed WHP Plan and the PWSS grants approval to construct or expand the PWS well or well system, then work may proceed with well construction.

(5) Finalize the WHPA delineation for the new well.

(6) Finalize the contaminant source inventory for the WHPA.

(7) Submit finalized WHPA and contaminant source inventory to the WPC committee.

(8) Once approval is received, implement any necessary regulatory and or non-regulatory potential source management practices.

(9) Submit the amended WHP Plan and all necessary supporting information to the PWSS for review and approval.

Future Wellhead Protection

The Town of Montreat is aware that an effective local Wellhead Protection (WHP) Program is an ongoing process requiring monitoring of the Wellhead Protection Areas (WHPAs) and periodic review and updating of an approved WHP Plan. Therefore, The Town of Montreat's WHP Committee will monitor the WHPAs for any new or previously unidentified potential contaminant sources (PCSs) and activities occurring within the approved WHPAs. The Town of Montreat will amend the PCS inventory and other Plan components (e.g. the management strategies, emergency contingency plan, etc.) as necessary to incorporate any new threats to the Town's ground-water source of drinking water. Additionally, the PCS inventory will be updated annually using the same procedures used to develop the original PCS

inventory. The Town of Montreat will also fully update the WHP Plan every five years or at any time a new well is constructed for use with the Town's water supply system or a major land use changes occur within a WHPA. The individual responsible for implementation of the WHP Plan will submit notification to the Public Water Supply Section annually upon completion of the PCS inventory update or immediately following the completion of a major revision. Any amended or revised sections of the approved WHP Plan resulting from an update or revision will also be submitted upon completion.

References

North Carolina Department of Environment and Natural Resources, Division of Environmental Health , Public Water Supply Section, Source Water Protection Program Report, March 3, 2010

North Carolina Department of Environment and Natural Resources, Division of Water Quality, UST Section, Aquifer Protection Section, Asheville Regional Office Files, 2090 U.S. Highway 70, Swannanoa, North Carolina

Smutko, L. Steven, Danielson, Leon E., Jennings, Gregory D., (1995). Protecting Local Underground Water Supplies, The North Carolina Wellhead Protection Guidebook, North Carolina Department of Environment, Health and Natural Resources, Division of Environmental Management, Groundwater Section, Raleigh, North Carolina, Approved March 20, 1995.

North Carolina Department of Environment and Natural Resources, Division of Environmental Health, Public Water Supply Section, The North Carolina Wellhead Protection Guidebook, Developing a Local Wellhead Protection Program, 2003

APPENDIX

Wellsite Evaluation Information 4/4/2011 1 of 2

1. Well ID	2. Date Drilled	3. Well Location (address)	4. Water Supplied to	5. Source Aquifer (if known)	6. Well Depth (ft.)	7. Diameter (in.)	8. Depth Cased (ft.)	9. Open Hole/Screen from (ft.)	10. Date
A	May-79	Texas Road	Montreat	bedrock	500	8	90	not screened	
B	5/18/1979		Montreat	bedrock	750	8	85		5/18/1979
1			Montreat	bedrock	400	8	40		
2			Montreat	bedrock	345	8	23		
3			Montreat	bedrock	345	6	37		
4		offline	Montreat	bedrock	345	6	36		
5			Montreat	bedrock	305	6	51		
6	1/2/1989		Montreat	bedrock	545	6	36		5/28/1991
Harmony A01	3/12/2009	Harmony Lane	Montreat	bedrock	605	6	95		
A02	3/23/2009	Greybeard Trail (closest to creek)	Montreat	bedrock	605	6	95		
A03	3/30/2009	Greybeard Trail (Left looking up valley)	Montreat	bedrock	605	6	75		
A04	4/6/2009	Greybeard Trail (middle well site)	Montreat	bedrock	605	6	93		

NCRWA

	Information from Well Acceptance Test					Well Operation		Well Location			
1. Well ID	11. Length (hrs.)	12. Pumping Rate (gpm)	13. Depth to Static Water Level (ft.)	14. Pumping Level (ft.)	15. Drawdown (ft.)	16. Pumping Rate (gpm)	17. Pump Period (min/day)	18. Latitude (decimal degrees)	19. Longitude (decimal degrees)	20. Elevation	21. Water Zones
A						149	480	I have these and have mapped the wells			
B	24	80	103	161	58	80	480				
1						60	480				
2						60	480				
3						38	480				
4						57	480				
5						48	480				
6	24	60	56	212	192	60	480				113' - 115'
Harmony A01		30									300' - 305' 385' - 390
A02		30									300' - 305' 385' - 390'
A03		20									100' - 105'
A04		30									200' - 205' 405' - 410'

Databases used in the Source Water Assessment Program (SWAP) and Searched during the PCS inventory

Name: Animal Operations

Description: This database contains permitted facilities for animal operations consisting of swine, cattle, poultry and horse farms that are required to have Certified Animal Waste Management Plans (CAWMP). Division of Water Quality (DWQ) rules mandated that all facilities in operation prior to January 1, 1994 register with the division. Since January 1, 1994 any new facilities were required to obtain a CAWMP before starting their animal operation. In addition, any facilities in operation prior to January 1, 1994 were required to obtain a CAWMP by December 31, 1997. As of January 1, 1997 all new facilities were required to obtain a permit from DWQ prior to construction and be certified prior to startup, and all existing facilities were to be permitted by DWQ over the next 5 years.

Source of Data: Data was obtained from the Division of Water Quality, Aquifer Protection Section, Animal Operations Program in June of 2004. For additional information about this data, contact the Animal Operations staff by phone at 919-733-3221 or visit their web site.

Name: CERCLIS Sites

Description: The Superfund program was created by the Comprehensive Environmental Response, Compensation, and Liability Act, amended by the Superfund Amendments and Reauthorization Act. The acts established authority for the government to respond to the release/threat of release of hazardous wastes, including cleanup and enforcement actions. Long-term cleanups at National Priority List sites last more than a year while short term /emergency cleanups are usually completed in less than a year. CERCLIS is a database used by the U.S. Environmental Protection Agency to track activities conducted under its Superfund program. CERCLIS contains data on potentially hazardous waste sites that have been reported to the EPA. Sites are investigated because of a potential for releasing hazardous substances into the environment are added to the CERCLIS inventory. EPA learns of these sites through notification by the owner, citizen complaints, state and local government identification, and investigations by EPA programs other than Superfund. Specific information is tracked for each individual site.

Source of Data: Data was obtained from the Environmental Protection Agency, Region 4 office in September of 2004. For additional information about this data, contact the EPA Region 4 Waste Management Division or visit their web site.

Name: NPL Sites

Description: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), amended by the Superfund Amendments and Reauthorization Act, created the Superfund program. The acts established authority for the government to respond to the release/threat of release of hazardous wastes, including cleanup and enforcement actions. Long-term cleanups at National Priority List (NPL) sites last more than a year while short term /emergency cleanups are usually completed in less than a year. Sites are listed on the NPL upon completion of a Hazard Ranking System (HRS) screening, public solicitation of comments about the proposed site, and after all comments have been addressed. Section 105(a)(8)(B) of, CERCLA as amended, requires that the statutory criteria provided by the HRS be used to

prepare a list of national priorities among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States. This list, which is Appendix B of the National Contingency Plan, is the NPL. The identification of a site for the NPL is intended to guide EPA in determining which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with a site, identifying what CERCLA-financed remedial actions may be appropriate, notifying the public of sites EPA believes warrant further investigation; and serving notice to potentially responsible parties that EPA may initiate CERCLA-financed remedial action. Inclusion of a site on the NPL does not in itself reflect a judgment of the activities of its owner or operator, it does not require those persons to undertake any action, nor does it assign liability to any person. The NPL serves primarily informational purposes, identifying for the States and the public those sites or other releases that appear to warrant remedial actions.

Source of Data: Data was obtained from the Environmental Protection Agency, Region 4 office in September of 2004. For additional information about this data, contact the EPA Region 4 Waste Management Division or visit their web site.

Name: Non-Discharge Permits

Description: The non-discharge database identifies industrial and municipal facilities that are permitted to operate any sewer system, treatment works, disposal system, petroleum contaminated soil treatment system, animal waste management system, storm water management system or residual disposal/utilization system which does not discharge to surface waters of the state, including systems which discharge waste onto or below land surface.

Source of Data: Data was obtained from the Division of Water Quality, Aquifer Protection Section in July of 2004. For additional information about this data, contact the Division of Water Quality staff by phone at 919-733-3221 or visit their web site.

Name: NPDES Permits

Description: The National Pollutant Discharge Elimination System (NPDES) database identifies facilities permitted for the operation of point source discharges to surface waters in accordance with the requirements of Section 402 of the Federal Water Pollution Control Act. Point sources are discrete conveyances such as pipes or man-made ditches. Industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into public waters.

Source of Data: Data was obtained from the Division of Water Quality, Surface Water Protection Section in July of 2004. For additional information about this data, contact the Division of Water Quality staff by phone at 919-733-7015 or visit their web site.

Name: Old Landfill Sites

Description: This database contains sites that are old municipal landfills or dump sites which were not permitted since they pre-existed the effective date of the solid waste permitting rules. These sites are not currently in operation.

Source of Data: Data was obtained from the Division of Waste Management, Superfund Section Inactive Hazardous Sites Branch (IHSB) in July of 2004. For additional information about this data, contact the Division of Waste Management staff by phone at 919-733-4996. Since 2000 the IHSB has conducted a geographic inventory of the old landfills in 38 eastern counties. Although they are working to inventory the old landfill sites statewide, the geographic locations of these sites in the remaining counties are much less reliable. You may contact the IHSB for a list of the 38 counties.

Name: PCB Sites

Description: This database identifies generators, transporters, commercial stores and/or brokers and disposers of Polychlorinated Biphenyls (PCBs). Concern over the toxicity and persistence in the environment of PCBs resulted in the Toxic Substances Control Act that prohibited the manufacture, processing, and distribution in commerce of PCBs. Thus, TSCA legislated true "cradle to grave" (i.e., from manufacture to disposal) management of PCBs in the United States. PCBs are mixtures of synthetic organic chemicals with the same basic chemical structure and similar physical properties ranging from oily liquids to waxy solids. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment, plastics and rubber and many other applications.

Source of Data: Data was obtained from the Environmental Protection Agency, Office of Pollution Prevention and Toxics in December of 2000. As of September 2004 this data set has not substantially changed. For additional information about this data, contact the PCB staff at 202-566-0500 or visit their web site.

Name: Pollution Incidents

Description: This database contains information regarding the release of pollutants into the environment that have or are likely to have, impact on the groundwater resources of the State. The initial information regarding these releases is usually obtained from concerned citizens or responsible parties, who report a release to the Department of Environment and Natural Resources. After an incident is reported, regional office staff will investigate the reported incident and enter the results of their investigation into a statewide database. This database contains an inventory of reported incidents from a variety of sources, such as leaking storage tanks, tanker spills, animal feedlots, stockpiles and etc. Substances released into the environment include gasoline and other related compounds, chemicals, nitrates, pesticides, and other organic and inorganic contaminants.

Source of Data: There are two main sources for this data. The Division of Waste Management, Underground Storage Tank Section provided information on the pollution incidents that resulted from a leaking underground storage tank. The Division of Water Quality, Aquifer Protection Section provided information on all other pollution incidents. In August of 2004 data was obtained from the Underground Storage Tank Section. For additional information about this data, contact the UST section staff by phone at 919-733-9413 or visit their web site. In June of 2004 data was obtained from the Division of Water Quality, Aquifer Protection Section. For Additional information contact the Aquifer Protection Section staff by phone at 919-733-3221.

Name: Hazardous Waste Generators/Transporters

Description: This database has records for all hazardous waste, generators, and transporters as defined by the Resource Conservation Recovery Act (RCRA). Hazardous waste as defined by RCRA is waste material that exhibits ignitability, corrosivity, reactivity, or toxicity. Hazardous waste comes in many shapes and forms. Chemical, metal, and furniture manufacturing are some examples of processes that create hazardous waste. RCRA tightly regulates all hazardous waste from "cradle to grave" (i.e., from manufacture to disposal).

Source of Data: Data was obtained from the Environmental Protection Agency, Region 4 office in August of 2004. For additional information about this data, contact the EPA Region 4, Waste Management Division staff by phone at 404-562-8440 or visit the web site.

Name: RCRA TSD Sites

Description: Treatment/Storage/Disposal or TSD sites are facilities that are engaged in the activities of the treatment, storage, or disposal of hazardous waste. Under the Resource Conservation Recovery Act (RCRA) TSD activity can occur only at facilities that received or stored hazardous waste after November 19, 1980, the effective date of the RCRA regulations.

Source of Data: Data was obtained from the Environmental Protection Agency, Region 4 office in August of 2004. For additional information about this data, contact EPA Region 4, Waste Management Division staff by phone at 404-562-8440 or visit their web site.

Name: Septage Disposal Sites

Description: This database contains information on permitted, dedicated sites where septage is land applied. The septage management program assures that septage (a fluid mixture of untreated and partially treated sewage solids, liquids and sludge of human or domestic origin that is removed from a septic tank system) is managed in a responsible, safe and consistent manner across the state.

Source of Data: Data was obtained from the Division of Waste Management, Solid Waste Section in June of 2004. For additional information about this data, contact the Division of Waste Management staff by phone at 919-733-4996.

Name: Soil Remediation Sites

Description: This database contains information on permitted, dedicated sites where soil contaminated by leaking petroleum or chemical storage tanks can be taken for bioremediation. Bioremediation is a treatment process that uses naturally occurring microorganisms (yeast, fungi, or bacteria) to break down, or degrade, hazardous substances. These microorganisms break down organic compounds such as petroleum products that are hazardous to humans into harmless products – mainly carbon dioxide and water.

Source of Data: Data was obtained from the Division of Waste Management, Underground Storage Tank Section in September of 2004. For additional information about this data, contact the Division of Waste Management staff by phone at 919-733-9413 or visit their web site.

Name: Solid Waste Facilities

Description: Solid waste includes garbage, construction debris, commercial refuse, sludge from water supply or waste treatment plants, or air pollution control facilities, and other discarded materials. The database contains an inventory of closed, unlined landfills that were primarily operated by municipalities.

How to manage solid waste has been a problem for decades. In the early 1960s, cities and towns across the country practiced open air burning of trash. In response, Congress passed the Solid Waste Disposal Act in 1965 as part of the amendments to the Clean Air Act. This was the first federal law that required environmentally sound methods for disposal of household, municipal, commercial, and industrial waste. But the initial design of the "sanitary" landfill fouled ground water, soil, surface water, and air because of improper disposal methods. Engineers have since designed new liners and leachate treatment systems to prevent environmental degradation.

Source of Data: Data was obtained from the North Carolina Division of Waste Management, Solid Waste Section in August of 1999. As of August 2004 no changes have been made to this data. For additional information about this data, contact the Division of Waste Management staff by phone at 919-733-4996 or visit their website.

Name: Tier II Sites

Description: This database contains an inventory of facilities that store types and amounts of hazardous materials and are subject to the reporting requirements of SARA Title III Section 312, Emergency Planning and Community Right to Know Act. Tier II forms require basic facility identification information, employee contact information for both emergencies and non-emergencies, and information about chemicals stored or used at the facility including:

- The chemical name or the common name as indicated on the MSDS;
- An estimate of the maximum amount of the chemical present at any time during the preceding calendar year and the average daily amount;
- A brief description of the manner of storage of the chemical;
- The location of the chemical at the facility; and
- An indication of whether the owner of the facility elects to withhold location information from disclosure to the public.

Source of Data: Data was obtained from the Division of Emergency Management in July of 2004 that included the Tier II forms submitted to the division describing chemical storage information for the year 2000. As of June 2003 no new data was available. For additional information about this data contact the Division of Emergency Management staff at 919-733-3899.

Name: UIC Permits

Description: The UIC program permits Class V injection wells that do not inject waste into the subsurface. Examples of permitted Class V facilities include heat pump/air conditioning water wells, remediation wells, tracer wells, and experimental technology wells.

Source of Data: Data was obtained from the Division of Water Quality, Aquifer Protection Section in July of 2004. For additional information about this data, contact the Division of Water Quality staff by phone at 919-733-3221 or visit their web site.

Name: UST Permits

Description: An underground storage tank system (UST) is a tank and any underground piping connected to the tank that has at least 10 percent of its combined volume underground. The federal UST regulations apply only to underground tanks and piping storing either petroleum or certain hazardous substances. These facilities are regulated under Subtitle I of RCRA and must be registered with the state and receive an operating permit annually. Until the mid-1980s, most USTs were made of bare steel, which is likely to corrode over time and allow UST contents to leak into the environment. Faulty installation or inadequate operating and maintenance procedures also can cause USTs to release their contents into the environment. The greatest potential hazard from a leaking UST is that the petroleum or other hazardous substance can seep into the soil and contaminate groundwater. A leaking UST can also present other health and environmental risks, including the potential for fire and explosion. The facilities shown in this database have tanks registered with the UST Section.

Source of Data: Data was obtained from the Division of Waste Management, Underground Storage Tank Section in July of 2004. For additional information about this data, contact the Division of Waste Management staff by phone at 919-733-9413 or visit their web site.

Potential Contamination Sources by Risk Category

Higher Risk Potential Contamination Sources for Ground Water PWS Systems

COMMERCIAL/INDUSTRIAL

- Automobile body shops; Gas stations; Repair shops
- Chemical /petroleum processing/storage
- *Sewer lines
- Utility right-of-way/pesticide use
- Chemical/petroleum pipelines
- Wood/pulp/paper processing and mills
- Dry cleaners
- Electrical/electronic manufacturing
- Fleet/trucking/bus terminals
- Furniture repair/manufacturing
- Home manufacturing
- Junk/scrap/salvage yards
- Machine shops
- Metal plating/finishing/fabricating
- Mines/sand or gravel excavations
- Parking lots/malls (>50 spaces)
- Photo processing/printing
- Plastics/synthetics producers
- Research laboratories

OTHER

- Road salt storage areas
- Military installations(for classified risks not otherwise listed)

AGRICULTURAL/RURAL

- Farm machinery repair
- Rural machine shops
- *Intensive livestock operations; Lagoons, spray fields
- Fertilizer, pesticide, and petroleum storage, distribution, handling, mixing, and cleaning areas
- *Sewage sludge (biosolids) storage, handling, mixing and cleaning areas
- *Sewage sludge (biosolids) land application
- Unauthorized/illegal disposal of wastes/chemicals

RESIDENTIAL/MUNICIPAL

- Airports - maintenance/fueling areas
- Railroad yards/maintenance/fueling areas
- Landfills/dumps
- Utility stations - maintenance areas
- *Septic systems - high density (>1/acre)
- *Sewer lines
- *Stormwater drains/discharges
- Fertilizer, pesticide, sewage sludge

Notes:

1. *This is a list of potential sources of contamination, not a list of known databases of contaminants.*
2. *Higher risk potential contaminant sources are considered to have a higher potential for drinking water contamination than those designated moderate risk or lower risk. Facility-specific management practices are not taken into account in estimating risks and assigning these categories.*
3. *An asterisk [*] indicates activities that may be associated with microbiological contamination.*

Potential Contamination Sources by Risk Category (Con't)

Moderate Risk PCSs

COMMERCIAL/INDUSTRIAL

- Car washes
- Cement/concrete plants
- Food processing
- Hardware/lumber/parts stores

AGRICULTURAL/RURAL

- *Auction lots
- *Boarding stables
- Crops, irrigated (berries, Christmas trees, hops, mint, orchards, vineyards, nurseries, greenhouses, vegetables, sod)

NOTE: Drip-irrigated crops are considered lower risks.

Drinking water treatment plant residuals/sludge application

RESIDENTIAL/MUNICIPAL

- Drinking water treatment plants
- Golf courses
- Housing – high density (>1 house/.5 acres)
- Motor pools
- Parks
- Waste transfer/recycling stations
- Wastewater treatment plants/collection

OTHER

- Above ground storage tanks
- Construction/demolition areas
- Hospitals
- Transportation corridors
- Freeways/state highways, Railroads, Right-of-way maintenance (herbicide use areas)
- Irrigation, water supply, or monitoring wells

Lower Risk PCSs

COMMERCIAL/INDUSTRIAL

- Office buildings/complexes
- RV/mini storage

AGRICULTURAL/RURAL

- Crops, non-irrigated (grains, grass seeds, hay)
- *Rangeland
- Managed forests/silviculture

RESIDENTIAL/MUNICIPAL

- Apartments and condominiums
- Campgrounds/RV parks
- Fire stations
- Schools
- Housing – low density (< 1 house/.5 acres)

OTHER

- Medical/dental offices/clinics
- Veterinary offices/clinics

SOURCE: Adapted from EPA (1993), and from the Oregon Wellhead Protection Program

Glossary of acronyms and abbreviations

ARO - Asheville Regional Office
EPA - Environmental Protection Agency
DWQ - Division of Water Quality
UST - Underground Storage Tank
AST - Above ground Storage Tank
VOC - Volatile Organic Compound
SOC - Semi-volatile Organic Compound
NCDEH - North Carolina Department of Environmental Health
PWS - Public Water Supply
PWSS - Public Water Supply Section
NCDENR - North Carolina Department of Environment and Natural Resources
WPC - Wellhead Protection Committee
WHPP - Wellhead Protection Program
WHPA - Wellhead Protection Area
Gpm - gallons per minute
GPD - gallons per day
Ppm - parts per million
Ppb - parts per billion
CAP - Corrective Action Plan
NOV - Notice of Violation
PCS - Potential Contamination Source
DWM - Division of Waste Management
NPDES - National Pollutant Discharge Elimination System
SPCC - Spill Prevention Control and Countermeasures
UIC - Underground Injection Control
DPPEA - Division of Pollution Prevention and Environmental Assistance

Buncombe County Landfill
85 Panther Branch Road
Alexander, NC 28701
(828) 250-5462
Hours of Operation
Monday through Friday: 8:00 a.m. - 4:30 p.m.
Saturday: 8:00 a.m. - 1:00 p.m.

Buncombe County Transfer Station
190 Hominy Creek Road
Asheville, NC 28806
(828) 250-6205
Hours of Operation
Monday through Friday: 8:00 a.m. - 4:30 p.m.
Saturday: 8:00 a.m. - 3:00 p.m.

Special Disposal Items

These items cannot be included with household garbage and must be disposed of at either the Buncombe County Landfill or Transfer Station:

Lead-Acid Batteries	**A or B**
Motor Oil	**A only**
Tires	**A only**
Household Hazardous Waste (lawn and garden chemicals, solvents, oil-based paints and stains	**A only**
Construction Debris	**A only**
Building Materials	**A only**
Wood Waste (trees, stumps, large limbs)	**A only**
White Goods (appliances and air conditioners), if not collected by the Town	**A or B**
Bulk Items (furniture, mattresses), if not collected by the Town	**A only**

A) Buncombe County Landfill
B) Transfer Station

First Name last Name
Address 1
Address 2
City, State ZIP

Town of Montreat
P.O. Box 423
Montreat, NC 28757

FIRST CLASS MAIL
U.S. POSTAGE PAID
ONE OUNCE
MONTREAT NC 28757
PERMIT No. 13

Recycling and Special Disposal information

Town of
Montreat
North Carolina

P. O. Box 423
Montreat, NC 28757
(828) 669-8002
www.townofmontreat.org

Montreat's Recycling Program: What to Recycle and How

"Blue Bag" Items:

- Glass bottles and jars (all colors)
- Aluminum, tin and steel food cans, including tops
- Plastic beverage bottles and jugs (neck of container must be smaller than the base; no tubs or bowl-shaped containers)
- Newspaper - **No More Bundling!**
- Mixed paper (magazines, office paper, junk mail, cardboard egg cartons, cereal boxes)

All of the items listed above may be placed into the same bag. Rinse all containers and remove lids. Dispose of lids in regular trash. Flatten plastic bottles and jugs. Place blue bags next to trash containers on the morning of household garbage collection day.

Corrugated Cardboard: Flatten all cardboard, tie into a bundle and place it beside the trash container

Blue bags may be purchased from any area supermarket, Wal-Mart or Sam's Club.

Fluorescent Light Bulbs: Both compact (CFL) and bar-style fluorescent light bulbs contain mercury and should not be discarded with regular household garbage. Take them to the Black Mountain Fire Department (106 Montreat Road) or the customer service counter of any Home Depot store for safe disposal.

At-home recycling kits are also available for order at **www.thinkgreeenfromhome.com.**

Note: If a fluorescent bulb is broken, DO NOT use a vacuum cleaner to remove the glass and other residue. This will spread mercury vapors and contaminate the vacuum cleaner. Sweep the contents into a sealable plastic bag, wipe down the area with a wet paper towel and ventilate the room where the bulb was broken. Bring the sealed bag containing the broken bulb and paper towels to the Black Mountain Fire Department.

Batteries: Boogie Down Electronics (504 Highway 9) in Black Mountain accepts alkaline, button cell (typically used in hearing aids and watches) and rechargeable household batteries for recycling. Automotive batteries may be taken to Advance Auto Parts (1407 US Highway 70) in Black Mountain.

Cell Phones: Used cell phones (including battery chargers) may be turned in at the Town Services Office.

Computers and Electronic Equipment: Goodwill Industries accepts computer hardware and other office-related electronic equipment (CPU towers, monitors, mice, keyboards, printers, scanners, fax machines, digital cameras, etc.) at any of their local stores. The closest store is located at 3018 Highway 70 in Black Mountain.

Ink and Toner Cartridges: The Black Mountain UPS Store (151-B Highway 9) accepts these items for recycling.

Latex-Based Paint Products: Unused latex-based paints and stains may be disposed of in your regular household trash if air -dried or hardened using cat litter or sand.

Medical "Sharps": Place all needles and lancets used for daily home medical treatment into a sturdy plastic container with a screw-on cap, such as a laundry detergent bottle. When the container is full, bring it to the Buncombe County Transfer Station for free disposal.

Montreat Recycles!

The Town of Montreat offers "blue bag" recycling collection as part of our sanitation services. Recyclable items are collected along with household garbage according to the following schedule:

- January - May: **Mondays Only**
- June - August: **Mondays and Fridays**
- September - December: **Mondays Only**

Town-Observed Holidays

Recyclables and household garbage will be collected on the day after **MLK, Jr. Day, Memorial Day, Independence Day** and **Labor Day.**

Dumpster Facility Recycling

"Blue bag" recyclables and flattened corrugated cardboard may also be taken to the dumpster facility located behind the Town Services Office.

Hours of Operation

September 1 - May 31

Monday through Friday, 7:00 a.m. - 5:00 p.m.

June 1 - August 31

Monday through Friday, 7:00 a.m. - 5:00 p.m.

Saturday, 7:00 a.m. - 12:00 p.m.