CHAPTER 3
AFFECTED ENVIRONMENT

3.1 INTRODUCTION

Existing environmental resources in the Project area are described in this chapter with a summary of environmental baseline information. In the following sections, "Project area" refers to the Proposed Action, and "study area" refers to land surrounding RML. The "area of potential effect" as used in the Historical Resources section refers to the Project area.

The USDHHS manual (30-50-00 NEPA Review) requires the EIS to incorporate the material required by the applicable statute or Executive Order. Those assets that may be affected are addressed in this chapter.

The following resources are potentially affected by the Proposed Action and are addressed in detail:

- Social Resources;
- Economic Resources;
- Noise;
- Visual Quality;
- Historic Resources;
- Air Quality; and
- Water Supply and Wastewater.

The following resources have been analyzed and are either not present in the Project area or would not be affected by the Proposed Action:

- Soil;
- Geology;
- Floodplains;
- Wetlands and Riparian areas;
- Vegetation;
- Fish;
- Wildlife;
- Threatened and Endangered Species;
- Environmental Justice; and
- Surface Water.

Rationale for providing no further discussion of the resources is also included in this chapter.

3.2 SOCIAL RESOURCES

3.2.1 Analysis Methods

The socioeconomic study area includes Ravalli County and the City of Hamilton. Data for the State of Montana and the United States are used where appropriate for comparison purposes.

Baseline data for Hamilton and Ravalli County include population and demographic data, land, community infrastructure information, and current economic and business statistics. Data were collected to comprehensively describe existing conditions for both the county and the city. Data contain current population statistics from the U.S. 2000 Census, including age categories and education levels. Existing land use is described using the Ravalli County Growth Policy (2002), City of Hamilton Comprehensive Master Plan (1998), and the draft City of Hamilton Growth Policy (2002). Housing information includes number of units, vacancy rates, costs, and cost-burden derived from U.S. 2000 Census reports, Ravalli County Growth Policy, and City of Hamilton's Comprehensive Master Plan. Economic information includes employment by industry, labor force, income, and public finance. Data were collected primarily from the U.S. 2000 Census, the Montana Department of Labor and Industry, and the Ravalli County Economic Needs Assessment (Swanson 2002).

3.2.2 Affected Environment

Ravalli County was established in 1893 and named for Jesuit Missionary Father Anthony Ravalli, who settled in the region in 1845. County residents value the rural character of living close to nature and have a strong concern about the fate of the area's land, natural resources, local businesses, and quality of life.

The City of Hamilton, the largest community in Ravalli County, was incorporated in 1894 and named after James Hamilton, a Marcus Daly employee who platted the town along the route of the Northern Pacific Railway in 1890. Hamilton was a company town revolving around the activities of Daly's large lumber mill, owned by the Anaconda Copper Mining Company, and Bitterroot Stock Farm. Most of the residents worked for the Daly interests, living in company homes and shopping in company stores. By the time Daly died in 1900, Hamilton was the commercial center of the Bitterroot Valley and the seat of Ravalli County.

Population Trends and Demographic Characteristics

Ravalli County is one of Montana's fastest growing counties. It was one of the fastest growing counties in the U.S. during the 1990s. In the last decade, net in-migration resulted in more than 10,500 new residents to the valley, an increase of 44.2 percent in 10 years. Hamilton is one of the fastest growing communities in Montana as well. The population increased from 2,737 in 1990 to 3,705 in 2000, a net increase of 35 percent during the 10-year period. In comparison, Missoula County, the region's main population center, grew 21.75 percent, and the state's population growth was 12.9 percent from 1990 to 2000 (**Table 3-1**). Ravalli County is growing faster than Hamilton. In the 1960s, Hamilton's population was 20 percent of the county; in 2000, it was only 10 percent of the county.

According to the Ravalli County Economic Needs Assessment (Swanson 2002), "about 95 percent of this recent population growth is the result of much higher rates of net in-migration to the county (which considers only new residents who have declared Ravalli County as their permanent residence)."

Many of the newcomers visited and decided to relocate to the area. Others are previous residents returning to the area, retirees, and in-migrants from nearby Missoula, which continues to grow as the regional employment and retail center. High rates of net in-migration have developed in many areas of the interior west, as people move to take advantage of the area's quality of life and proximity to National Forests and outdoor recreational opportunities. The valley has good access to airline service and to cultural and social activities in Missoula. A low crime rate and moderate climate enhance the area's desirability.

The Ravalli County population (**Table 3-2**) aged between 1990 and 2000, with large increases in the 45-64 year-old age group. The 65 and older group decreased as a percentage of the total population. Median age of county residents was 41.1 years in 2000, up from 37.8 years in 1990. The median age for the state's population in 2000 was 37.5 years. Aging of the population is expected to increase and continue to be a demographic factor, producing a lower birth rate. In 1980, the birth rate was 15.8 per 1,000, falling to 9.8 by 2000. This compares to a statewide average of 13.8 (US Census 2001).

The school population is growing more slowly than the general population. The Ravalli County Economic Needs Assessment (Swanson 2002) points out that new in-migrants to Ravalli County are people in their 40s, 50s, and 60s who are not adding to their families. If they have children still at home, they are likely high-school age and older. Education levels attained in the county match those of the state and the City of Hamilton in the percent of high school graduates, but both the county and the city have lower rates of college and graduate or professional degree holders than does the state.

Table 3-1.
Population Estimates

Area	2001 Census Estimates	2000 Census	1990 Census	% Increase 1990 -2000	% Increase 2000 - 2001
Montana	904,433	902,195	799,065	13%	2%
Ravalli County	37,304	36,070	25,010	44%	3%
Hamilton	NA	3,705	2,737	35%	NA

Source: Montana Department of Labor and Industry 2002.

Table 3-2.
Demographic Characteristics, 2000

Demographic Characteristic	Montana	Ravalli County	City of Hamilton
Total population	902,195	36,070	3,705
Gender			
Male	449,480	17,910	1,672
Female	452,715	18,160	2,033
Age Group			
0-4	54,869	2,073	220
5-9	61,963	2,477	184
10-14	69,298	2,863	215
15-19	71,310	2,662	201
20-24	58,379	1,379	181
25-34	103,279	3,570	412
35-44	141,941	5,340	479
45-54	135,088	5,854	445
55-59	47,174	2,313	152
60-64	37,945	1,950	167
65-74	62,519	2,981	348
75-84	43,093	1,949	425
85 and over	15,337	659	276
Median Age	37.5	41.1	44.3
Education (population 25 and over)			
< High School graduate	75,358	3,095	482
High School (or GED)	183,415	7,738	860
Some college, no degree	150,467	6,916	708
Associate degree	34,420	1,284	82
Bachelor's degree	100,758	3,897	423
Post Graduate	42,203	1,631	175

Source: US Census 2001.

3.2.3 Housing

Ravalli County

According to the 2000 U.S. Census, there were 15,946 housing units in Ravalli County, almost eight percent of which were multiple family units. Over 75 percent of the housing is owner-occupied, with an average of 2.48 people residing in each household. The Ravalli County Growth Policy, adopted in December 2002, notes that providing quality affordable housing is a primary community goal. According to the policy, a household is described as experiencing "cost-burden" when their housing costs exceed 30 percent of income. In 1990, the U.S. Census indicated that 16 percent of homeowners and more than 34 percent of renters were experiencing cost-burden. In 2000, these figures had increased to almost 29 percent of homeowners and 38 percent of renters. The rate of growth in household income has not kept pace with the cost of homes in Ravalli County. Between 1990 and 2000, median household income increased from $28,376 (adjusted for inflation to 2000 values) to $31,992, or 12.7 percent. In contrast, the median home value was $82,923 in 1990 (adjusted for inflation to 2000 values) and increased to $133,400 in 2000, an increase of 60.9 percent and about 134 percent of the Montana median home value of $99,500.

Hamilton

Within the city limits, 80 percent of the area is built out, with less than 15 percent vacant land remaining. The 2000 U.S. Census reports there were 1,915 housing units in the city. Of the 1,772 occupied housing units, 51 percent were owner-occupied, with 49 percent renter-occupied. On average, 1.95 persons live in each household, indicating smaller households than in the county, consistent with the higher median age of city residents. The vacancy rate is approximately four percent for homeowners and six percent for rentals. The 1998 City of Hamilton Comprehensive Master Plan states that Hamilton has a jobs-to-housing balance of 300 jobs for every 100 units of housing. The vacancy rates suggest that a substantial percentage of those employed in Hamilton do not live in the city. It is not clear whether that is by choice or necessity; some employees may live out of town for more affordable housing. Local realtors report that home prices in Hamilton currently range from $95,000 to $185,000 and that homes near RML are worth between $20,000 and $30,000 more than away from RML.

RML is located in a residential area of Hamilton. Some current residents report that the facility is not a good neighbor because of high noise volumes, steady traffic, and parking conflicts. They also note that the facility has not been maintained, with no landscaping or yard maintenance (see the Visual Quality and Noise sections in Chapter 4).

The City of Hamilton has zoned the area around RML as a Public and Institutional (PI), which is intended to "accommodate those public and institutional uses which are related to the health, safety, educational, cultural, and welfare needs of the city." The zone recognizes "government owned and operated facilities" and "other similar uses which the city finds to fall within the intent and purpose of this zone, that will not be more obnoxious or materially detrimental to the public welfare or to the property in the vicinity of the uses, and which the city finds to be of a comparable nature and of the same class as the uses enumerated" (Section 17.92.010, City of Hamilton Zoning Code). As a federal facility, RML is not obligated to follow local zoning regulations. The draft Hamilton Growth Policy (2002) confirms uses in the district.

3.2.4 Education

There are 16 public schools in Ravalli County with a total enrollment of approximately 6,280 pupils. Of the 16, there are six high schools, one middle school, seven elementary schools, one primary school, and one unclassified.

Enrollment in the PK-12 schools in the Hamilton District is approximately 1,612 (US Census 2002a). Higher education in the region includes the University of Montana and its College of Technology, both in Missoula. The Hamilton school superintendent reports that the middle school and high school have sufficient capacity to handle up to 100 new students. The elementary schools are at capacity; however, another facility is available, if necessary (Lyons 2003).

3.2.5 Community Safety

Law Enforcement

Law enforcement in Ravalli County is provided by the Montana Highway Patrol dispatched out of Missoula; the Ravalli County Sheriff's Department; and local police departments in Hamilton, Stevensville, Darby, and Pinesdale.

The Ravalli County Sheriff's Department has 31 full-time sworn officers, approximately 31 reserve deputies, 19 full-time sworn detention officers, 11 administrative and jail staff, 11 dispatchers for 911, and a disaster and emergency services coordinator. The Sheriff's Department uses a reserve deputy sheriff force and a trained group of volunteers for search and rescue activities.

The City of Hamilton Police Department has 13 sworn officers, one non-sworn full-time employee, and one part-time, non-sworn employee. The sworn officers include the chief, a sergeant, two detectives, eight patrol officers, and an animal control/parking enforcement officer.

RML currently has contracted security guards on site at all times. An NIH police force has been established at RML. A full-time captain has been hired and is currently on site, and a Sergeant was hired in January 2004.

Fire Protection

Fire protection services are supplied by 12 volunteer fire departments, with approximately 155 volunteer firefighters located throughout the Bitterroot Valley. The Hamilton Fire Department has 28 volunteer firefighters and five fire engines, one aerial truck capable of handling fires above the second floor of a building, and three water tenders. Three certified HAZMAT responders on the Fire Department work at RML and are also members of the Missoula Regional HAZMAT Team, a 40-person team available to RML to provide emergency services (Wilson 2003). In addition, RML has its own 11-member HAZMAT team.

During major fire and emergency situations that exceed the capacity of local departments and response units, the Ravalli County disaster and emergency services coordinator offers assistance to develop combined plans and actions.

Health Care

The Marcus Daly Memorial Hospital in Hamilton is the only hospital in Ravalli County. Marcus Daly cannot handle more than 10 emergency patients at a time (Bartos 2003). The 48-bed acute care facility offers 24-hour emergency care. Ambulance services are provided by Bitterroot Valley EMS (Emergency Medical Services), which currently has eight ambulances and 102 people on staff. A full range of specialty medical services are available in Missoula.

3.2.6 Transportation

Other than general city ordinances and laws, no special restrictions on traffic or parking exist for the RML campus.

Regulations concerning transportation of biological agents are aimed at ensuring that the public and workers in the transportation chain are protected from exposure to any agent in the package. Transportation of biological agents is regulated by the Public Health Service, Department of Transportation, United States Postal Service, the International Air Transport Association, and the Occupational Health and Safety Administration. Transportation of the various agents currently studied at RML or potentially studied in the Integrated Research Facility is described in detail in **Appendix C**. RML is currently meeting requirements for transporting biological agents.

Information for the transportation analysis was gathered from the Hamilton Transportation Plan 2002 (Morrison Maierle, Inc. 2002). Existing traffic counts were used and base traffic projections were developed through historical roadway growth rates. Existing land use characteristics were used, and forecast land use projections were developed through interviews with city staff and historical population data from the U.S. Census Bureau.

Investigation of accident records for the past three years indicates that, in general, accident rates for Hamilton City collector streets have been average. Nearly 69 percent of the recorded collisions occurred on U.S. Highway 93; 16 percent occurred on a four-block section of Main Street (Morrison Maierle, Inc. 2002).

The four traffic signals in Hamilton (three on U.S. Highway 93 and one on Main Street) are functioning adequately or have been scheduled for upgrades in the near future. Currently, new signals may be warranted at two locations on U.S. Highway 93, one at Pine Street and another at Ravalli Street (seven blocks and three blocks north of RML, respectively).

Near RML, 7th and 4th streets are local collector streets, while the remaining streets in the area are considered residential. Both types of streets function primarily as access to abutting properties, with typically low traffic volumes. They carry less than 1,000 vehicle trips per day (Morrison Maierle, Inc. 2002).

Traffic into RML currently enters through the main gate at the corner of 4th and Grove streets (see Figure 2-1). During periods of heightened security, when vehicles entering the campus must be searched, traffic congestion is a problem as employees arrive for work. Many choose to park their vehicles along city streets instead of on campus, which causes parking problems near the site. Adequate visitor and employee parking is currently available without using adjacent streets.

The Hamilton Transportation Plan recommended that 7th Street from Adirondac Avenue to Desta Street (near RML, see Figure 2-1) have pavement replaced and curbs, gutters, and sidewalks upgraded to provide added capacity, improve surface drainage, and provide dedicated residential parking areas and dedicated pedestrian/bicycle facilities.

3.3 ECONOMIC RESOURCES

Ravalli County has experienced several boom/bust economic cycles based first on fulfilling the timber needs of the mines in Butte and Anaconda and then on orchard agriculture that relied on extensive irrigation systems. By 1915, easily accessible timber had been cut and the sawmill closed. In 1917, financial problems of the "Big Ditch" had peaked, and the orchard business went bust. The local economy was depressed and uncertain until RML was established in 1927 to research the cause of Rocky Mountain spotted fever. Hamilton actually grew during the 1930s when the rest of the country was experiencing a depression. Ravalli County and Hamilton are currently experiencing another economic boom because of the rapid population growth, apparently spurred by urban professionals wanting a rural, outdoor quality of life.

According to the Ravalli County Economic Needs Assessment (Swanson 2002), the economy is increasingly "growth driven" and "growth dependent," with most employment and income growth associated with people moving to the area and the resulting real estate development and construction activity. Concerns exist that high levels of population growth cannot be maintained indefinitely because the growth is based on the attractiveness and desirability of the area, highlighting the volatility of the current economic situation. The Ravalli County Growth Policy (2002) lists major goals of encouraging economic growth in order to provide both good pay and good profit, and supporting the Ravalli County Economic Development Authority. The City of Hamilton Draft Growth Policy (2002) lists protecting the rural way of life without neglecting economic growth as a major community goal. The Ravalli County Economic Needs Assessment (Swanson 2002) lists developing quality businesses and job growth as one of three points of an economic development strategy by:

- Increasing the number of good paying jobs for skilled and educated workers with jobs paying above the area average; and
- Increasing the number of jobs that can serve as "ladders" for elevating area workers from low paying, low-skill jobs.

The report specifically identifies the bioresearch and biotechnology fields.

3.3.1 Employment

Along with the influx of population during the 1990s came a construction boom that has kept many contractors in the Bitterroot Valley actively engaged in building homes and commercial developments. In addition to construction activities, much of the boost in the valley's economy has been in services (2,242 employees) and retail trade (2,086 employees) (**Table 3-3**). According to the Ravalli County Economic Needs Assessment (Swanson 2002), growth in the service sector outpaces employee and income growth in any other sector. Not only are the jobs increasing, but the pay is also getting better, probably due to the increase in health services jobs. Retail trade is also growing because of the "growth driven" economy.

Despite losses in agricultural land over the last 10 years, agricultural production in Ravalli County remains strong. According to 2000 USDA County Profile, Ravalli County ranks second (out of 56 Montana counties) in dairy production, seventh in hay production, eleventh in oat production, thirteenth in alfalfa production, and above average in production of beef cows and heifers, cattle, sheep and lambs, and pigs.

The top 10 private employers in Ravalli County are Albertson's, Corixa, Discovery Care Center, Farmers State Bank, Fox Lumber Sales, Marcus Daly Memorial Hospital, Rocky Mountain Log Homes, Selway Corporation, Stock Farm Club, and Valley View Estates Health Care Center (Montana Department of Labor and Industry 2001).

Government employment is especially important to Ravalli County because it is a steady source of outside dollars coming into the county, thereby contributing to the economic base. Each economic base dollar generates about two dollars (Swanson 2002), whereas dollars earned from inside the community generate only one dollar. Employment at public schools, RML, and the U.S. Forest Service make up the majority of government jobs.

Table 3-3.
Ravalli County Employment by Industry

Industry	Average Annual Employed	Annual Wages Paid
Agriculture, Forestry, Fish	311	$ 5,213,462
Mining	4	$ 142,609
Construction	659	$ 15,587,371
Manufacturing	1,129	$ 33,360,408
Transportation, Communications, and Utilities	345	$ 8,413,587
Wholesale Trade	313	$ 9,595,714
Retail Trade	2,086	$ 28,058,822
Finance, Insurance, and Real Estate	445	$ 11,402,785
Services	2,242	$ 45,496,603
Nonclassifiable	12	$ 456,537
Private Business	**7,552**	**$157,498,717**
Government	1,782	$ 50,897,183
Total All Industries	**9,334**	**$208,395,900**

Note: Totals may not agree due to nondisclosure of confidential industry data or to rounding.

Source: Montana Department of Labor and Industry 2002.

In 1990, the last period for which data was published, an estimated 15 to 20 percent of employed Ravalli County residents commuted to work in Missoula County. Over three percent of all employees in Ravalli County commuted from Missoula County (Montana Department of Labor and Industry 2002).

The unemployment rate of Ravalli County has been higher than the state rate since 1990, ranging from 10.8 percent in 1991 to a low of 4.6 percent in 2001. The state unemployment rate in 2001 was also 4.6 percent (**Table 3-4**).

3.3.2 Income

Personal income is defined as all income received by individuals from all sources – income from work (labor income or earnings), income from savings and investments (investment income), and income from outside sources such as Social Security or Medicare (transfer payment income). The Ravalli County economy has undergone an important shift in its income base as a result of the population and demographic dynamics of the 1990s. According to the Ravalli County Economic Needs Assessment (Swanson 2002), investment income and transfer payment income grew during this period while labor earnings saw gain. Labor earnings accounted for less than 54 percent of all personal income in the county in 2002; non-labor income is expected to increase to over half of the total income by 2010. Labor earnings account for about 60 percent of personal income in Montana and for about 65 percent of all income in the nation. The Ravalli County Economic Needs Assessment (Swanson 2002) notes that the greatest deficiency in the area's economy is the relatively low level of per worker earnings, both for wage and salaried employees and for proprietors (**Table 3-5**).

Table 3-4.
Ravalli County Annual Average Labor Force

Year	Labor Force	Unemployed	Unemployment Rate
2001	18,163	840	4.6%
2000	18,272	950	5.2%
1999	17,730	1,072	6.0%
1995	15,973	966	6.0%
1991	12,251	1,328	10.8%

Source: Montana Department of Labor and Industry 2002.

Labor income is income from work or earnings. Average annual wages for all Ravalli County industries ($22,326) in 2000 lagged behind the state ($24,275) by approximately nine percent. The mining sector in Ravalli County, although employing an average of only four employees in 2000, paid the highest wage in the county at $36,652, while the retail trade section paid the lowest average annual wage of $13,451 (Montana Department of Labor and Industry 2001). Government workers (federal, state, and local, including public education) constituted 19 percent of the total workforce, earning an average annual wage of $28,562.

RML has approximately 250 federal employees, fellows, and facility contractors (not including construction workers) and an annual payroll of $10.4 million for fiscal year 2003.

Per capita income (**Table 3-5**) is calculated by dividing all personal income received by all permanent county residents by the total county population. Per capita income was listed as $16,560 in 1997, an 11 percent gain over the 1987

Table 3-5.
Comparison of Per Capita Personal Income, 1970-2000

Year	U.S.	Montana	Montana % of U.S.	Ravalli County	Ravalli County % of U.S.	Ravalli County % of Montana
2000	$29,469	$22,518	76%	$18,959	64%	84%
1995	$23,255	$18,592	80%	$16,036	69%	86%
1990	$19,572	$15,516	79%	$13,660	70%	88%
1980	$10,183	$ 9,143	90%	$ 7,507	74%	82%
1970	$ 4,095	$ 3,625	89%	$ 3,029	74%	85%

Source: Montana Department of Labor and Industry 2002.

level. The latest estimate is $17,235 for 2000, a four percent gain over the 1997 level. Montana is ranked 47th in personal per capita income in the nation, and Ravalli County is 35th of the 56 counties in the state (US Census 2002a).

Poverty levels indicate the percentage of the population with incomes below that necessary for basic necessities – adequate housing, food, transportation, energy, and health care. The 2000 U.S. Census reports that 13.8 percent of Ravalli County residents were classified as living in poverty, based on the national poverty threshold. At the same time, poverty levels were estimated at 14.6 percent of the state's population and at 11.8 percent of the nation's population.

3.3.3 Government and Public Finance

According to the Ravalli County Economic Needs Assessment (Swanson 2002), the high rate of population growth is causing economic restructuring in the county. The report presents evidence that in the midst of this fast growth, local government officials are hard pressed to meet the growing demand for services that rapid population and other growth brings with the constrained revenues available. In Ravalli County, both taxing and spending for local governments and special districts are low.

The two primary sources of local government revenues are intergovernmental transfers (funds passed through from federal and state governments, such as grants-in-aid and payments in lieu of taxes for federally owned land) and local taxes and assessments. The Ravalli County Economic Needs Assessment (Swanson 2002) notes that, in 1997, total revenue for local governments in Ravalli County was $45 million (1997 is the last year for which data has been reported). Of that total:

- Intergovernmental transfers accounted for $22.4 million, or 50 percent of the total;
- Taxes accounted for $16.3 million, or 36 percent; and
- Sales, fees, and earnings accounted for $6.3 million, or 14 percent.

Of the $16.3 million collected in taxes, $15.7 million was collected as property tax. While property taxes (**Table 3-6**) are low in Montana compared with other mountain west states, they are not low for individual owners and commercial establishments, and they are rising faster than per capita incomes.

Table 3-6.
Taxable Values, Ravalli County

	1987	1994	2000
Residential	57.8%	63.9%	69.5%
Commercial	9.5%	11.1%	13.4%
Subtotal	67.3%	75%	82.9%
Taxable Values	$28,400,000	$40,700,000	$49,000,000

Source: Nicholson 2002.

The Montana Legislature lowered rates on utilities and business equipment, placing almost 83 percent of the tax burden in Ravalli County on residential and commercial property owners. Assessed property values almost doubled, and property tax bills more than doubled, as special districts such as fire departments and schools raised their mill levy requests in an attempt to maintain cuts from the state share of taxes. Local wages, which pay these taxes, have not increased at the same pace.

3.4 NOISE

There are no local, state, or federal noise ordinances in effect for the area. However, RML has drafted guidelines to limit noise levels due to its operations (**Table 3-7**).

A noise level study of the current operation was conducted in May 2003 (Big Sky Acoustics 2003). Measurements were conducted at 13 locations (**Figure 3-1**). Measurements were taken with equipment operating, including the emergency generator, boiler steam vent, and/or the incinerator. Information concerning testing methods is available in the Final Noise Analysis Report in the administrative record.

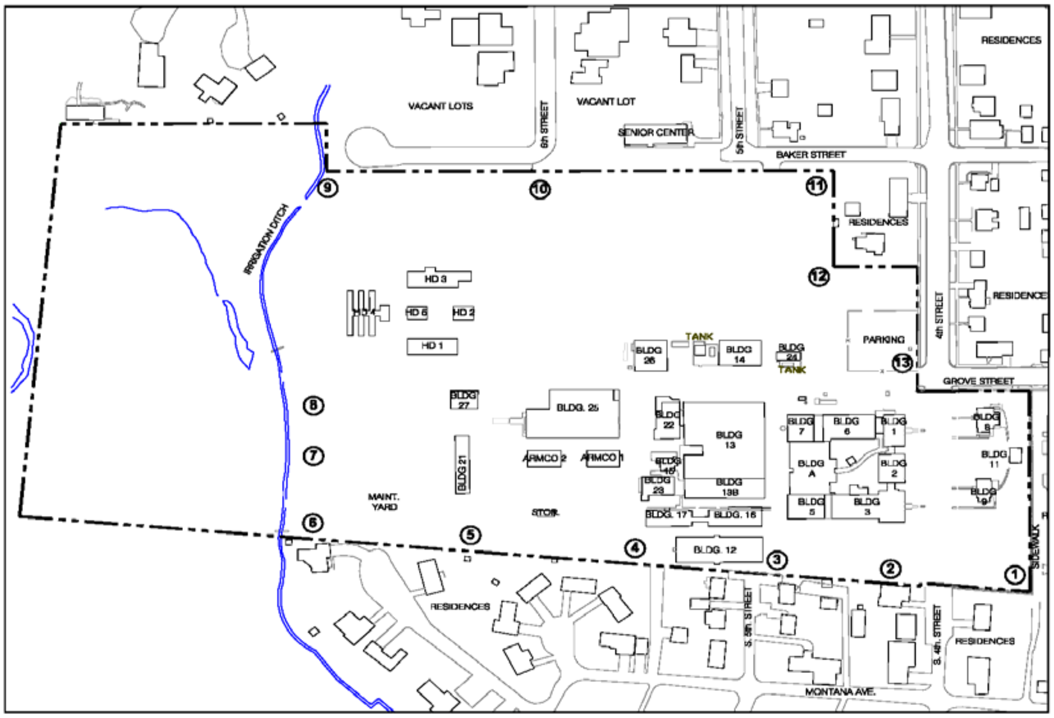


Figure 3-1. Ambient Noise Levels for Table 3-8.

Table 3-7. RML Campus Noise Guidelines

Noise	Daytime[1]	Nighttime[1]
Cumulative	55 dBA	50 dBA
Tonal[2]	50 dBA	45 dBA
Emergency Generator[3]	60 dBA	NA

1. Daytime 7:00 am to 7:00 pm, nighttime 7:00 pm to 7:00 am
2. Audible discreet tones shall be identified when the noise level in one-third octave-band frequency exceeds the arithmetic average of the levels in the two adjacent one-third octave band frequencies by 15 dB or more at frequencies below 125 Hertz, by 8 dB or more between 160 and 400 Hertz, and by 5 dB or more at frequencies equal to or greater than 500 Hertz.
3. During weekly testing of emergency generators, noise shall not exceed 55 dBA, and the combination of the generator and other campus equipment noise shall not exceed 60 dBA. Emergency generators will only be tested during daytime hours.

Table 3-8. Existing Ambient Noise

Location[1]	Daytime	Nighttime
1	48	45*
2	52	50*
3	52	51
4	51	50*
5	50	45*
6	44	40*
7	41	40*
8	44	40*
9	43	39
10	50	44
11	46	45
12	47	45*
13	49	45*

1 See Figure 3-1 for locations.
* Nighttime ambient levels that were estimated.

The study results indicated that existing ambient noise levels at the property line ranged between 41 and 52 dBA during the daytime and between 39 and 51 dBA at night (**Table 3-8**), which is considered faint to moderately loud (**Table 3-9**). Since the study was completed, noise reduction features have been installed, including putting a silencer on the incinerator stack, enclosing the incinerator cooling tower, muffling the steam plant, and muffling the generator buildings. These actions have reduced the noise emitted from the RML campus.

Table 3-9. Perception of Noise

Noise Level (dBA)	Noise Source	Subjective Evaluation
70	Vacuum cleaner 10 feet away or outdoors in a commercial area	Loud
60	Normal speech 3 feet away	Moderate
50	Typical office activities or background noise in a conference room	Moderate
40	Library background noise, quiet suburban environment at night, or typical background noise in a residence	Faint
30	Whisper 3 feet away or quiet rural environment at night	Faint
21	Concert hall background noise	Very faint
10	Human breathing	Very faint
0	Threshold of hearing or audibility	

Sources: Big Sky Acoustics 2002.

3.5 VISUAL QUALITY

The objectives of the visual resources investigation are to identify and describe visual resources that could be affected by the proposed expansion and related facilities. A viewpoint was selected for evaluating the visual characteristics presented in Chapter 4, Visual Quality. Factors considered in selecting the viewpoint included angle of observation, number of viewers, duration of view, relative apparent size of project, and lighting conditions. Viewpoint 1 was selected to represent a location from which a person may be expected to view the proposed Project features in the most direct manner. One viewpoint was established for the Proposed Action.

Viewpoint 1 is located at the intersection of Fifth and Baker streets and faces in a southwesterly direction (**Figure 2-1**). Viewpoint 1 is at the same elevation as the proposed Integrated Research Facility building. From this aspect, the existing landscape presents a flat valley floor with mountains rising in the background (**Figure 3-2**). The site as seen through the existing chain link fence is vegetated with scrub grasses and weeds. Dirt and gravel roadways and areas of deteriorating asphalt are also evident. Many buildings in this view are for storage and maintenance purposes. A variety of outside clutter and covered storage is visible. The buildings offer combination colors of reddish brick and gray metal. The upper portion of Building 25 blends with the dark tree-covered mountains in the background. Vertical stacks contrast sharply with the rectangular shapes of the structures.

3.6 HISTORICAL RESOURCES

The Rocky Mountain Laboratories Historic District, 24RA373 (**Figure 2-1**) was listed on the National Register of Historic Places (NRHP) in 1987. The district is eligible for the National Register for its significant architecture and historic role in scientific research (NRHP 1987). The Historic District consists of 10 structures.

Buildings 1 and 2 (**Figure 3-3)** were constructed in 1932-34 and are three-story Collegiate Gothic structures designed in a tripartite scheme, with a brick base below the first floor window sills. The buildings are of common bond, multi-colored, striated brick construction, which starts at the sill level of the first floor windows and terminates at the head of the third floor windows. Above the concrete belt course is a crenelated brick parapet with a cast concrete cap. The second and third story windows have cast concrete sills. The main entry vestibules are brick with corner quoining, terminated on the top and at each corner by a square block and ball motif cast in concrete.

Building 3 (**Figure 3-4**), constructed in 1938, is a three-story Collegiate Gothic structure. The details of Building 3 are the same as Buildings 1 and 2.

Building 4, constructed in 1936-37, was removed and replaced with Building A (**Figure 3-5**) in 1998. Building A has many of the same details as Buildings 1, 2, and 3.

Figure 3-2. Visual Quality, Existing Conditions

Figure 3-3. Overview, Building 1, facing southwest

Figure 3-4. Building 3, facing west

Figure 3-5. Building A, facing south

Figure 3-6. Buildings 5, A, and 7, facing north

Figure 3-7. Building 9, facing southeast

Buildings 5 (**Figure 3-6**) and 6, constructed in 1938 and placed into service in 1940, are both two-story Moderne style structures. These simple, rectangular masonry buildings have regularly spaced windows set singly or in pairs.

Building 7, the former heating plant, was constructed in 1938-40 and is a Moderne style structure. This three-story structure has similar details as Buildings 5 and 6 and has a tall, round masonry smoke stack on the west side.

Buildings 8 and 9 (**Figure 3-7**) are two Late Colonial Revival style residences located across 4th Street from the laboratories.

Building 8, constructed in 1936-37, is a two-story, rectangular, wood-frame structure resting on a concrete foundation with shed dormers on the second floor. The gable roof, which runs parallel to 4th Street, has a 10/12 pitch and slight eave returns. Beneath the eaves is a molded fascia that provides a lateral six-inch overhang. The lap siding has seven-inch reveal, the first floor windows are 8-over-12 wooden double hung units. The dormer windows are 8-over-8 double hung windows. The doorway is approached by four risers and is covered with an enclosed, bow-roofed portico.

Building 9, constructed in 1937, is a two-story wood frame residence set on a concrete foundation with a shed dormer on the second floor. The building is symmetrically organized with a central entry flanked by two small projecting bay windows set beneath the flared overhang of the gambrel roof. The bay windows are 8/12 on the first floor and 4/6 on each angle. The entry is marked by a gable-roofed, arched overdoor that is cut into the eave overhang and accessed by a three-riser concrete stair. Building 11 is located behind and between Buildings 8 and 9, was constructed in 1937.

The primary laboratory buildings, the power plant, and the two residences possess architectural significance in the context of the type and quality of construction. The cohesive facades, massing, and detailing of the understated Collegiate Gothic buildings creates a strong visual impression. The pair of Colonial Revival style residences located across the street from the laboratories exhibit higher than average design sophistication, craftsmanship, and use of materials. Attention to landscaping and setbacks affords a sense of continuity with the residential character of the surrounding neighborhood.

Section 106 of the National Historic Preservation Act of 1966 (as amended) requires federal agencies to consider the effects of their actions on historic properties. The procedure for meeting Section 106 requirements is defined in regulations of the Advisory Council on Historic Preservation, Protection of Historic Properties (the Code of Federal Regulations, hereafter cited as 36CFR Part 800 with subparts). The Montana State Historic Preservation Office (SHPO) provided comments on the proposed research facility. The concerns noted by SHPO centered on the potential for "an adverse effect visually, at the least" on the historic district. The SHPO comments also noted that the proposed building should be compatible with the original structures in materials, that the proposed building should be set back so as to not block a major elevation of the original structure, and that it should also be in keeping with the scale of the historic district (Dawson 2002).

3.7 AIR QUALITY

The study area for air resources consists of the area within 30 miles of the RML site. The site experiences a cool climate typical of intermountain valleys of the Rocky Mountain area.

Meteorology

Climate in the study area is influenced by major topographic features, including the Bitterroot Mountain Range to the west and the Sapphire Mountains to the east. Mountain ranges in the Bitterroot Valley trend generally north and south and affect local wind, precipitation, and temperature patterns.

Typical precipitation levels are one inch or less of precipitation per month, and temperatures range from warm to hot during the summer months. Winters are cool to cold. The average daily temperature ranges from 36° F in January to 83° F in July in Hamilton.

Wind speed and direction data for the Project area obtained from the National Oceanic and Atmospheric Administration (NOAA) show varying speeds and direction. Based on data at Corvallis and Hamilton, typical maximum wind is primarily to the southeast/south-southwest.

Due to the City of Hamilton's physical location (e.g., proximity to mountains), meteorological conditions are conducive to atmospheric inversions. These inversions can occur throughout the year; however, they are most prevalent from October through March. When wind speed and mixing heights are low, inversions can occur, restricting emission mixing and dispersion.

The fall and winter climates in the area are cool to cold with few extended cold spells. Most precipitation during this period is in the form of snow, which accumulates in the valleys and on surrounding ridges. Precipitation during the spring usually occurs during May and June. The western portion of the valley receives more precipitation than the eastern portion, which is a function of the proximity to the Bitterroot Mountains. Summer precipitation is often associated with thunderstorms. Precipitation in the Valley area ranges from 12 to 16 inches annually along the Highway 93 corridor from Corvallis to Sula. Mean annual precipitation is about 14 inches in Hamilton, with 16 inches to 48 inches on the surrounding upland areas.

Air Quality

The State of Montana and the federal government have established ambient air quality standards for criteria air pollutants. The criteria pollutants are carbon monoxide (CO), lead (Pb), sulfur dioxide (SO_2), particulate matter smaller than 10 microns (PM_{10}), ozone, and nitrogen dioxide (NO_2). In 1997, the U.S. EPA revised the federal primary and secondary particulate matter standards by establishing annual and 24-hour standards for particles smaller than 2.5 microns diameter ($PM_{2.5}$). **Table 3-10** lists federal and state standards.

Ambient air quality standards must not be exceeded in areas where the general public has access. National primary standards are levels of air quality necessary to protect public health. National secondary standards are levels necessary to protect public welfare from known or anticipated adverse effects of a regulated air pollutant.

The attainment status for pollutants within the Project area is determined by monitoring levels of criteria pollutants for which National Ambient Air Quality Standards (NAAQS) and Montana Ambient Air Quality Standards exist. Air quality in the Hamilton and Ravalli County area is designated as attainment or unclassified for all criteria pollutants. This designation means that based on monitored and assumed air pollutant levels, there are no exceedances of air quality standards in the area.

Air emission modeling conducted at RML, which is discussed in more detail later, was performed using meteorological data from a number of sites, including data from Missoula, an area also subject

Table 3-10.
State of Montana and National Ambient Air Quality Standards

Pollutant	Averaging Time	Air Quality Standard Concentration (a)	
		Montana	National
Ozone	1 hour	195 μg/m³ (0.12 ppm)	235 μg/m³ (0.12 ppm)
	8 hours	None	157 μg/m³ (0.08 ppm)
Carbon Monoxide	1 hour	25,560 μg/m³ (23 ppm)	40,000 μg/m³ (35 ppm)
	8 hour	10,000 μg/m³ (9.0 ppm)	10,000 μg/m³ (9.0 ppm)
Nitrogen Oxides	Annual Arithmetic Mean	100 μg/m³ (0.05 ppm)	100 μg/m³ (0.05 ppm)
Sulfur Dioxide	Annual Arithmetic Mean	52 μg/m³ (0.02 ppm)	80 μg/m³ (0.03 ppm)
	24 hours	261 μg/m³ (0.10 ppm)	365 μg/m³ (0.14 ppm)
	3 hours	NA	1,300 μg/m³ (0.50 ppm) (b)
	1 hour	1,300 μg/m³ (0.50 ppm)	NA
Particulate Matter as PM_{10}	Annual Arithmetic Mean	50 μg/m³	50 μg/m³
	24 hours	150 μg/m³	150 μg/m³
Particulate Matter as $PM_{2.5}$	Annual Arithmetic Mean	15 μg/m³	15 μg/m³
	24 hours	65 μg/m³	65 μg/m³
Lead (Pb)	Quarterly Arithmetic Mean	1.5 μg/m³	1.5 μg/m³

Note: μg/m³ = micrograms per cubic meter; ppm = parts per million; PM_{10} = particulate matter smaller than 10 microns; $PM_{2.5}$ = particulate matter smaller than 2.5 microns.

Sources: Administrative Rules of Montana (ARM) 17.8 and Code of Federal Regulations, 40 CFR Part 50, National Primary and Secondary Ambient Air Quality Standards.

(a) Primary standard unless otherwise noted.

(b) Secondary standard.

to atmospheric inversions.

Modeling was completed in response to an air quality permit modification by RML to incorporate the addition of two new boilers in 1999. Results of air modeling, which included operation of the existing incinerator, predicted that emission rates from RML resulted in an ambient air quality impact of seven to 22 percent (Doucet and Mainka 1999) of the federal and Montana primary standards, designed to protect human health.

Particulate Emissions

Sources of air contaminant particulate emissions at the RML campus include incinerators, steam-generating boilers, emergency power generators, and laboratory vent hoods. Medical waste and general refuse is disposed of in the natural gas-fired incinerators. Off-gas emissions are processed through a wet scrubber to remove particulate and hydrogen chloride from combustion gases before discharge through a vertical stack to the atmosphere. The incinerators have automation systems that monitor the waste material feed rate and essential operating parameters. The boilers are fired by natural gas with diesel as a secondary fuel supply. Boiler combustion gases exit through vertical discharge stacks. Diesel-fired emergency power generator emissions primarily result from testing the units weekly. Units run for short periods to test system function. Air from the current BSL-3 laboratories is discharged through HEPA filters.

Gaseous Emissions

Gaseous emissions from RML include sulfur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), and particulate matter (PM) from incinerators, steam-generating boilers, emergency power generators, and laboratory vent hoods. Gaseous emissions result from waste and fuel combustion, filling and dispensing fuel from above-ground fuel tanks, and from vent hoods (operations within the laboratories).

Air Quality Monitoring Data

Ambient air quality data have been collected at monitoring stations in Hamilton and at U.S. Forest Service ranger stations at Stevensville and West Fork (**Table 3-11**). All three stations are within Ravalli County. PM_{10} data have been collected at all three sites and $PM_{2.5}$ data at one of the sites. None of the three stations reported any violations of ambient standards during the period of record.

Table 3-11.
Monitoring Data – PM_{10} and $PM_{2.5}$

Site	Year	Annual Geometric Mean (μg/m³)	24-Hour High (μg/m³)	24-Hour 2nd High (μg/m³)
#0001 Ravalli County Courthouse Hamilton	1994	22.8	88	73
	1995	19.1	67	63
	1996	17.7	59	55
	1997	20.1	35	55
	1998	---	---	---
	1999	13.9	38	37
	2000	17.8	66	60
#0002 111 S. Hwy 93 Hamilton	1994	31.9	92	81
	1995	26.1	78	74
	1996	26.2	96	69
	1997	25.6	61	53
	1998	23.1	98	57
	1999	21.6	77	67
#0003 Stevensville Ranger Station	1994	23.3	60	52
	1995	20.7	61	47
	1996	21.0	56	54
	1997	23.6	54	47
	1998	22.3	96	75
	1999	18.6	47	44
	2000	16.0	33	31
#0004 W. Fork Ranger Station	1994	8.6	54	50
	1995	6.4	58	50
	1996	9.3	48	47
	1997	7.9	93	67
	1998	9.3	---	---
	1999	6.3	48	41
	2000	6.7	93	51
$PM_{2.5}$ Data				
#0001 Ravalli County Courthouse Hamilton	2000	8.01	62.7	55.7

Note: PM_{10} = particulate matter < 10 microns; $PM_{2.5}$ = particulate matter < 2.5 microns; μg/m³ = micrograms per cubic meter.

Source: USEPA 2001.

Existing Sources

Twelve known permitted or pending air emission sources occur in Ravalli County. Of them, four are fixed location sources, while the remainders are portable. The fixed location sources in Hamilton are RML, a crematorium, a biomedical manufacturing facility, and a surgical device manufacturing facility in Victor. The portable sources are gravel crushers, associated processing equipment, and asphalt plants.

Existing, permitted, industrial emission sources located within Ravalli County include: Rocky Mountain Laboratories, Bitterroot Pet Crematorium, SSP Inc., Corixa Corp., Ravalli County Road Department, Bitterroot Rock Production, Donaldson Brothers, Stewart Excavating, Gasvoda Construction, John Schlect Excavation, RBC Enterprises, and Blahnik Construction. The facilities can emit combustion products including CO, NOx, SO_2, and hydrocarbons from boilers, pathological furnaces, engines, kilns, and other processes. Other potential fugitive dust and smoke sources include farming, field and forest burning, and dust from gravel roads.

Air Quality Permit

Industrial air quality permitting is part of the Montana State Implementation Plan process. The Montana Department of Environmental Quality uses air quality permit conditions to help ensure compliance with applicable Montana and National Ambient Air Quality Standards and Prevention of Significant Deterioration increments.

Primary emitting sources at RML include the boilers for process and facility steam and the incinerators for refuse disposal. The boilers are subject to 40 CFR Part 60, Subpart Dc, Standards of Performance for Small Industrial-Commercial Steam Generating Units. The incinerators are subject to 40 CFR Part 60, Subpart Ce, Standards of Performance for Hospital/Medical/Infectious Waste Incinerators. The New Source Performance Standards for particulate matter, including visual emissions (opacity), are included in regulations for both the boiler plant and incinerators.

Potential emissions from RML were analyzed in 1999 using the EPA's Industrial Source Complex Short Term (ISCST3) air model. In the analysis (Doucet and Mainka 1999), emissions from RML were used to predict their effect on ambient air quality. Meteorological data used in the emission modeling for RML included 10 years of data from Missoula and Kalispell, Montana (Douchet and Mainka). The ISCST3 model uses source data (emissions), terrain information, and meteorological information to predict emission concentrations at distance. Results of the modeling, using meteorological data from several locations, including Missoula, Montana, a site that experiences atmospheric inversions, predicted that RML source emissions would not result in a total facility impact above Montana and federal air quality standards.

RML is currently operating under Montana Air Quality Permit to Construct No. 2991-04. Through the permit, MDEQ has set conditions that ensure provisions of ARM Title 17.8 are met (Administrative Rules for Montana, Control of Air Pollution in Montana). The current permit reflects the planned additions of another boiler, emergency power generating equipment, an above-ground fuel storage tank for the emergency generators, and laboratory fume hoods for the proposed laboratory.

Incinerator emission testing is completed annually in accordance with the Montana Source Test Protocol and Procedures Manual. Source testing for priority pollutants, (NOx, SO_2, CO_2, and PM_{10}) and other constituents (e.g., dioxins and furans), show that emissions are within MDEQ air permit limits. In addition, six operating parameters are monitored to maintain compliance with emission limits established by the air quality permit.

Source test results at RML for dioxin and furans (potential by-products resulting from incomplete combustion of plastics) show concentrations up to 0.0000000000024 grams per cubic meter of air. Based on 2003 source test results, facility dioxin/furan emissions are approximately 1/1000th of the MDEQ air permit limit of 0.0000000023 grams per cubic meter.

PSD Classification

The area surrounding the RML site is designated a Class II area, as defined by the Federal Prevention of Significant Deterioration (PSD) Air Quality program. The PSD Class II designation allows for moderate growth or degradation of air quality within certain limits above baseline air quality. Industrial emission sources proposing construction or modifications must demonstrate that proposed emissions would not exceed ambient air quality standards. Emission modeling and subsequent regulatory analysis (MDEQ 2003) demonstrate that emissions from the RML facility comply with air quality standards.

The nearest Class I area is the Selway Bitterroot Wilderness, approximately six miles west of RML.

3.8 WATER SUPPLY AND WASTEWATER

Hamilton Water Supply

The City of Hamilton's public drinking water supply is currently supplied by four municipal wells in the Hamilton area. The City of Hamilton Department of Public Works (CHDPW) owns a fifth well that is currently not operating.

The four wells currently in use have a combined maximum capacity of 2,350 gpm (CHDPW 2002). The system produced a total of 618 million gallons in 2002(CHPWD data). Of this total, the CHDPW sold 260 million gallons. The difference between the volume produced and the volume sold (60%) is attributed primarily to water lost to leaks in the system. **Figure 3-8** is a graph showing the estimated quantity of water produced in 2002 compared to the quantity lost from the system on a monthly basis.

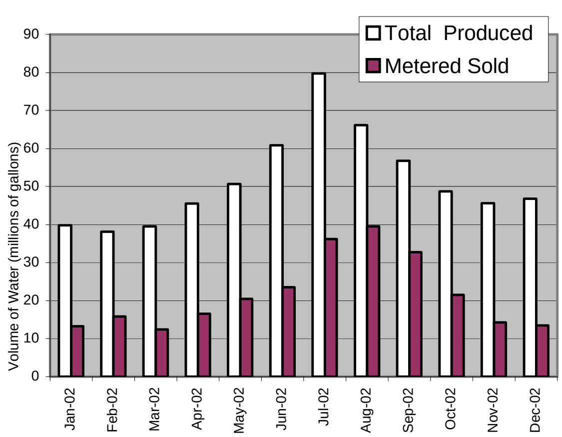


Figure 3-8.
Comparison of Volume of Water Produced to Metered Water Sold by CHDPW in 2002

CHDPW has an on-going program to identify and repair leaks. Between September 2001 and September 2002, a total of 16 leaks in the system were identified and repaired: three water main leaks, two water main gate valve leaks, three fire hydrant leaks, and five curb-stop valve leaks. Four additional leaks were identified on private service lines scheduled for repair in 2003.

The CHDPW municipal water supply system currently includes a 500,000-gallon steel storage tank and a pump station comprised of a pressure pump station using five pumps. This station provides supplemental pressure for subdivisions located on the bench southeast of Hamilton. An upcoming water improvement project includes installation of a new 1,500,000-gallon storage tank, a baffled contact basin, and an additional pressure pump station (Lowry 2003b). Long range plans include development of an additional well field to supplement water supplies and serve as a backup for the wells being installed in 2003 (Lowry 2003a).

The water system currently has an emergency backup generator capable of supplying 650 gallons per minute (gpm) that can be connected to a single well in the event of a power outage. A fixed power plant is planned by June 2004 at the new pump station. The power plant will supply three new wells capable of producing 2,500 gpm during power outages. The existing portable backup generator will still be available to produce an additional 650 gpm if needed (Lowry 2003b).

City of Hamilton policy currently allows for restricting irrigation to alternating odd and even day schedules in the event of extreme water demand.

Water used at RML is supplied by the CHDPW through a metered 10-inch water main. The average monthly water consumption at RML during 1995 and 1996 was approximately 2.277 million gallons per month (Stewart 2003). Hemisphere (2003) estimates the current average monthly water consumption at 1.7 million gallons. Five irrigation wells are located on the RML campus; water from these wells is not used for drinking or industrial purposes.

Under Hamilton Municipal Code 161, revision to Title 13 of the city water regulations, installation of new private potable water supply wells is prohibited if a residence is within 200 feet of a public water supply main. Additionally, installation of any private potable water supply well within city limits requires approval from the city council and city water department.

Groundwater

The regional direction of groundwater flow in the Bitterroot Valley is from the mountains along the basin margins toward the center of the basin and diagonally down valley (Briar and Dutton 2000). Groundwater in the Bitterroot Valley generally flows toward the Bitterroot River from the valley margins and parallel to the river in the flood plain. A groundwater investigation completed at the site in 2002 (Maxim 2003) identified that groundwater flow beneath the site is to the northwest. This is generally consistent with other studies of groundwater flow in the Bitterroot Valley (McMurtrey *et al.* 1972, Briar and Dutton 2000, Uthman 1988).

Western Groundwater Services (2000) completed a Source Water Protection Plan for the City of Hamilton in 2000. The Source Water Protection Plan for the City of Hamilton indicates that the water table in the portion of the aquifer supplying municipal wells slopes to the northwest, with a direction of flow approximately 20 to 30 degrees west of true north. The hydraulic gradient was approximated at one percent. The plan delineated the recharge zone for the municipal wells that are currently used for water supply (**Figure 3-9**). According to this analysis, the width of the aquifer contributing to the municipal wells in Hamilton is approximately 8,000 feet.

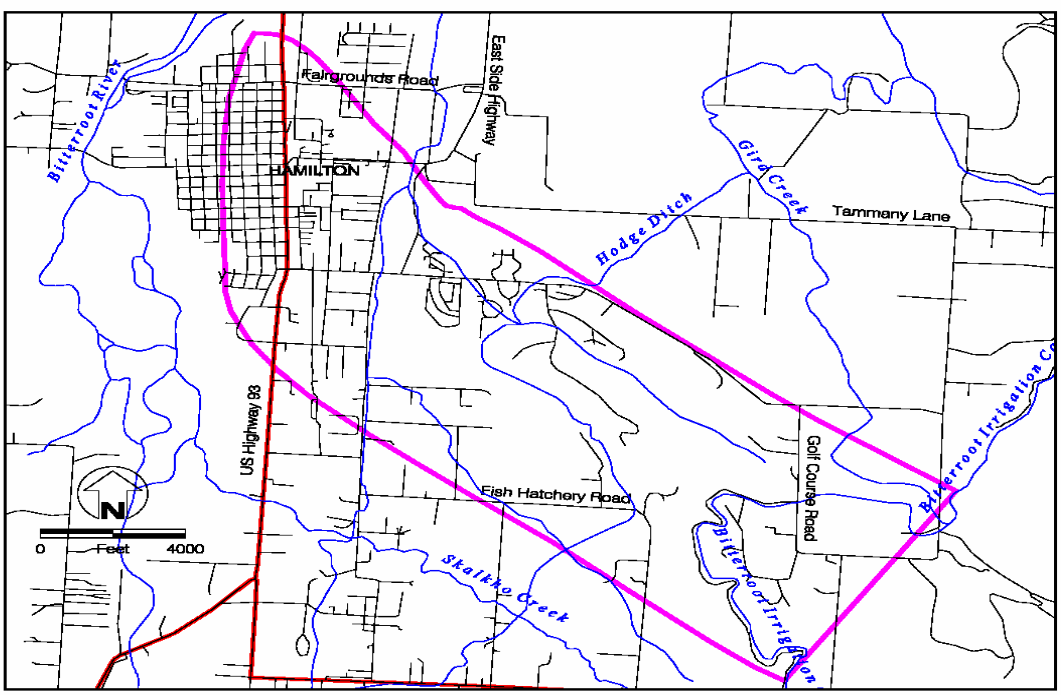
To determine the availability of groundwater, a conservative approach was used to estimate the daily flux (flow rate) of water in the shallow alluvial aquifer that is the current source of water, using Darcy's Law:

$$Q = K \times i \times ST \times W$$

Where:

Q = Flow rate
K = Hydraulic conductivity
i = Hydraulic gradient
ST = Aquifer saturated thickness
W = Aquifer Width

Figure 3-9. Hamilton Recharge Area



Source: Western Groundwater Services, 2000

Recharge Area for Existing Hamilton Wells

The following conservative input values were used for this calculation:

K = 214 feet/day

i = 0.01 (dimensionless)

ST = 49.4 feet

W = 8,000 feet

The flux or daily flow in the portion of shallow aquifer currently supplying water to municipal wells is estimated at 845,728 $feet^3$ per day. As a comparison, in 2002, CHDPW sold an average of 91,869 $feet^3$ per day, consuming about 10.9 percent of the available groundwater in 2002.

Wastewater Treatment

Currently, wastewater generated at RML is discharged to the sanitary sewer system operated by the CHDPW. Current sources of wastewater at RML include sanitary waste, liquid waste from animal facilities, boiler water, and cooling water. Wastewater discharges from RML to the CHDPW sanitary sewer via three sewer mains.

Wastewater from the following sources is treated before discharge to the sanitary sewer:

- Wastewater from cage-wash facilities in Building 13. Temperature and pH of this wastewater are measured in the holding tank before discharge to the sanitary sewer.
- Blowdown water from Building 23 incinerator scrubber. The pH and temperature of this wastewater are monitored in a settling tank before it is discharged to the sanitary sewer.
- Building 26 boiler blowdown. Temperature of this wastewater is monitored before discharge.
- Water from the cooling tower and incinerator scrubber cooling tower. Hardness and pH of this wastewater are monitored before discharge.
- Excess water from dust suppression during removal of incinerator ash. This wastewater is discharged to a settling tank before discharge to the sewer.

The CHDPW is required to conduct static replacement toxicity tests on effluent from its water treatment facility. CHDPW collects the samples and an independent laboratory conducts the tests. Marine organisms (*Ceriodaphnia sp.* or *Pimephales promelas*) are placed in samples of the treatment plant effluent and mortality is recorded over two to four days. Acute toxicity occurs when 50 percent or more mortality is observed for either species at any effluent concentration. Effluent samples from RML have not failed a test since testing began in 1996. Hemisphere (2003) estimates that RML's current wastewater effluent rate is 15,000 gallons per day.

The CHDPW wastewater treatment plant is an oxidation ditch-activated sludge facility. CHDPW upgraded the facility in 1997, adding a third clarifier and an automated sludge return and waste system resulting in the following designed operating capacities at the plant (CHDPW 2002):

- Average daily summer flow – 1.98 million gallons per day (MGD)
- Peak daily summer flow – 2.8 MGD
- Average daily winter flow – 0.5 MGD
- Peak winter flow – 1.1 MGD

As of April 2003, the wastewater treatment plant was operating within its design capacity (Lowry 2003a). Between July 2001 and July 2002, 220.81 million gallons of wastewater were treated at the plant at an average rate of 0.605 MGD (CHDPW 2002). The peak flow of 1.59 MGD occurred on July 1, 2001. From July 2001 to July 2002, the plant operated within its MDEQ discharge permit, and sampling and analysis required by the permit showed no exceedances of standards.

Solids removed from the effluent stream are collected as sludge and stored. The sludge is then composted during warm-weather months. The compost is made available for land application but is not allowed for use on vegetable gardens.

According to Dan Harmon of HDR Engineering, CHDPW's wastewater engineer (Personal communication October 7, 2003), the CHDPW produced an average of 1,000 to 1,200 lbs per day of waste solids.

The current seasonal nature of the composting operation requires that solids be stockpiled through the winter for composting in the spring. Available storage space and seasonal composting capacity are currently limiting the ability of the plant to handle more than minimal increases in annual solid load.

To accommodate increasing solids storage and handling requirements, the CHDPW is planning to construct a temporary solids storage basin to meet current requirements in the interim until a facility expansion plan is prepared (personal communication, Dan Harmon of HDR Engineering, October 3, 2003). The CHDPW plan may include implementing a year-round composting operation to upgrade solid handling capabilities (Lowry 2002).

3.9 RESOURCES NOT AFFECTED

3.9.1 Soil

3.9.1.1 Existing Condition

Native soil is mixed with fill material within the RML facility. Most soil within the RML campus is mapped as the Dominic cobbly sandy loam, which is a deep, well drained soil formed in alluvium (Bourne 1959). On-site native soil consists of 16 to 30 inches of pale brown (dry) to brown (moist) loose sand, gravel, and cobbles that is non-calcareous except for a thin carbonate coating on some cobbles. Soil in the south and east portion of the RML campus is mapped as Grantsdale loam. The Grantsdale series is a deep, well drained, moderately thick, grayish-brown surface soil underlain by moderately thick friable loam subsoil and brownish-gray, highly calcareous loam substrata. On-site fill material consists of poorly graded gravel and sand with scattered debris and pipe fragments (Huntingdon 1995).

A geotechnical investigation was completed (GMT 2002) to determine suitability of the soil at RML for construction and design standards for building footings. The Integrated Research Facility and other buildings included in the Project would be designed to meet these standards.

Several closed waste management units exist on the campus, including former seepage pits, septic tanks, and drainfields.

3.9.1.2 Rationale for No Further Discussion

Soil resources would not be affected by operations of the RML Integrated Research Facility. Construction activities would displace some soil in areas under and immediately adjacent to the proposed buildings. Weeds and grass grow in these areas. Former seepage pits, septic tanks, and filter trenches would not be impacted by construction of the Integrated Research Facility and other facility upgrades. Following construction, these areas would be reseeded and landscaped. No material generated by operation of the Integrated Research Facility would be released to soil. Therefore, soil resources would not be affected. No special measures were identified that would be required to prevent erosion during construction or operation of the facility.

3.9.2 Geology

3.9.2.1 Existing Condition

Geology

The Bitterroot Valley is a north-south trending intermontane basin about seven miles wide and 64 miles long, encompassing about 430 square miles. The Bitterroot Valley ranges from approximately 5,500 feet above sea level on its highest terraces to 3,250 feet at its termination at the Missoula Valley. It is bounded by the Bitterroot Mountains on the south and west, the Sapphire Mountains on the east, the Anaconda-Pintler Mountain range on the southeast, and the Missoula/Clark Fork Valley on the north (**Figure 1-1**). The Bitterroot Valley is characterized by two topographic features: a broad one- to two-mile wide floodplain in the center of the basin; and high, broad alluvial/colluvial terraces on the east and west flanks that are on average two to three miles wide. The terraces slope from 4° to 5° on the basin edges to less than 1° near the Bitterroot floodplain. West side terraces slope gently and merge with the floodplain and are bisected by small drainages. East side terraces have generally smooth topography, are flat topped, and relatively steep escarpments ranging 50 to 150 feet above the floodplain (Kendy and Tresch 1996).

Geologic Structure and Seismicity

The Bitterroot Valley is a structural basin formed during the emplacement of the Idaho Batholith in the late Cretaceous or early Tertiary Period resulting from basin floor dropping along pre-existing faults (McMurtrey *et al.* 1972) or as a result of eastward block displacement of crustal material along low-angle thrust faults (Hyndman *et al.* 1975). Geophysical data indicate that the western valley margin is relatively straight, but the eastern side has an irregular margin (Noble *et al.* 1982). The structural depth of the basin is one mile (Lankston 1975). Lower Tertiary age sediments within the basin have been deformed into a faulted syncline, whereas Pliocene sediments are relatively undisturbed (McMurtrey *et al.* 1972), indicating that the major tectonic events that formed the Bitterroot basin have slowed considerably since the end of the Tertiary period.

The basin is on the western edge of a broad region of basin and range tectonism. Extensional tectonism in the Bitterroot Valley, relatively dormant at present, occurs along existing fractures which are part of a regional northeast, northwest, and north-south trending fault system that exhibit long histories of recurrent activity (Barkman 1984).

At least six Class A faults or fault systems have been identified within 100 miles of the Hamilton area in western Montana (Haller *et al.* 2000). The closest Class A fault to Hamilton is the Bitterroot Fault, which runs along the east flank of the Bitterroot Mountains for a distance of approximately 60 miles and dips 45° to 90° east (Lindgren 1904, McMurtrey *et al.* 1972). The age of the faults extends from Cenozoic into late Quaternary time, with the most recent deformation occurring in pre-Bull Lake and Bull Lake glacial deposits, 300,000 to 130,000 years ago (Barkman 1984). The surface traces of the Bitterroot Fault system are shown by McMurtrey *et al.* (1972) as four traces that run along and into the Bitterroot Range from near Florence to south of Victor. Barkman (1984) identified several distinct fault scarps in the Bitterroot Valley that have been active in Quaternary time: the Bear Creek Scarp and the Curlew Fault located west of Victor, and the Tin Cup and Como scarps located north of Tin Cup Creek.

The most recent faulting appears to have occurred around 7,700 years ago on the Mission Valley section of the Mission Fault. Class A faults have evidence that at least one large-magnitude earthquake has occurred on that fault during the last two million years.

Within the last 40 years, two recordable earthquakes greater than 2.5 magnitude have occurred within 50 miles of Hamilton, Montana. In 1982, a 2.5 Richter magnitude tremor occurred approximately 20 miles southeast of Hamilton (Stickney *et al.* 2000), and on June 28, 2000, a 4.5 magnitude earthquake occurred approximately 40 miles northeast of Hamilton.

3.9.2.2 Rationale for No Further Discussion

The Bitterroot Valley has one of the lowest seismic activity ratings in western Montana (Stickney *et al.* 2000). The International Conference of Building Officials rates Hamilton as a low seismic risk area (Zone 0). By comparison, Salt Lake City is in Zone 2, and part of San Francisco is in Zone 4.

3.9.3 Floodplains

3.9.3.1 Existing Condition

The Bitterroot River watershed encompasses 2,842 square miles above its confluence with the Clark Fork River, of which 1,685 square miles are above Hamilton (Nolan 1973). The floodplain in the Hamilton area is relatively narrow and confined by older paleo-river terraces to the east and west. The proposed Integrated Research Facility and other facility upgrades would be located about 1,400 feet east of the Bitterroot River on low alluvial terrace deposits above the 100-year floodplain (**Figure 3-10**).

Executive Order 11988 requires that the Project be assessed to determine if activities would occur within a floodplain. The Project location is about 725 feet east of the 100-year floodplain at its closest approach. The elevation at the proposed Project location is about 18 feet above the 100-year floodplain base elevation (FEMA 1998).

3.9.3.2 Rationale for No Further Discussion

The proposed BSL-4 laboratory would not be located within the 100-year floodplain, and therefore requirements of EO 11988 do not apply. No additional analysis of impacts is required.

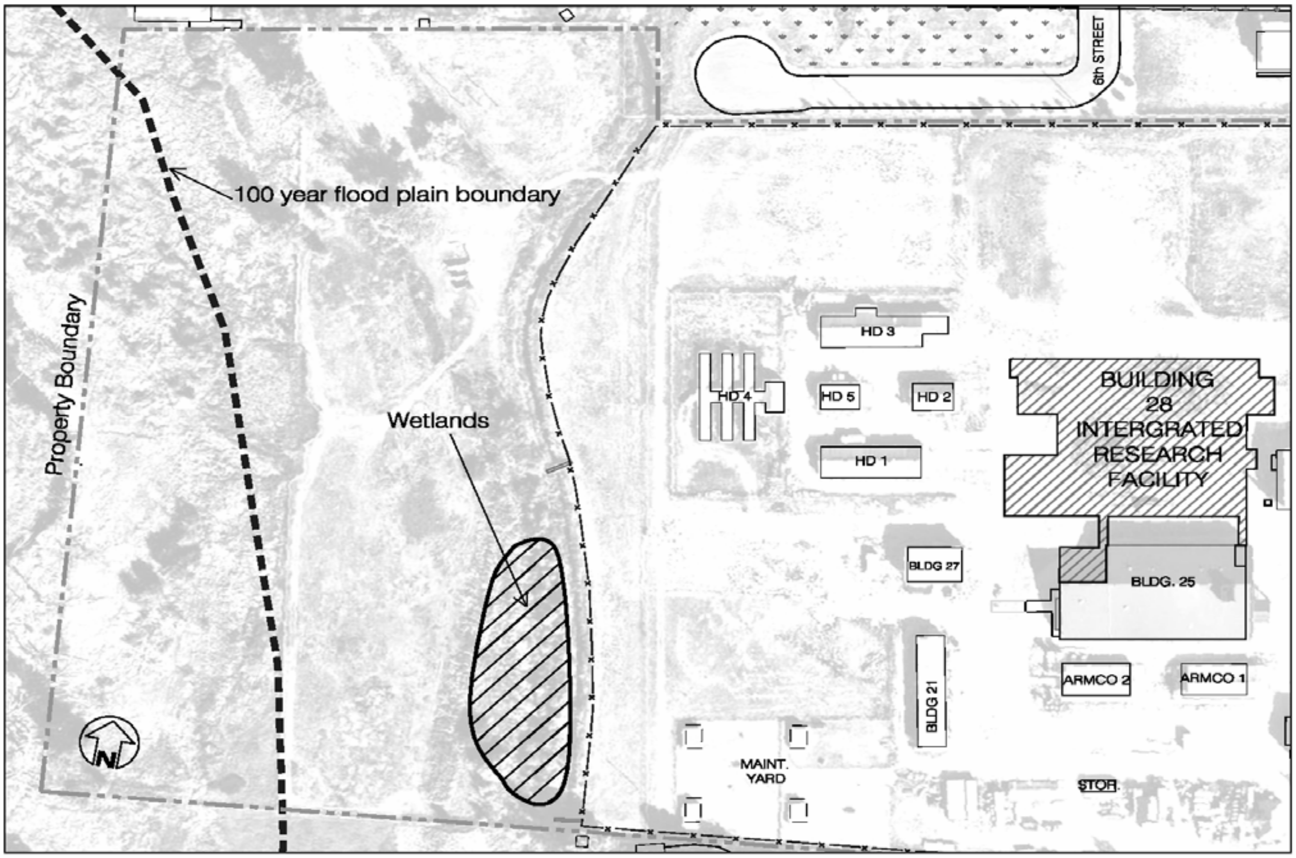


Figure 3-10. Mapped Wetlands and 100-Year Floodplain

3.9.4 Wetlands and Riparian Areas

USDHHS manual 30-40-00 (Natural Asset Review) defines wetlands as those areas inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation or aquatic life that require saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas.

Executive Order 11990, Protection of Wetlands, 42 FR 2691 (1977) as amended by Executive Order 12608, 52 F 34617 (1987), 42 U.S. Code 4321, directs each federal agency to minimize destruction, loss, or degradation of wetlands and to preserve and enhance such wetlands in carrying out their program responsibilities. Consideration must include a variety of factors such as water supply, erosion and flood prevention, maintenance of natural systems, and potential scientific benefits.

3.9.4.1 Existing Condition

The RML facility is located on a terrace above and east of the Bitterroot River floodplain. The National Wetlands Inventory map and air photos were consulted to identify riparian areas and wetlands near the RML campus. The area within the 100-year floodplain west of the RML campus is a riparian area containing wetlands. Mapped wetlands are shown in **Figure 3-10.** The closest wetland is approximately 430 feet west of the proposed Integrated Research Facility location.

3.9.4.2 Rationale for No Further Discussion

Riparian areas and wetlands would not be affected by the Proposed Action because no construction would occur in or near riparian areas or wetlands. No liquids or wastes would be discharged to wetlands during construction or operation of the Integrated Research Facility.

3.9.5 Vegetation

3.9.5.1 Existing Condition

Vegetation within the RML campus consists of lawn grasses and weeds.

3.9.5.2 Rationale for No Further Discussion

Vegetation would not be disturbed or affected outside the Integrated Research Facility construction area or by other Proposed Action activities.

3.9.6 Fish

3.9.6.1 Existing Condition

In the vicinity of Hamilton, the Bitterroot River provides habitat for approximately 12 species of coldwater fish (Holton 1990; MFWP 2002). Six salmonid species are classified as game fish in the Bitterroot River: bull trout, brook trout, brown trout, rainbow trout, westslope cutthroat trout, and mountain whitefish. Brook, brown, and rainbow trout are not native to the Bitterroot River. One fish species of concern (MNHP 2003a), the westslope cutthroat trout, is listed as common in the Bitterroot River in the vicinity of Hamilton (MFWP 2002). Bull trout, which are listed under the Endangered Species Act, are an incidental and rare resident fish species in the Bitterroot River (MFWP 2002) (see Section 3.9.8, Threatened and Endangered Species).

3.9.6.2 Rationale for No Further Discussion

Since the RML campus is located at least a quarter-mile from the Bitterroot River, and erosion control measures would be implemented at the RML campus during construction, there would be no impacts on fish species in the Bitterroot River or their habitat. Wastewater from the RML facility would enter the City of Hamilton's wastewater treatment facility. Discharges to the treatment facility from the Integrated Research Facility would not cause exceedances of permitted discharge limits for the wastewater treatment facility (see the Water Supply and Wastewater section on page 3-17). Therefore, no change in water quality of the Bitterroot River would result from operation of the Integrated Research Facility. Consequently, there would be no adverse impacts on fish species in the Bitterroot River as a result of facility construction or operation.

3.9.7 Wildlife

3.9.7.1 Existing Condition

The fauna of the valley near Hamilton is characteristic of the northern Rocky Mountains. Approximately 45 species of mammals, five species of amphibians, and nine species of reptiles may occur in the vicinity of Hamilton and RML (Foresman 2001; Maxell *et al.* 2003). Also, approximately 100 species of birds may breed in the valley near Hamilton (MTNHP 2003b). Wildlife habitat has generally been altered by agriculture and other human developments. Highly altered urban environments meet the habitat needs of fewer species, most of which tend to be generalists, and several of which are non-native (e.g., European starling, house mouse, eastern fox squirrel). Species inhabiting urban environments tend to be tolerant of disturbance.

Common species of mammals that may occur in or adjacent to Hamilton include white-tailed deer, mule deer, coyote, red fox, striped skunk, raccoon, badger, long-tailed weasel, deer mouse, house mouse, meadow vole, Columbian ground squirrel, yellow-bellied marmot, eastern fox squirrel, several species of bats (e.g., big brown bat), and shrews (e.g., masked shrew). Terrestrial garter snakes, common garter snakes, and gopher snakes may live in Hamilton. Common bird species likely to breed in the urban habitats of Hamilton include rock dove, mourning dove, great horned owl, downy woodpecker, hairy woodpecker, northern flicker, western wood-pewee, eastern kingbird, tree swallow, barn swallow, black-billed magpie, black-capped chickadee, house wren, American robin, European starling, warbling vireo, yellow warbler, western tanager, American tree sparrow, chipping sparrow, dark-eyed junco, brown-headed cowbird, house finch, American goldfinch, and house sparrow.

3.9.7.2 Rationale for No Further Discussion

The Proposed Action area provides little wildlife habitat, as vegetation consists of native and non-native grasses and weeds. Consequently, few species would find adequate breeding or foraging habitat at RML's campus. Birds nesting on buildings near the construction area may be temporarily displaced. Less mobile species of small mammals and reptiles could potentially be impacted directly. Any impacts would affect few individuals and not populations.

The Proposed Action would not affect wildlife because of the small area of disturbance and no loss of habitat.

3.9.8 Threatened and Endangered Species

3.9.8.1 Existing Condition

The U.S. Fish and Wildlife Service provided a current list (March 11, 2003) of endangered and threatened species potentially living in Ravalli County. No threatened or endangered plant species appeared on the list. The following threatened or endangered fish or animal species were listed:

- Bull Trout - Threatened
- Bald Eagle - Threatened
- Wolves - Endangered
- Lynx - Threatened
- Yellow-billed Cuckoo (western population) - Candidate

Bull Trout (Threatened)

The major population of bull trout in the Bitterroot drainage today are residential fish that tend to live in higher elevation streams. Migratory forms that live in the Bitterroot River are rare. The main stem of the Bitterroot River contains critical overwintering areas and migratory corridors. Historically, bull trout likely used the Bitterroot River and its tributaries. Currently, however, bull trout are rare in the main stem Bitterroot River from Blodgett Creek to the East Fork (Montana Bull Trout Scientific Group 1998).

Bald Eagle (Threatened)

Bald eagle nesting and roosting habitats include mature and over-mature mixed conifer, ponderosa pine, and cottonwood stands near large rivers or lakes. Bald eagles are common winter residents in the Bitterroot Valley and also pass through the area during migration. The nearest known bald eagle nest to Hamilton is located on the Teller Wildlife Refuge near Corvallis, approximately five miles from RML (Mullen 2002).

Gray Wolf (Endangered, 10(j) Population)

The Project Area is within the Central Idaho Non-essential, Experimental Population designated by U.S. Fish and Wildlife Service (1994). Wolves within this area are managed as a population proposed for listing rather than as a species listed under Section 10(j) of the Endangered Species Act (ESA). No packs are known near the area to be affected directly or indirectly by the action.

Lynx (Threatened)

Lynx often inhabit forested benches, plateaus, valleys, and gently rolling ridgetops in rugged mountain ranges (Koeler and Aubry 1994). Primary lynx habitat in the Rocky Mountains includes lodgepole pine, subalpine fir, and Englemann spruce. Lynx prefer to forage in areas that support their primary prey, the snowshoe hare. In the Bitterroot Mountains, lynx habitat has been identified at elevations of 6,200 feet and higher. Dry Douglas fir and ponderosa pine forest that occurs at lower elevation (such as around RML) is not considered lynx habitat.

Yellow-billed Cuckoo (Candidate)

The yellow-billed cuckoo is a rare transient in western Montana. It prefers areas of low, dense, shrubby vegetation in cottonwood and willow riparian corridors, open woodlands, brushy pastures, and along brushy roadsides (DeGraaf *et al.* 1991; Dobkin 1992). It selects well-concealed nest sites in shrubs or low trees, generally four to six feet above ground. Yellow-billed cuckoo have occasionally been reported (twice in 1988, once in 1997) in the Stevensville area (Montana Natural Heritage Program) but they are not known to occur near the Project area.

3.9.8.2 Rationale for No Further Discussion of Listed Species

There is no designated or proposed critical habitat present in the action area. The proposed laboratory expansion would not disturb areas beyond the existing campus area. Noise and dust created during construction on campus is not going to be loud, long-lasting or intense enough to affect individual animals. For these reasons, no effect on threatened or endangered species or their critical habitat would result from the Proposed Action. Water and air quality would be maintained, and areas outside of the construction area would not be disturbed.

3.9.9 Environmental Justice

U.S. Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations) directs federal agencies to assess whether the Proposed Action or alternatives would have disproportionately high and adverse human health or environmental impacts on minority and low-income populations. Identification of environmental issues can be accomplished through public involvement and the scoping process.

3.9.9.1 Existing Condition

The areas of potential effect for environmental justice are neighborhoods and populations adjacent to the Project area.

Five steps are used to determine environmental justice issues: (1) identify minority and low-income populations in the area affected by the Project; (2) consider relevant public health data and industry data regarding multiple and cumulative exposure of minority and low-income populations to human health or environmental hazards; (3) recognize interrelated cultural, social, occupational, historical, and economic factors that could amplify environmental effects of the Project; (4) develop effective public participation strategies that overcome linguistic, cultural, institutional, geographic, and other barriers; and (5) assure meaningful community representation.

Minority Population: For purposes of this assessment, "minority" refers to people who classified themselves in the 2000 U.S. Census as African Americans, Asian or Pacific Islanders, American Indians, Hispanics of any race or origin, or other non-White races. A "minority population" refers to an area where minority individuals comprise 25 percent or more of the population. In Ravalli County, persons of Hispanic or Latino origin account for 1.9 percent of the population, American Indian/Alaska Natives account for 1.8 percent of the population, native Hawaiian or pacific islanders account for 0.2 percent, Asians account for 0.3 percent, and Blacks account for 0.1 percent. White persons, not of Hispanic or Latino origin accounted for 96 percent of the County population in 2000 (U.S. Census Bureau 2002a).

Low-Income Populations: Low-income population refers to a community in which 25 percent or more of the population is characterized as living in poverty, as determined by statistical poverty thresholds used by the federal government. In 2000, the poverty weighted average threshold for a family of four was $17,603 and $8,794 for an unrelated individual (US Census Bureau 2001). In Ravalli County, 13.8 percent of the population is below the poverty threshold (US Census Bureau 2002b).

3.9.9.2 Rationale for No Further Discussion

The area of potential effect does not have minority or low-income populations that fulfill the first step, rendering the remaining steps irrelevant with respect to Environmental Justice.

3.9.10 Surface Water

3.9.10.1 Existing Condition

The Bitterroot River drains a basin of approximately 2,800 square miles (McMurtrey *et al.* 1972). Major tributaries entering the Bitterroot River near Hamilton include Sawtooth, Canyon, Skalkaho, and Gird creeks. The pattern of surface water flow is typical of mountain areas where spring runoff from snowmelt is often augmented by late spring or early summer rain. About 55 percent of runoff in the Bitterroot River occurs during May and June (McMurtrey *et al.* 1972). Permeable soil and extensive farming generally prevent surface runoff, except during storms of high intensity or during snowmelt while the ground is frozen. Portions of both tributaries flowing from the east to the Bitterroot River and the Bitterroot River itself in the vicinity of RML are diverted to canals and ditches during irrigation months of May through September (Western Groundwater Services 2000).

The only surface water body within ½-mile of the site is the Bitterroot River. The Bitterroot River is classified as a B-1 stream, suitable for drinking, culinary and food processing purposes after treatment, as well as swimming, bathing, recreation, and the growth and propagation of salmonids (MDEQ 2000). The MDEQ reported in the total maximum daily loads (TMDL) screening for the Bitterroot River and associated tributaries that the most probable sources of impairment for the river are pasture and range grazing in riparian areas, bank destabilization, agricultural and urban runoff, storm sewers, and general habitat modifications. The Bitterroot River from Skalkaho Creek to Eightmile Creek fully supports agricultural and industrial uses and it partially supports swimming and recreational activities, fisheries, and aquatic organisms (MDEQ 2000). The Bitterroot River is on the 303(d) list of impaired streams and has been given a high priority for development of TMDLs. Non-point source TMDLs have not been approved by MDEQ on the Bitterroot River, but an anti-degradation point source TMDL has been approved for lead, copper, and zinc.

3.9.10.2 Rationale for No Further Discussion

Construction of the Integrated Research Facility would not affect surface water resources. Surface water would not be used at the Integrated Research Facility, and wastewater discharged to the Hamilton wastewater treatment plant would not result in exceedances of permitted discharge from the plant. Because wastewater treatment standards would be met, there would be no impact on surface water.

3.9.11 Groundwater Quality

3.9.11.1 Existing Condition

Briar and Dutton (2002) sampled 239 wells in the Hamilton aquifer for nitrate and 43 wells for common ions, trace elements, and radon. The median nitrate concentration for samples from wells on the west side of the Bitterroot River was 0.17 milligrams per liter (mg/L), while the median for samples from wells on the east side was 1.05 mg/L (Briar and Dutton 2000). All samples had nitrate concentrations below the MDEQ WQB-7 human health standard of 10 mg/L. Most groundwater in the Hamilton area is a calcium bicarbonate type (Briar and Dutton 2000). One sample contained a cadmium concentration of 5 micrograms per liter (μg/L), equal to the MDEQ circular WQB-7 human health standard. No other concentrations exceeded human health-based groundwater quality standards. Concentrations of fluoride, iron, and manganese measured in groundwater samples from some wells exceeded circular WQB-7 drinking water standards for taste, odor, and color. Radon measured in 43 samples ranged from 150 to 3,700 picocuries per liter (pCi/L), with a median concentration of 765 pCi/L for 18 of the 43 samples collected in the Hamilton area. The five Hamilton municipal wells were sampled in 2001 and exhibited an average radon gas concentration of 1,350 pCi/L (Maxim 2003). There is currently no drinking water standard for radon. The EPA has proposed a maximum contaminant level (MCL) of 300 pCi/L and an alternative MCL of 1,200 pCi/L. The alternative MCL can only be used if an approved mixed-media mitigation program is adopted to educate water users with respect to radon exposure. The proposed standards are anticipated to become final in 2006-2007.

Between 1992 and 2003, several groundwater investigations were completed using site monitoring wells. The investigations included groundwater sampling and analysis (Envirocon 1993; Maxim 1998, 2001a, 2001b, 2003). Samples collected from RML monitoring wells have not exhibited concentrations of any parameters (volatile organic compounds, semivolatile organic compounds, dissolved metals, and radioactivity) exceeding Montana or federal water quality standards (e.g., USEPA MCLs or MDEQ Circular WQB-7 standards), with two exceptions: gross alpha radiation and dissolved lead.

Samples from facility monitoring wells have exceeded the U.S. EPA MCL and/or MDEQ Circular WQB-7 standards for gross alpha emissions on at least one occasion. There is no evidence from any groundwater investigation at RML that suggests radon, gross alpha, or gross beta are originating at RML. Alpha-emitting radionuclides have never been used during biological research at RML or stored at the facility. Alpha particles are produced during the radioactive decay of radium-226 into radon gas. In 2003, upgradient and downgradient monitoring wells at RML were sampled using low-flow techniques and analyzed for gross beta, radon gas, and gross alpha concentrations. Gross beta concentrations were similar in all wells and below the California

Department of Health Services standard of 50 pCi/L. Radon levels were compared to California's standards because Montana and USEPA do not have concentration-based standards for gross beta. Radon gas was present at levels above USEPA's proposed standard of 300 pCi/L (Maxim 2003). Gross alpha levels in all four wells were near or above MDEQ's 1.5 pCi/L standard, but all samples exhibited gross alpha levels below USEPA's MCL (15 pCi/L). Based on these data, data from Briar and Dutton (2000), and 2001 Hamilton municipal well data, the presence of radon, gross alpha radiation, and gross beta radiation in groundwater is associated with the naturally occurring decay of radioactive elements (e.g., uranium and daughter products) in the aquifer matrix.

The second water quality standard exceedance was from a June 1997 sample obtained from monitoring well 92-1 that exhibited total lead above the MDEQ circular WQB-7 standard. To confirm this finding, a sampling and analysis plan to re-sample site wells for total and dissolved lead during low and high groundwater elevations in 2001 was implemented. Results of 2001 groundwater monitoring confirmed that lead was not present above WQB-7 standards and indicated that the lead exceedance in the 1997 sample was most likely associated with naturally occurring suspended sediments entrained in the water sample (Maxim 2003).

3.9.11.2 Rationale for No Further Discussion

Implementing the Proposed Action would not result in release of potential contaminants to groundwater. Hazardous, radioactive, and solid waste would be handled in accordance with applicable laws and regulations. The only additional release of water to the subsurface would be in the five dry wells installed to allow storm water to infiltrate to the subsurface. Typically, minor concentrations of impurities (e.g., grease and oil, road salts) may be entrained by storm water from parking lots. These impurities would be filtered in the drywells. The Integrated Research Facility is not anticipated to have an impact on the quality of groundwater.