Valley Center

Local Hazard Mitigation Plan

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2014-2015| Senior Project

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The following document fulfills the senior project requirements set forth by the City and Regional Planning Department of California Polytechnic State University San Luis Obispo, to obtain a Bachelors of Science in City and Regional Planning. This project was conducted in the fall and winter quarters of the 2014-2015 academic years under supervisor Professor William Siembieda, Ph.D., AICP. The following document was created solely as an educational project and carries no legal authority.

Glossary

Executive Summary

This plan informs residents and agencies within Valley Center of the risks that face the community. The plan can be utilized by the County of San Diego as an informational document to assist in the current update of the 2015 Multi-Jurisdictional Hazard Mitigation Plan, as well as, being exercised by community enterprises to update or create hazard and disaster plans.

This plan identifies the largest natural hazard threat as wildland fire. Over 54% of the community is designated as Very High fire hazard zone; with the rest of the community being classified as High and Moderate fire hazard zones. The entire community faces the hazard of drought, which has significant impacts on the communities large-scale agricultural industry.

A feature of the plan is the specially developed and rendered set of GIS maps that allow for identification of hazards, community vulnerability analysis, and place estimated dollar losses to damaged structures within Valley Center.

The plan recommends mitigation measures that best suit the community and are most appropriate for community enterprises. These mitigations are intended to protect lives and property of the Valley Center community. The most important measures include:

- Develop an incentive program to promote water conservation techniques for all customers within the water district.
- Continue and increase public outreach and education to address fire prevention and mitigation efforts.
- Conduct a fuel management study throughout to ensure service levels and resource allocation.

Introduction

Throughout the United States, natural and man-made disasters have resulted in an increase of property damage, injuries, and loss of lives. The rising cost of disaster recovery in the past years has created motivation to explore different approaches to minimizing the vulnerability of communities across the nation.

Since 1999, there have been four presidential disaster declarations, three gubernatorial proclamations, and 13 local proclamations of emergency within San Diego County. Residing within an unincorporated portion of San Diego County, Valley Center recognizes the potential impacts upon the community and the necessity to reduce the impacts of both natural and man-made hazards.

This Local Hazard Mitigation Plan (LHMP) for Valley Center, CA, was prepared by Haydne Shimer as an educational senior project, for the completion of a Bachelor of Science in City and Regional Planning. The LHMP was created with the oversight of Professor William Siembieda, Ph.D., AICP and the use of the website *Beyond the Basics (http://mitigationguide.org)* which was created by the Center for Sustainable Community Design at the University of North Carolina at Chapel Hill. The site is designed to assist local

communities in developing/updating LHMPs that will meet the requirements set forth by the Federal Emergency Management Agency (FEMA) and is based upon the FEMA “Local Mitigation Planning Handbook.” A student review of this site is located within Appendix A.

Chapter 1
Background

1.1 Disaster Mitigation Act of 2000

In 2000, the United States Congress passed the Disaster Mitigation Act (DMA 2000), which amended the Robert T. Stafford Disaster Relief and Emergency Services Act by replacing the Mitigation Planning Section (409) with a new and updated Section on Mitigation Planning (322). The Disaster Mitigation Act of 2000 improves the disaster planning process greatly and places emphasis on planning before disaster strikes a community in order to reduce the impacts and rising cost of disasters. The DMA 2000 seeks to promote planning and coordination nationwide to strengthen hazard mitigation planning.

In order to implement the DMA 2000, the Federal Emergency Management Agency (FEMA) issued an Interim Final Rule in the Federal Register on February 26, 2002 (44 CFR section 201), which set forth requirements for state and local communities. In October of 2011, FEMA released the Local Hazard Mitigation Plan Review Guide to ensure “Federal and State officials assess Local Mitigation Plans in a fair and consistent manner”. Local plans must demonstrate that the measures proposed in the plan are based upon sound planning methods and accounts for individual risks and capabilities of the community. The FEMA Guide includes tools to assist reviewing bodies in assuring that all required portions of the LHMP have been met.

Local Hazard Mitigation Plans prepared to meet FEMA standards and State standards (when prepared in a state which is designated as a managing state and has an approved enhanced plan) make the preparing community eligible for funding and technical assistance through Pre-Disaster Mitigation Grants.

1.2 Plan Description

The Valley Center Local Hazard Mitigation Plan consists of the following sections.

Planning Process

Chapter 2 describes the plan creation process, the building of a planning team, and key stakeholders within the community. Additionally, this section includes a synopsis of existing reports, plans, and documents that were utilized in the construction of the Valley Center Local Hazard Mitigation Plan.

Community Description

Chapter 3 establishes the demographic and geophysical profile of Valley Center. The information is based upon the most current U.S. Census data and the use of County of San Diego GIS map data.

Risk Assessment

Chapter 4 identifies hazards within the community of Valley Center and the surrounding area. The information within this chapter includes historical data of natural hazard events and the impacts these disasters have had on the region.

Mitigation Strategies

Chapter 5 details the mitigation strategies developed by the student based upon the risk analysis and the input gathered from members of the planning team. The risk assessment findings dictated the prioritization of the mitigation strategies, which include preventative actions, property protection, emergency services, natural resource protection, and community awareness.

Plan Maintenance Strategies

Chapter 6 discusses a possible maintenance process to ensure that the plan is kept as an active and effective tool. The process includes monitoring, evaluating, and updating the LHMP if necessary, as well as, community education and involvement.

References

The references create an inventory of reference materials that were used to prepare this Local Hazard Mitigation Plan.

Appendices

The appendices include tables, lists, and maps that provide detailed information that was necessary to complete this plan. The GIS maps were prepared by Haydne Shimer using data provided by San GIS Regional Data Warehouse.

Chapter 2
Planning Process

2.1 Overview

The creation of the Valley Center Local Hazard Mitigation Plan began in September of 2014 and was completed in March of 2015. During the initial stages of the plan process, student Haydne Shimer created a planning team, which targeted representatives from a wide range of organizations and committees.

2.2 Invitation to Participate

Upon beginning the LHMP, a wide array of stakeholders and agencies were formally invited to take part in the plan process and provide input. Each party was sent an invitation through email and phone calls were placed to ensure parties were notified. Those who responded to the invitation and were willing to participate were placed upon the planning team. The parties that were invited to partake included:

- Valley Center Fire Protection District
- Valley Center Municipal Water District
- Valley Center Pauma Unified School District
- Valley Center Community Planning Group
- Valley Center Chamber of Commerce
- County of San Diego Office of Emergency Services
- San Diego County Supervisor & Valley Center Resident Bill Horn
- San Diego Gas and Electric

2.3 Planning Team

With Valley Center being an unincorporated community within San Diego County, emergency planning and services are conducted at different regional and local scales. In order to ensure that oversight of this LHMP was adequate, a partial planning team comprised of individuals who oversee agencies at all levels within the county was created. The planning team consisted of:

Name	Position & Department
Haydne Shimer	Student & Community Member / Cal Poly San Luis Obispo
Phil Bell	Board Member & Treasurer / Valley Center Fire Protection District
Gaby Olson	Safety & Regulatory Compliance Supervisor / Valley Center Municipal Water District
Tom Amabile	Senior Emergency Services Coordinator / San Diego County Office of Emergency Services
Cristina Jimenez-Sanchez	Special Projects Secretary / Valley Center Pauma Unified School District
Oliver Smith	Chair / Valley Center Community Planning Group

2.3.1 Planning Team Meetings

The planning team members met with student Haydne Shimer in the Fall of 2014 and participated in numerous phone interviews and meetings. The meeting types and dates of the planning team members with student Haydne Shimer are as follows:

- Phil Bell: Personal Meetings (1) on November 9, 2014, Phone Meeting (1), Email (4)
- Gaby Olson: Personal Meetings (1) on November 10, 2014, Phone Meeting (2), Email (4)
- Tom Amabile: Personal Meetings (1) on November 12, 2014, Phone Meeting (2), Email (2)
- Christina Jimenez-Sanchez: Personal Meetings (0), Phone Meeting (1), Email (3)
- Oliver Smith: Personal Meetings (0), Phone Meeting (1), Email (0)

2.4 Public Involvement

The DMA 2000 requires that open public involvement be incorporated within the planning process, that there be an opportunity for public comment during drafting and final implementation of the LHMP, and that input from neighboring jurisdictions and agencies is included.

While aware of this requirement, this plan did not incorporate any formal public involvement. Public involvement was forgone due to the nature of this plan being a student project. The development of this plan and the mitigation measures suggested were developed on the findings of the student's research and the meetings with the partial planning team. While the LHMP was not vetted through public involvement, it can however be utilized by the planning team members as an informational tool or be further researched to aid the County in the development of a LHMP that is specific to the Valley Center Planning Area.

2.5 Possible LHMP Adoption Methods for Unincorporated Communities

With Valley Center being an unincorporated community of San Diego County, the community has no formal adoption powers. Currently Valley Center's hazard planning is incorporated within the 2010 San Diego County Multi-Jurisdictional Hazard Mitigation Plan. Within this plan, Valley Center is grouped with other portions of the unincorporated county and addressed as a whole group. While this process can have specific advantages for the county as a whole, it also can have significant disadvantages for the individual communities, such as Valley Center. Listed below are some disadvantages for unincorporated communities when grouped together in a multi-jurisdictional plans:

- Limited in the amount of control over the planning process
- No ownership of the plan
- Hazard, capabilities, priorities, and disaster history that differ between communities are not individually assessed
- Lacks specific information on risks within the community

With these disadvantages, Valley Center has two options to increase mitigation efforts at the community level and implement a LHMP. The first option is to have a LHMP adopted or created at the district level such as the Valley Center Fire Protection District or the Valley Center Municipal Water District, which will allow for the plan to truly be created at the community level. The other option is for the county to create a LHMP for the community and adopt it as an addition to the *Valley Center Community Plan*. With the county having oversight over the community, this would be a feasible approach to creating a LHMP. The county will be able to utilize information it has already gathered through the completion of the multi-jurisdictional plan and supplement it through community participation, specifically community emergency services, stakeholders, and citizenry.

2.6 Incorporation of Relevant Plans and Documents

The planning process included the review and incorporation of existing plans, documents, and reports relevant the Valley Center LHMP. The following is a synopsis of the sources:

- The *2010 San Diego County Multi-Jurisdictional Hazard Mitigation Plan:* This plan was used to ensure consistency with the County's Plan and to gather information on the unincorporated portions of the county in which Valley Center resides. The plan also outlines mitigation strategies currently in place, which were used to develop mitigation strategies.

- The *2011 San Diego County General Plan Update Environmental Impact Report:* This plan addresses environmental concerns countywide and was utilized to gather information on current conditions within the County and past environmental history.

- The *2003 San Diego County Hydrology Manual:* This plan outlines hydrological hazards and policies for addressing water within the county and was utilized to gather hydrological information.

- The *2010 Valley Center Municipal Water District Urban Water Management Plan:* This plan outlines the current and past water usage within Valley Center and was utilized to gather information on water usage, land use, and forecasted characteristics of the community.

- Th*e State of California Multi-Hazard Mitigation Plan:* This plan was utilized to ensure that the Valley Center LHMP was consistent with the State's Plan.

Chapter 3
Community Description

3.1 Socio-Economic Characteristics

3.1.1 Overview

Valley Center is a small rural unincorporated community within northern San Diego County, California, “approximately 45 miles northeast of San Diego and 20 miles east of the Pacific Ocean Coast line” (McHenry, 1997, p. 9). (Appendix D, Map D-1) Valley Center is home to roughly 23,000 residents and is seen to many as a small close-knit family community. With many features that make the town unique, Valley Center offers a wide array of natural environments including hiking trails, beautiful scenic views, agricultural areas, and country style living.

<u>Valley Center</u>

Do not laugh at Valley Center,
It sits just where God has meant her,
Like a tiny outflung star
On the road to Palomar.
Splendid neighbors, kindly folk,
They sit back and laugh and joke,
Do not fret and fume and stew
As their neighbors southward do.

When you enter Valley Center,
Do not laugh, it’s where God meant her,
Planning, dreaming of the day,
When the world shall pass its way.
Journeying to Palomar,
Looking for a long-lost star,
Tiny, shining Valley Center,
Sleeping just where God has meant her.

Anonymous

3.1.2 History

In the beginning of 1862, San Diego County had barely 2,500 residents, but that would rapidly change with the passage of the Homestead Act. Signed in by President Abraham Lincoln on May 20, 1862, the Homestead Act gave 160 acre parcels to those willing to pay a ten dollar filing fee and start fresh out west (Lerner, 1997). This Homestead Act brought the first settlers to what is now known as Valley Center.

While permanent settlers did not call Valley Center home until 1862, mankind inhabited the area for generations. The first residents were the Luseño Native Americans. The Luseño inhabited the valleys and mountains of northern San Diego County. The Luseño people lived in small families with homes made of thatched plant material. The oak woodlands, creeks, and springs created a diverse landscape, which provided a unique place that the tribes still call home today (Rincon Band of Luiseño Indians, n.d.).

Valley Center has experienced many changes to become the town that it is today. In the spring of 1866, a Grizzly bear weighing 2,200 pounds was killed causing the town to become known as Bear Valley. Six years later, a postal application for a post office was filed and denied due to a town with the same name already existing in Mariposa County, California. As a result, this denied application was re-filed with the "Bear" portion of the name removed and it was accepted, hence creating Valley, CA. The name was then further changed to Valley Centre until the spelling was changed at a later date to Valley Center (Lerner, 1997).

Valley Center faced many challenges over the years including a wide range of natural disasters. The town was prosperous in the late 1800's, growing to include seven schools, a general store, and even a crank telephone. However, the community faced large-scale hardship in the early part of the 20th century. The largest obstacle facing the community was drought. The rains that had brought a measure of prosperity to the developing town ceased by 1912; the dry years nearly emptied Valley Center. Abandoned houses stood everywhere in old orchards, while hundreds of cattle and horses died for lack of food and water. Those hearty souls who managed to survive the dry years were tested again in 1916, when a series of storms devastated the town once again.

> "It rained steadily for six days, a flood beyond description roared through Valley Center. The Grade was cut in two and we were isolated for almost two months. All of our food supplies were unloaded by barge at Oceanside, then hauled up here by teams of wagons." Clyde James, January 1916. It was to become a familiar refrain. Valley Center is plagued by too much or too little rain" (Lerner, 1997).

Up until the 1950's, Valley Center remained reasonably remote with many residents farming and raising livestock. Although in 1955, the town changed due to two almost simultaneous events: the creation of the Valley Center Municipal Water District and the influx of citrus and avocado farmers. With the steady flow of water and the arrival of commercial agriculture, the Valley Center landscape of citrus, avocados, and nurseries were created (Lerner, 1997).

3.1.3 Population

The United States Census 2009-2013 American Community Survey documented an estimated population of 23,836 residents, of which 11,684 (49%) were male and 12,152 (51%) were female. The median age of the total population was 46 years of age.

3.1.4 Income

Based upon the 2009-2013 American Community Survey, the median household income in Valley Center was $90,504 with 8.7% of persons living below the poverty line. Of the total households within Valley Center, 75.2% received incomes, 35.2% received Social Security income, and 26.1% received retirement income other than Social Security. The mean Social Security income was $20,307.

In comparison with the County of San Diego, Valley Center exceeds the median income by approximately $20,000 dollars with the County of San Diego median household of $62,962.

3.1.5 Households and Families

The 2009-2013 American Community Survey documented the average household size at 2.93 persons, with 8,108 family households.

Table 3-1: 2009-2013 ACS Survey Populations by Age

Age	Percentage of Total Population
Up to 14 years	17.7%
15 to 24 years	11.7%
25 to 44 years	19.2%
45 to 64 years	33.6%
65 and above	17.8%
Total	**100%**

3.1.6 Housing

Based upon the United States Census Bureau's 2013 American Community Survey Five Year Estimates, there were 8,868 housing units within Valley Center.

Housing Characteristics of Valley Center based upon ACS Five Year Estimates:

- 91.4% housing units are occupied
- 83.7% of occupants own the unit
- 66.7% are 3 or 4 bedroom units
- 45.6% of units are valued between $300,000 and $499,000

Through personal communication with the County Assessor's Appraiser Michael Dollette, who has been the assessor for the area for the past three years, it has been determined that the average home value in Valley Center on a two acre parcel, is approximately $400,000 to $500,000, although homes in the area can easily exceed this range. Land in the area also

ranges greatly based upon location, utilities and the ability to be developed or utilized for agriculture, ranging from approximately $10,000 per acre to $50,000 per acre.

Based upon the interview with the County Appraiser, the local real estate office of Krueger Realty was contacted, where the comparative Market Analysis (CMA) for six months prior to the date of January 6, 2015, was acquired through Real Estate Agent Bob Hunsaker (Table 3-2). These values coincide closely with values given by the San Diego County Assessors Office.

Table 3-2: CMA Residential Summary Statistics for Homes on Two to Four Acres

	High	**Low**	**Average**	**Median**
List Price	$885,000	$263,900	$506,021	$479,500
Sale Price	$850,000	$263,900	$490,363	$470,000

3.1.7 Economy

Based upon the U.S. Census 2009-2013 American Community Survey, of the 23,836 persons residing within Valley Center, 10,929 or 56.7.2% of the population is in the labor force, with unemployment levels at 4.5% or 875 persons. Of the total working force in Valley Center, 84.2% rely upon private transportation to commute to work with 6.1% stating that work is conducted from the home and only 1.9% utilizing public transportation or walking to work. The mean travel time to work is 33.2 minutes.

In comparison, Valley Center has a lower unemployment rate than that of the County at 6.6%, based upon the 2009- 2013 American Community Survey.

3.1.8 Agriculture

The 2013 value of agriculture in San Diego County totaled $1,850,307,291, with a growth of over six percent from 2012 (County of San Diego, 2013, p. 1). Two primary crops that play a large role in San Diego County agriculture are wine grapes and avocados, which cover vast acreage in the Valley Center area. A large portion of Valley Center land is used for agricultural production. Based upon the San Diego County Department of Agriculture GIS (Geographic Information System) acreage data, Valley Center has approximately 30,000 permitted agricultural acres, producing over 90 different crops, ranging from small scale organic farms growing produce for local markets to large-scale commercial groves of avocados and citrus. Valley Center is also home to a modest amount of livestock ranchers, ranging from small scale to large commercial producers.

3.1.9 Electricity and Gas

San Diego Gas and Electric is the sole supplier of electricity within Valley Center. San Diego Gas and Electric provides services to approximately 3.4 million people through 1.4 million meters in San Diego County and a small portion of the San Clemente area in southern Orange County (San Diego Gas and Electric, 2015).

Based upon the U.S. Census 2009-2013 American Community Survey, natural gas is provided to 38.3% (3,107) housing units within Valley Center through utility gas lines while the remainder of Valley Center utilizes tanked liquefied petroleum gas. Due to the rural nature of the community and large lot sizes, propane tanks are utilized for the storage of gas at individual housing units. Gas is purchased by the homeowner from a wide array of propane retailers within the county.

3.1.10 Water

Water within Valley Center is supplied by the Valley Center Municipal Water District (VCMWD). In 1954, the Valley Center Municipal Water district was created in order to gain access to imported water supplies through the San Diego County Water Authority (SDCWA) and Metropolitan Water District of Southern California (MWDSC). Prior to the creation of the District, the area relied solely upon surface water sources and underground well water, which were consumed quickly in periods of insufficient rainfall. The District is overseen by an elected five-member Board of Directors, authorized by the State Legislature under the Municipal Water District Act of 1911; each member serves a four-year term (Valley Center Municipal Water District, 2015).

The district services the Community of Valley Center and the surrounding area, which is approximately 100 square miles (64,253 acres), with approximately 58% of the area receiving water from the district. The District's water supply is entirely imported from the SDCWA and is the fourth largest retailer of imported water and the largest purchaser of agricultural water in the SDCWA's service area. As of 2010, the district served 8,776 active water meters and 1,031 residential fire protection meters (Valley Center Municipal Water District, 2011, p. 2-1).

The District provides service to approximately 18,765 acres of agricultural lands. Agricultural service is predicted to decline in the future by as much as 75% by 2050. The 2035 projections for agricultural service are predicted to be approximately 13,585 acres, a decrease of 27% (Valley Center Municipal Water District, 2011, p. 2-1). Service to agricultural land is declining due to the increasing cost of water, reduction in active agriculture, or agricultural producers altering farming methods to reduce the amount of water that must be purchased.

Due to the varying topography within the District, distribution of water is completed through the hydraulic division of the system into 18 different pressure zones, 13 of which are pressure regulated to ensure flow. The system includes:

- Approximately 291 miles of pipe (Range- eight inches and larger in diameter)
- 42 Reservoirs (Range 100,000 gallons to 55.9 million gallons, Appendix D, Map D-2)
- 27 Pump Stations (Appendix D, Map D-3)
- 96 Pumps
- Total Pump Capacity (19,785 Horsepower)
- 7 Aqueduct Connections (In Service, Appendix D, Map D-3)

(Valley Center Municipal Water District Pressure Zone/Facility Map, 2014).

3.1.11 Historical and Projected Water Usage

The past and future projected water usage in the Valley Center Municipal Water District is located in Appendix-B, Tables B-1, B-2, B-3, and B-4.

3.1.12 Transportation

With the rural characteristics of Valley Center, the primary mode of transportation is the automobile. Valley Center has three main arterial roadways: Cole Grade Road, Lilac Road, and Valley Center Road, "which serves as the main linkage between the City of Escondido and Valley Center" (County of San Diego, 2011, p. 3). These arteries, while primarily used for automotive traffic are also used by bicyclists. The bicyclists on these roads are cyclists who ride for personal fitness and enjoyment and not for the purpose of travel. The only improved portion of bicycle lanes begins at the corner of Cole Grade Road and Valley Center Road continuing until Valley Center Road turns into Valley Parkway in Escondido to the South.

Pedestrian transportation in Valley Center is minimal, with the only improved pedestrian trail traveling for 2.5 miles alongside Valley Center Road from Cole Grade Road to Woods Valley Road. The trail is a tree-lined decomposed granite pathway that is open to multi-use non-motorized transportation including, walking, bicycling, jogging, wheelchairs and equestrians. The trail includes benches, picnic tables, hitching posts, and placards along the route with historical information on the town of Valley Center.

The North County Transit District serves Valley Center; the community is only served by one route, which runs every two hours. The route departs from the Escondido Transit Center and travels Valley Center road ending in the neighboring community of Pauma, where it then proceeds to turn around and travel the same route back south to the Escondido Transit Center. The route has two buses in service Monday through Sunday running approximately every two hours.

The Valley Center Pauma Unified School District offers free busing to and from all school campuses within the district, running approximately 18 morning and afternoon routes to and from schools within the district (Valley Center Times Advocate, 2014).

3.1.13 Education Levels

The 2009-2013 American Census Survey states that 86.7% of the population 25 years and older had a minimum of a high school education and 30.4% had a bachelors degree or higher. The total school enrollment in Valley Center was 5,842 for people 3 years and over. Nursery and kindergarten enrollment totaled 650. Elementary or high school enrollment totaled 3,773 students and 1,419 residents were enrolled in college or graduate school.

3.1.14 Schools

The Valley Center Pauma Unified School District covers approximately 330 square miles in northern San Diego County, being overseen by a five member elected school board and serves 4,200 students ranging from ages pre-school to high school. Being named a Distinguished School District, the district prides itself in its API rating of 822 (Valley Center Pauma Unified School District, 2014).

The district is composed of seven school campuses and one individual learning program*:

- Valley Center Primary (Pre-school through 2nd Grade)
- Valley Center Elementary School (3rd through 4th Grade)
- Lilac School (Kindergarten through 5th Grade)
- Pauma School (Pre-school through 8th Grade)
- Valley Center Middle School (6th through 8th Grade)
- Valley Center High School (9th through 12th Grade)
- Oak Glen High School (Flexible Learning Program)
- Valley Center Preparatory*

(Appendix D, Map D-5)

Table 3-3: Student Populations by School and School Year

School	School Year			
	2011-2012	2012-2013	2013-2014	2014-2015
Valley Center Primary	629	653	685	616
Valley Center Elementary School	509	497	549	559
Lilac School	559	588	620	613
Pauma School	276	297	280	312
Valley Center Middle School	828	833	778	788
Oak Glen School	62	61	53	57
Valley Center High School	1,237	1,167	1,139	1,156
Valley Center Prep School	87	113	87	87

(Source: VCPUSD Student Enrollment Summary Reports, 2011-2015)

3.1.15 Valley Center Fire Protection District

In 1982, the citizens of Valley Center voted to create the Valley Center Fire Protection District (VCFPD) to provide fire services and basic medical aid, overseen by a five member elected volunteer board. The district responds to approximately 1,300 calls a year within the 84.5 square mile district and has an average response time of nine minutes. The VCFPD is funded through property taxes and an additional benefit tax assessment district that was created in 1987, which is a 1% property tax at the assessed value and $50 per living unit (P. Bell, personal communication, November 9, 2014).

The district, when first formed contracted services from Cal Fire, which brought to the table a wide array of resources, ranging from equipment to advanced computer technology. However in August of 2013, the VCFPD ended its contract with Cal Fire due to an approximately 30% increase in contractual fees. This increase created a situation that was no longer financially feasible for the district. Beginning in September of 2013, the VCFPD entered into a contract with the neighboring San Pasqual Reservation Fire Department that would provide officer level staffing in conjunction with the district’s reserve firefighters.

As of January 1, 2015, the contract with San Pasqual Reservation Fire Department came to an end with the VCFPD deciding to pursue a traditional format fire department with a fire chief, battalion chief, and six captains. On November 21, 2014, the district hired on a new fire chief who is currently overseeing the changes that the district is experiencing. Due to the size constraints of the VCFPD, it is primarily a fire and basic emergency medical response department. While many of the firefighters have high quality training in specific firefighting, rescue, and medical operations, the department does not have the resources to operate at these levels. In order to fully provide the best service possible the department has Automatic Aid Agreements with neighboring departments who will come to assist when called upon. The VCFPD operates on a basic life support (BLS) level, with advanced life support (ALS) being contracted out to Mercy Ambulance Company.

Currently the department has two stations: Station 1 located at 28234 Lilac Road and Station 2 at 28205 North Lake Wolford Road, with both stations being staffed 24 hours a day. (Appendix D, Map D-6) The VCFPD currently has an Insurance Service Office (ISO) rating of a 5, meaning that any home within five miles of a station with proper fire water flow requirements will receive an ISO rating of a 5, but those outside that five mile limit are a 10 meaning they are unprotected. These rates play a role in homeowners insurance premium rates, the lower the rating the lower the premium. In order to protect a larger portion of the community and decrease ISO ratings further, a GAP analysis was conducted in 2008, which indicated that a third station may possibly be constructed in the upcoming years, “in the general area of the high school to better serve the community” (Lucia, 2013).

VCFPD Apparatus:

- 3 Front-Line Type 1 Fire Engines
- 1 Type 2 Fire Engine

VCFPD Personnel:

- 1 Fire Chief
- 1 Battalion Chief (To be hired)
- 6 Fire Captains
- 24 Firefighters
- 1 District Fire Marshal
- 1 District Administrator
- 1 Secretary
- 1 Part-time Bookkeeper
- 62.5% of Firefighters Possess College Degrees
- 83% of Firefighters are Practicing Paramedics (ALS) Outside of the District

3.1.16 Valley Fire Safe Council

The Valley Center Fire Safe Council is an associate council of the Fire Safe Council of San Diego. The council is a non-profit organization comprised of a five-member Board of Directors consisting of community members and stakeholders, as well as community volunteers. The Valley Center Fire Safe Council works with the fire department to identify hazards within the community, educate the public on fire safety and preparedness, fire prevention, and increase preparedness for wildfire events. The Council holds events such as free community chipping days to reduce fuel loading around homes and businesses and educational outreach at community events.

3.1.17 San Diego County Sherriff's Department

The San Diego County Sheriff's Department handles all law enforcement and patrol duties within Valley Center. The Sherriff's Department has been protecting Valley Center since its foundation in 1850. The local substation is located at 28201 North Lake Wolford Road in Valley Center and is responsible for providing "law enforcement services to over 25,000 residents and an area encompassing 330 square miles which includes the communities of Pala, Pauma and Rincon Valleys, Palomar Mountain, the Rancho Guejito Ranch, La Jolla, Pala, Pauma, Rincon, and San Pasqual Indian reservations" (San Diego County Sheriff's Department, 2013).

The Sherriff's Department utilizes the philosophy of Community Oriented Policing and Problem Solving. Deputies and members throughout the department utilize this philosophy, which focuses upon analyzing the community for problems and uses specific strategies to solve community wide problems. While the department has an expansive amount of resources at their disposal, the four primary divisions within Valley Center include: patrol, detective, crime prevention, and senior volunteers (San Diego County Sheriff's Department, 2013).

The Patrol Division has the following responsibilities:

- Respond to calls for service
- Patrol the community
- Conduct preliminary investigations
- Attend community events
- Make presentations to youth groups and schools

The Detective Division has the following responsibilities:

- Investigate all general crime cases and arrests made by deputies
- Determine if substantial evidence exists to prove a specific party has committed a crime
- Forward all case findings to the San Diego County District Attorney

Crime Prevention is responsible for the following programs:

- Neighborhood Watch
- Residential & Commercial Security Checks
- Operation Identification
- Personal Safety Presentations
- Children's Programs
- Senior Alert
- Business Alert
- Agricultural Crime Investigations

Senior Volunteers is a program open to community members 50 years and older and has been in existence in Valley Center since August 1995. Volunteers undergo a background check, receive training, and volunteer a minimum of six hours per week (San Diego County Sheriff's Department, 2013).

The Senior Volunteers provide the following services to the community:

- Make vacation home security checks
- Visit the homebound through the YANA Program (You Are Not Alone)
- Enforce handicapped parking regulations
- Patrol in Senior Volunteer Patrol marked vehicles
- Assist in crime prevention with public presentations
- Conduct residential and business security surveys
- Assist in locating Alzheimer’s patients

3.2 Geophysical Characteristics

3.2.1 Climate

The Köppen Classification System rates Valley Center as a Mediterranean/Hot Summer climate type, which has an overall mild climate with hot and dry summers. The area has "at least four months with average temperatures of over 50°F, frost danger in winter, and at least three times as much precipitation during wettest winter months as in the driest summer month" (Pidwirny, 2011).

Within San Diego County there are five distinct climate zones. The County has classified Valley Center as being within the Transitional Climate Zone, (Appendix D, Map D-7) with the general characteristics of this zone being mild, wet winters and warm dry summers. Precipitation falls in the winter months from January to March averaging 13 to 15 inches per year. (Appendix D, Map D-8) Following the wet winter months are extended periods of drought, with long hot, dry spring and summer days.

Table 3-4: Precipitation and Temperature Records, 1999-2010

Year	Average Temp (F°)	Total Rainfall (Inches)
1999	63.75	6.62
2000	65.99	4.81
2001	65.11	11.68
2002	63.84	5.83
2003	62.82	13.00
2004	60.48	14.49
2005	66.23	17.42
2006	60.78	3.54
2007	60.32	4.32
2008	61.78	4.22
2009	60.32	5.94
2010	61.46	14.04

(Source: Valley Center Municipal Water District, 2011, p. 2-4)

3.2.3 Geography

The geography of Valley Center is quite unique in that it includes a wide array of topographical variations. The region is composed of steep slopes, flat creek beds and valleys, and rolling hills. Due to modern technology, the diverse topography has not limited building and expansion; much of the landscape has been molded to accept roadways and housing. A majority of the steeper portions of the region have been left as wildland or are used for the agricultural production of avocado and citrus trees that flourish in the southern California climate.

3.2.4 Soils and Vegetation

As a result of Valley Center's diverse topography, there have been 23 different true soils identified with eight different land types. Land types are areas that due to topography or composition do not fall into a specified soil series. (Appendix B, List B-1). A soil series is a group of soils with profiles that are most similar to each other in horizontal layering, thickness of layers, and arrangement, with the only difference being in the texture of the soil's surface layer. While soils are similar, their anthropogenic uses can differ based upon slope or other characteristics (U.S. Department of Agriculture, 1973, p. 6). The profiles below describe the soil series found in Valley Center and discuss the vegetation that occurs in their natural state and the agricultural practices that the soil can be used for. With changing agricultural technology and knowledge, many soil series are available for agricultural production that may not have been accessible in past years.

Anderson Series

This soil series consists "of somewhat excessive drained very gravelly sand loams" (U.S. Department of Agriculture, 1973, p. 24). The representative profile includes a surface layer of brown to dark brown, slightly acid very sandy loam roughly 25 inches thick, with the substratum layer below changing to a reddish-brown to strong brown. This soil series is utilized for production of avocados, citrus, or rangeland. The vegetation in uncultivated areas is comprised of flattop buckwheat, California Sagebrush, sumac, coast live oak, and annual forbs and grasses (U.S. Department of Agriculture, 1973, p. 24).

Arlington Series

This soil series consists of reasonably well drained, moderately deep course sandy loams. The representative profile includes a surface layer of neutral coarse sandy loam roughly nine inches thick and a yellowish-brown sub soil roughly 24 inches thick. The vegetation includes flattop buckwheat, filaree, wild oats, shrubs, and annual grasses and forbes. This soil series is primarily utilized for rangeland, but can also be used in the growth of flowers and truck crops (U.S. Department of Agriculture, 1973, pp. 24-25).

Bonsall Series

This soil series consists of reasonably well drained, shallow to moderately deep sandy loams with heavy clay subsoil. The representative profile includes a surface layer that consists of ten inches of brown slightly acid loam, with a yellowish-brown clay and sandy loam roughly 50 inches thick. Natural vegetation is primarily filaree, mustard, wild oats, and annual grasses and forbs. Bonsall soils are best used for range due to the drainage properties, but can be utilized for irrigated crops such as flowers and citrus (U.S. Department of Agriculture, 1973, pp. 28-29).

Cieneba Series

This soil series consists of excessively drained, shallow sandy loams. The representation of the soil consists of a brown, medium acid sandy loam roughly ten inches thick, with weathered granodiorite. Vegetation is primarily flattop buckwheat, chamise, California Sagebrush, and annual grasses and forbs. Soil can be utilized for irrigated agricultural crops such as avocados and citrus (U.S. Department of Agriculture, 1973, p. 38).

Escondido Series

This soil series consists of moderately deep, well drained very fine sandy loams. The representative profile of the surface layer consists of a dark brown slightly acid sandy loam roughly six inches thick, with brown, neutral subsoil roughly 23 inches thick. The substratum below is hard fine-grained sedimentary rock. Natural vegetation consists primarily of filaree, ripgut brome, California Sagebrush, wild oats, and annual grasses and forbs. Agricultural production can range from citrus to flowers and row crops, but due to hard substratum, the soil series is used primarily for grazing in many cases (U.S. Department of Agriculture, 1973, p. 45).

Fallbrook Series

This soil series consists of well drained moderately deep sandy loams. The representative profile is comprised of a brown, slightly acid sandy loam about six inches thick, with a reddish-brown, slightly acid sandy clay loam subsoil roughly 41 inches thick, and a substratum of decomposed granite. The natural vegetation consists of annual grasses, oak, broadleaf chaparral, and intermittent areas of chamise. Agricultural crops range from avocado and citrus to row and grass crops (U.S. Department of Agriculture, 1973, pp. 46-47).

Friant Series

This soil series consists of very shallow well drained fine sandy loams. The surface soil is dark brown and roughly 12 inches thick. Beneath this lies metasedimentary rock. Natural vegetation is comprised of California Sagebrush, flattop buckwheat, white sage, wild oats, and annual grasses and forbs. This soil is primarily found on steep sloped hillsides and not utilized for agricultural crops, although the soil can provide rangeland grazing (U.S. Department of Agriculture, 1973, p. 49).

Greenfield Series

This soil series consists of well drained very deep sandy loams. The representative profile of the surface layer is brown, slightly acid sandy loam roughly six inches thick. The subsoil is yellowish-brown, slightly acid loam with a thickness of 28 inches with the substratum extending to a depth in excess of 60 inches and composed of neutral loamy course sand. Natural vegetation is comprised of a wide variety of flora including wild oats, mustard, foxtails, and coast live oak (U.S. Department of Agriculture, 1973, p. 51).

Las Posas Series

This soil series consists of well drained, moderately deep stony fine sandy loams. The representative profile includes a surface layer of reddish-brown, neutral stony fine loam about four inches thick, a reddish-brown subsoil roughly 29 inches thick, and a substratum that is deeply weathered gabbro rock. Natural vegetation includes chaparral oak, chamise, sumac, California Sagebrush, annual grasses, and in specific areas oak trees. Agricultural uses are primarily truck crops and range land for grazing (U.S. Department of Agriculture, 1973, p. 61).

Placentia Series

This soil series consists of moderately well drained sandy loams with sandy clay subsoil. The representative profile includes a surface layer of brown, medium acid loam about 13 inches thick, a brown moderately alkaline subsoil roughly 40 inches thick, and a substratum of moderately alkaline sandy clay loam. Natural vegetation includes, oaks, soft chess, wild oats, chamise, and vinegarweed. Agricultural production can be wide ranging from dry farmed crops to irrigated orchards (U.S. Department of Agriculture, 1973, p. 68).

Ramona Series

This soil series consists of well drained, very deep sandy clay loam soil. The representative profile includes a surface layer of browns, slightly acid sandy loam about 17 inches thick, a subsoil that is brown, slightly acid sandy clay loam roughly 43 inches thick, with a neutral coarse sandy clay loam below. Natural vegetation includes mouse barley, wild oats, liaree, soft chess, chamise, annual forbs, and oaks. This soil allows for a large array of agriculture ranging from truck crops to irrigated fruit trees (U.S. Department of Agriculture, 1973, p. 70).

Tujunga Series

This soil series consists of very deep, excessively drained sands. The representative profile includes a surface layer of brown, neutral sand about 14 inches thick, with the layers below being composed of course sand exceeding a depth of 60 inches. Natural vegetation is comprised of annual grasses and a small amount of oaks scattered without. Agricultural production is limited and must be irrigated due to excessive drainage (U.S. Department of Agriculture, 1973, p. 80).

Visalia Series

This soil series consists of moderately well drained, very deep sandy loams. The representative profile is comprised of a dark grayish-brown sandy loam surface layer roughly 12 inches thick, with the following layers being slightly acid loam and sandy loam exceeding 60 inches in depth. Natural vegetation includes annual grasses, chamise, flattop buckwheat, California live oak, and scrub oak. Visalia soils can be utilized in many agricultural operations, including dry farming and irrigated crops (U.S. Department of Agriculture, 1973, p. 81).

Vista Series

This soil series consists of well drained, moderately deep coarse sandy loams. The representative profile consists of a dark brown, neutral sandy loam surface layer roughly 19 inches thick, with a coarse sandy loam subsoil that is roughly 16 inches thick and a substratum of heavily weathered granite rock. Natural vegetation includes chamise, flattop buckwheat, wild oats, foxtail, annual forbs, and oaks along drainages and north facing slopes. The primary agricultural uses of this soil series include avocados, citrus, truck crops, and rangeland (U.S. Department of Agriculture, 1973, p. 82).

Land Types

Titles given to lands within Valley Center that do not fall under a specific soil series or comprise an area that is severely eroded, extremely steep, or excessively rocky that can not be defined as a soil series are considered land types. There are eight land types within Valley Center as follows:

- Acid Igneous Rock Land
- Metamorphic Rock Land
- Clayey Alluvial Land
- River Wash
- Rough Broken Land
- Steep Gullied Land
- Stony Land
- Terrace Escarpment

3.2.5 Geology

The county of San Diego is located along the Pacific Rim; a geological "area characterized by island arcs with subduction zones forming mountain ranges and deep oceanic trenches, active volcanoes, and earthquakes" (County of San Diego, 2011, p. 2.6-1). A subduction zone is any area in which two lithospheric plates come together, one riding over the other (United States Geological Survey, 2012). As a result of this subduction zone, San Diego County has three distinct geographic regions that from west to east are:

- The Coastal Plain
- The Peninsular Range
- The Desert Basin

(County of San Diego, 2011, p. 2.6-3)

Valley Center lies within the Peninsular Range, which runs up the center of the county. The Peninsular Range region in San Diego County is comprised of foothills that range in elevation from 600 to 2,000 feet above sea level. The lay of the land consist of rolling to hilly uplands with narrow winding valleys. As the elevation increases, granitic rock outcroppings and rock faces become more frequent. Vegetation in this region shifts from chaparral brush on the western slopes, to temperate forest vegetation near the slope pinnacle, and desert chaparral on the eastern slopes (County of San Diego, 2011, p. 2.6-2). This vegetation layout is a result of the mountainous layout of the Peninsular Range creating a rain shadow from west to east.

The region is underlain by plutonic igneous rocks that were formed as a result of the cooling of molten magmas deep within the crust of the earth. These magmas originated 90 to 120 million years ago during subduction of an oceanic crustal plate that converged on the North American Plate (County of San Diego, 2011, p. 2.6-3). Over those 30 million years, extensive amounts of plutonic rock accumulated within the crust. Combined with the intense heat, these plutonic intrusions metamorphosed the sedimentary rock that was already present,

thus forming the Peninsular Range of today consisting of quartzite, marble, slates, schist, and gneiss rock (County of San Diego, 2011, p. 2.6-3).

3.2.6 Hydrology

The hydrologic cycle is the cyclical movement of water on (surface water), above (water in a gaseous state), and below the Earth's surface (groundwater). (Appendix D, Map D-9) The surface water in Valley Center consists primarily of seasonal streams (Appendix D, Map D-10) and fluctuates with the amount of rain received during the wet portions of the year. Groundwater within the community exists in two different forms: fractured rock aquifers and alluvial and sedimentary aquifers (County of San Diego, 2011, p 2.8-1).

Fractured Rock Aquifers

Underlying a large amount of Valley Center, fractured rock aquifers are typically composed of crystalline or metavolcanics associated with the Peninsular Range. These aquifer types are common in the mountainous portions of the county and the inland mountain valleys. These wells have relatively fast recharge rates due to the increased precipitation in the mountainous portions of the region and consolidated sediment rock, although these wells have been known to have quick declines in the water table. Portions of San Diego County with these aquifers have seen a change in water level in excess of 100 feet in particular rainy or dry seasons. Wells drilled into these aquifers may vary greatly in water production, due to the fractures within the rock layers. Generally wells within these aquifer types produce relatively low amounts of water, many exceeding 1,000 feet, although in other cases, these wells if intersecting with several fractures within the rock can produce anywhere upwards of 100 gallons per minute (County of San Diego, 2011, p 2.8-2).

Alluvial and Sedimentary Aquifers

Generally found in intermountain valleys and river and stream valleys, alluvial and sedimentary aquifers are composed primarily of consolidated or unconsolidated sand, gravel, silt, and clay. These aquifers typically have a high storage capacity because of the porosity of the sediments. Recharge of these aquifers is slower than that of the fractured rock aquifer, but typically result in a high yielding well. Wells drilled within an alluvial and sedimentary aquifer may produce hundreds of gallons per minute (County of San Diego, 2011, p 2.8-2-3).

3.2.7 Watershed

Based upon San Diego GIS mapping, Valley Center resides primarily in the San Luis Rey River Watershed, with a small southern portion of the community extending into the bordering watersheds of the Carlsbad Watershed to the southeast and San Dieguito Watershed to the southwest (Appendix D, Map D-11).

3.2.8 San Luis Rey Watershed

This watershed is one of the most northern watersheds within San Diego County. The San Luis Rey River is the primary water body beginning near Palomar Mountain and the mountains near Anza Borrego Desert State Park to the northeast of Valley Center at an elevation exceeding 6,000 feet above sea level. The river extends over 55 miles and runs through the 360,000-acre watershed, with the final outlet being the Pacific Ocean near the City of Oceanside, CA. Of the 360,000 acres, 49% of the watershed is privately owned, 37% is publicly owned, and 14% consist of six Tribal Indian Reservations, with the primary population centers including the City of Oceanside and the unincorporated communities of Bonsall and Valley Center (Project Clean Water, 2014).

Table 3-5: Land Use Breakdown of San Luis Rey River Watershed

Land Use Type	Percent of Watershed
Vacant/Undeveloped	54%
Residential	15%
Agricultural	14%

(Source: Project Clean Water, 2014)

Chapter 4
Risk Assessment

4.1 Overview of the Risk Assessment Process

In order to conduct a risk assessment, a community must gather and analyze hazard related data to assist in identifying and prioritizing mitigation strategies that will be appropriate and effective at reducing the impacts of potential hazards. The five steps of risk assessment are outlined below.

Identify Hazards

Hazard identification is the process of recognizing natural and man-made hazards within a community. Natural hazards are a result of natural unexpected and uncontrollable events that can cause damage. Man-made hazards are hazards that are present within a community as a result of human activities. A variety of sources were used in the construction of the Valley Center LHMP including past hazard history and San Diego County GIS data to determine a full range of potential hazards and impacts.

Profile Hazards

Hazard profiling consists of describing hazards based upon their history and physical properties including magnitude, frequency, location, duration, and probability. Hazards for this plan were identified through a variety of sources. The identified hazards were then added as layer maps to a Valley Center base map to create hazard maps in order to determine the extent of the hazard and areas that are at risk from the hazard.

Identify Assets

Assets are structures, facilities, populations, and public infrastructures that may be affected by a hazard event. Asset information for Valley Center was gathered from the U.S. Census Bureau and input from the planning team.

Vulnerability

Vulnerability describes the degree to which an asset is susceptible to the event of a hazard. Vulnerability is dependent upon many factors such as construction, material, and the economic value. A vulnerability assessment predicts the extent of damage or injury an asset may incur from a hazard event. The assessment provides estimated quantifiable data that may be utilized to develop and prioritize mitigation measures.

Analyze Future Development Trends

Future development trends are the general overview of land use change, development expansion, and population growth that is expected to occur within the community. This information provides the framework for decision making about mitigation strategies and locations where mitigation should be applied.

4.2 Hazard Identification

During the preliminary process of this plan, a wide variety of hazards were known to be present in Valley Center. As a result of time constraints, four hazards were identified by the planning team as being of high concern, due to past history, current events, or community perception. The following table is the list of those hazards and the reasoning for their selection in alphabetical order:

Table 4-1: Hazards Facing Valley Center

Hazard	Explanation
Drought	The community is in extreme drought conditions.
Earthquake	The community is located in a seismically active and complex region.
Flood	Parts of the community reside in the 100-year floodplain. Diverse topography coupled with heavy rains can cause localized and riverine flooding in the community.
Wildland Fire	The community faces wildland fire hazards and has a history of severe wildland fire.

4.3 Hazard Profile

The specific hazards that were selected by the planning team for profiling have been examined based upon the following factors:

- Nature
- History
- Location
- Extent
- Probability of Future Events

The hazards profiled for the community of Valley Center are listed below in Chapter 4.3.1 through 4.3.4. The hazards are listed alphabetically and do not reflect the level of risk or importance.

4.3.1 Drought

4.3.1.1 Nature of Hazard

"Drought, or an extreme dry period, is an extended time frame where water availability falls below statistical requirements for a region. Droughts are not purely a physical phenomenon, but rather interplay between the natural water availability and human demands for water supply" (City of San Luis Obispo, 2014, p.42). While the term "drought" is primarily thought to mean a lack of rainfall, there are three different types of drought. The three types of drought are as follows:

Hydrological Drought

Hydrological drought is the deficiency in surface and subsurface water supply as a result of reduced or deficient precipitation (North Carolina Drought Management Advisory Council, 2014).

Agricultural Drought

Agricultural drought occurs when soil moisture is insufficient to meet the demands of a particular crop at a specific point in time (North Carolina Drought Management Advisory Council, 2014). This type of drought can be present even during times of average precipitation, due to soil conditions or agricultural practices.

Meteorological Drought

"Meteorological drought is usually based on precipitation's departure from normal over some period of time. These definitions are usually region-specific, and presumably based on a thorough understanding of regional climatology. Normally, meteorological measurements are the first indicators of drought" (North Carolina Drought Management Advisory Council, 2014).

4.3.1.2 History, Location, & Extent

Drought is an extreme weather event that affects Valley Center, as well as, the entirety of San Diego County. Lack of precipitation can lead to significant health, agricultural, economic, and social impacts. Drought can reduce the amount of ground and surface water available to the population and can lead to a decrease in water quality. Lower water levels reduce the amount of dilution of pollutants resulting in an increased risk of water contamination (City of San Luis Obispo, 2014, p.44).

The United States Drought Monitor is a weekly map that is released through the joint efforts of the National Oceanic and Atmospheric Admiration (NOAA), the United States Department of Agriculture (USDA), and the National Drought Mitigation Center (NDMC) at the University of Nebraska-Lincoln, which monitors drought conditions across the United States. The NDMC classifies drought into five different categories, which are as follows:

- D0: Abnormally Dry
- D1: Moderate Drought
- D2: Severe Drought
- D3: Extreme Drought
- D4 Exceptional Drought

Note: Full break down of drought categories and the possible impacts are located in Appendix C, Table C-1.

The NDMC’s latest drought map, released on February 5, 2015, shows the western portion of San Diego County as being classified as D3: Extreme Drought, with the eastern portion of San Diego Falling into the category of D2: Severe Drought. Valley Center is within the Extreme Drought category. One year ago, in February of 2014, Valley Center was in a category D2: Severe Drought. In February of 2013, the category was D1: Abnormally dry. In February of 2012, no drought was classified. Valley Center has experienced a one-class degradation every year since 2012 (United States Drought Monitor, 2015). (Appendix D, Map D-12)

4.3.1.3 Probability of Future Events

Drought and weather are difficult to predict and can fluctuate from regional to statewide in size and impact. It has been noted throughout the history of Valley Center concurrent dry years have compiled to create drought type conditions. Drought is unpredictable and the probability of occurrence in the future is difficult to forecast.

4.3.3 Earthquake

4.3.2.1 Nature of Hazard

"Earthquake is a term used to describe both sudden slip on a fault, and the resulting ground shaking and radiated seismic energy caused by the slip, or by volcanic or magmatic activity, or other sudden stress changes in the earth" (United States Geological Survey, 2012). Shaking as a result of an earthquake can be felt both at the site of occurrence and region around the occurrence. This event is not able to be predicted and often happens with no warning. Earthquakes have a large potential for causing large-scale damage, injuries, and causalities within a matter of seconds. The resulting damage from an earthquake depends upon the energy that is released from the stress changes within the earth, the location of the epicenter (location on the earth above the slip), and the soils on which the built environment rest upon. These factors will determine the impact severity. Earthquakes are measured by magnitude and intensity.

Richter Scale

The Richter Magnitude Scale is a mathematical device designed to compare the size of earthquakes by determining the magnitude through the logarithm of the amplitude of waves recorded by seismographs. The scale includes adjustments for variations in seismographs and expresses earthquake magnitude in the form of whole numbers and decimal fractions (United States Geological Survey, 2012). With the scale being logarithmic, each point increase on the scale corresponds to a 10-fold increase power and a 32-fold increase in energy (County of San Diego, 2010, p. 4-23). Therefore, an earthquake with a magnitude of 8 is 100 times (10 x 10) greater in power and 1,024 (32 x 32) greater in energy than an earthquake with a magnitude of 6 (See Appendix C, Table C-2).

Modified Mercalli Intensity Scale

Intensity is the effect that an earthquake has on the Earth's surface, which is measured by utilizing the Modified Mercalli Intensity Scale. While several intensity scales have been developed over the past 100 years, the Modified Mercalli Intensity Scale is the one that is currently in use today in the United States. The scale is based upon arbitrary ranking by designated Roman numerals based upon observations. The lower Roman numerals begin with the manner in which people feel the earthquake, with the larger Roman numerals being assigned built upon structural damages observed (United States Geological Survey, 2014). (See Appendix C, Table C-3 and C-4)

4.3.2.2 History, Location, & Extent

Within Valley Center there have been no recorded earthquakes that have caused major damages. Within San Diego County there have been several moderate earthquakes in the recent decades along the Rose Canyon Fault Zone underneath the City of San Diego registering at magnitudes of 3.9, 4.0, 3.9, and 4.7 (County of San Diego, 2010, p. 4-25). The most recent significant earthquake activity occurred on June 15, 2004, with a magnitude of 5.3 on the San Diego Trough Fault Zone approximately fifty miles southwest of San Diego, which reported as an IV on the Modified Mercalli Intensity Scale (County of San Diego, 2010, p. 4-25).

Based upon San Diego GIS data, Valley Center is in close proximity to two different sections of the Elsinore Fault Zone:

- Temecula Section of the Elsinore Fault Zone (approximately 2.3 miles to the northeast)
- Julian Section of the Wildomar Fault, which is a fault within the Elsinore Fault Zone (approximately 8.2 miles to the east)

The Elsinore Fault is a strike slip fault and "one arm of a trilateral split of the San Andreas Fault" (Singer, n.d.). In recent documented history, this fault has been considerably quiet. (Singer, n.d.). In 1910, the fault produced a magnitude 6.0 earthquake to the north of San Diego County, resulting in minimal damage (Southern California Earthquake Data Center, 2013). The fault has the probable magnitude range of 6.5 to 7.3 (Deméré, 2003).

4.3.2.3 Probability of Future Events

Profiled earthquake hazard areas within Valley Center are shown in Appendix D Maps D-13 and D-14. The hazard areas were obtained through San Diego County GIS (San GIS) and are based upon United States Geological Survey (USGS) modeling that shows the probable peak ground acceleration throughout San Diego County. "Since 1984, earthquake activity in San Diego County has doubled over that of the preceding 50 years" (Deméré, 2003). Current field studies suggest the following maximum likely magnitudes for local faults of San Diego County:

- San Jacinto: Magnitude 6.4 to 7.3
- Elsinore: Magnitude 6.5 to 7.3
- Rose Canyon: Magnitude 6.2 to 7.0
- La Nacion: Magnitude 6.2 to 6.6
- Coronado Bank: Magnitude 6.0 to 7.7
- San Clemente: Magnitude 6.6 to 7.7

(Source: Deméré, 2003)

4.3.3 Flood

4.3.3.1 Nature of Hazard

Flooding is the accumulation of excess water from rainfall, snowmelt, or storm surge in areas that are normally dry. Floods can also occur when water accumulates in natural water bodies such as creeks, streams, rivers, or lakes and the water overflows the banks and into an adjacent floodplain. Floodplains are low-lying lands neighboring water bodies that are subject to reoccurring flooding. Flooding is a natural event that can range from a water depth of several inches to several feet. Floods can cause substantial property damage and pose a life threat to the population through drowning and being swept away by water currents. The average rainfall within Valley Center is approximately 8.83 inches based upon 1999-2010 rainfall averages (Valley Center Municipal Water District, 2011, p. 2-4).

Flash Floods

There are several factors that determine a flood's severity and its impact upon a community, including intensity and duration of rainfall, watershed slope, vegetation, floodplain layout, and soils. When rain falls at a high intensity in a short time period, the soils are not able to absorb the water causing the excessive water to runoff and accumulate in low-lying lands. This condition is known as a flash flood, which is a swift rise in water levels that flow at a high velocity and can carry a large amount of debris down current. Flash floods have a large potential for damaging both the natural and built environment (California Department of Water Resources, 2014). Flash floods can also be caused by dam failure or sudden spills of a large volume of water. The portions of San Diego County that are most susceptible to flash floods are terrain types of mountainous canyons and dry creek beds.

Dam Inundation

Dam inundation is the failure of a dam, levee, or artificial barrier, which causes the water body to charge out into the low-lying grounds adjacent to the water body. Dam failure may cause flash flooding and possess a threat to a small amount of agricultural acreage in Valley Center.

Localized Flooding

Localized flooding is the flooding of smaller geographical areas, primarily outside of recognized flood zones, due to substantial precipitation, surface runoff, and the inundation of a storm water system. This flood type mainly occurs as a slow rising water level and has minimal water velocity. Damage is primarily minor and small scale (California Department of Water Resources, 2014). With the diverse topography of Valley Center this flooding event is possible in small portions of the community, but is not widespread.

Riverine Flooding

Riverine flooding is defined by the California Department of Water Resources as a flood occurring when rivers, streams, or lakes overflow their banks, including flooding in areas adjacent to local streams and creeks. This flood type can occur in both hilly regions to flat plains along water bodies. This is the primary type of flooding that can occur within Valley Center due to the hilly regions and confined channels that are present. The steeper the

topography and narrower the floodplain, the quicker the flooding comes on and is typically confined by the topography (California Department of Water Resources, 2014).

4.3.3.2 History, Location, & Extent

With the varying topography in Valley Center, floods have been limited to only small portions of the community. In 2011, the San Diego County General Plan Update Environmental Impact Report Section 2.8 Hydrology and Water Quality determined that the community of Valley Center has 1,134 acres within the 100-year floodplain that consist of agricultural, vacant, and residential land uses.

The County of San Diego has documented three floods that have occurred within the boundaries of Valley Center (Table 4-6). Records show that severe floods within the San Luis Rey Watershed surrounding Valley Center have impacted the town greatly, dating back to 1916.

Table 4-2: Historic Flood Damage and Cost

Date	Property Damage in Dollars
February 18, 2004	$30,000
February 26, 2004	$35,000
March 2, 2004	$20,000

(Source: County of San Diego, 2011, p 2.8-79)

Table 4-3: Dam Inundation Acreage

Dam	Acreage	Existing Land Use in Dam Inundation Zone
Stehly Upper	131	Agricultural/Vacant
Stehly Lower	128	Agricultural/Vacant
Turner	776	Agricultural/Parks

(Source: County of San Diego, 2011, p 2.80-81)

4.3.3.3 Probability of Future Events

Likelihood of future flood events is based upon Flood Insurance Rate Maps (FIRMs) created by the Federal Emergency management Agency (FEMA). Map data was acquired through San Diego County San GIS and they depict locations within Valley Center that are likely to be inundated by water in the event of the following flood types:

- The 100-year Floodplain (The 1% annual chance of flooding, Appendix D, Map D-15)
- Dam Inundation (Appendix D, Map D-16)

The possibility of flooding within the County of San Diego primarily occurs during the season of highest precipitation or during periods of heavy rain after prolonged dry periods (County of San Diego, 2010, p. 4-30).

4.3.4 Wildland Fire

4.3.4.1 Nature of Hazard

Fire hazard can exist in two different forms: structural fire and wildland fire. Structural fire is when fire is started in an urban setting and moves rapidly throughout the built environment from building to building. Since Valley Center is a rural area and homes are located on large land parcels, structural fire hazards will not be focused upon in this local hazard mitigation plan.

Wildland fire is, “any non structure fire that occurs in vegetation and natural fuel” (NWCG, 2014). These fires can often go unnoticed in the beginning and spread rapidly posing a great threat to life and property in the wildland urban interface (WUI). The WUI is “the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels, within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildfire” (NWCG, 2014). Wildland fires are started in four different ways: extraterrestrial impacts, rock on rock friction, lightning strikes, and anthropogenic (human) related origins. Humans are the reason for over 80% of all wildland fires, through carelessness, burning of debris, or arson (County of San Diego, 2010, p. 4-43). Wildland fire possesses a great risk to Valley Center, due to the factors that determine the behavior of wildland fires. “Fire behavior is commonly defined as the manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena as determined by the interaction of fuels, weather, and topography” (Applied Wildland Fire Behavior Research & Development, 2013).

Fuel

Fuel plays a significant role in fire behavior. While fuel does not specifically cause fire, it unquestionably determines the character of a fire by affecting ease of ignition, size, and flame intensity (Pyne, Andrews, & Laven, Wildland Fuels, 1996, p. 91). Critical aspects of fuel include the continuity of fuel to allow a fire to keep spreading, the moisture within fuel that dictates how quickly fuels burn, the arrangement of fuels, and the density of vegetation (fuel load). Natural vegetation becomes increasingly susceptible to wildland fire in times of drought when moisture content of living and dead plant material decreases. Fuel is heavily influenced by its topographical location and climate. Fire preparedness and mitigation is primarily focused upon fuel management around properties since it can be modified by human actions.

Weather

Weather is the largest variable of fire behavior. Weather elements such as temperature, relative humidity, and precipitation are crucial aspects of how a fire behaves and spreads. The most dominant of all weather elements is wind. Wind is highly inconsistent and difficult to predict. Local topography, heating and cooling, and vegetation all play a role in wind speed and direction (Pyne, Andrews, & Laven, Wildland Fuels, 1996, p. 52). Weather conditions of low temperatures and high relative humidity are the best conditions for slowing fire spread and aiding in the containment by emergency crews, while higher temperatures and low relative humidity can cause extreme fire behavior.

Topography

"Topography includes the elements of slop steepness, aspect, elevation, and configuration of the land" (Pyne, Andrews, & Laven, Wildland Fuels, 1996, p. 49). Topography can result in large changes in fire behavior as the fire spreads across the terrain. Topography interacts with fuel and weather by influencing fuel type and moisture content and creating general weather patterns such as wind speed and direction (Pyne, Andrews, & Laven, Wildland Fuels, 1996, p. 49). Topography plays a large role in a fires rate of spread (ROS) and direction of spread (DOS). A key aspect of topography is slope. The slope aspect can influence the amount of sunlight fuels receive priming them for ignition. The degree of the slope can allow for a rapid rate of spread as a fire runs uphill or can slow a fires progression as it moves down slope. While topography is a large part in fire behavior, it is not a factor that can be readily changed and is generally out of a community's control.

4.3.4.2 History, Location, & Extent

Wildfires have been the cause for the five Proclaimed States of Emergency and Urban/Intermix Fires prompted three Proclaimed States of Emergency within the County of San Diego from 1950 to 2007 (County of San Diego, 2010, p. 4-43). Since Record keeping began in 1919, Valley Center has had 42 wildfires (Appendix C, Table C-5) within its boundaries and has been directly impacted by many more that have burned in the surrounding areas (Appendix D, Map D-19). Valley Center is susceptible to wildland fire throughout the community and is completely surrounded by high threats of wildland fire (Appendix D, Map D-18).

4.3.4.3 Probability of Future Events

Cal Fire Fire Resource and Assessment Program (FRAP) maps were utilized through the San Diego County GIS (San GIS) to profile the wildland fire hazard within Valley Center and the surrounding area. The FRAP map models take into consideration fuel, weather, topography, areas within the state that have frequent and severe fire regimes, and the production of fire embers which can spread the fire. The FRAP maps place Valley Center within Very High, High, and Moderate severity zones, with a majority falling within the Very High and Moderate severity zones. (Appendix D Map D-17)

The probability of wildland fire occurrence increases dramatically in the late summer and fall months when long dry periods have dried the vegetative fuel. Many times the dry weather is combined with a wind event that affects southern California known as "Santa Ana" winds (Foehn Winds). These winds, which originate inland to the East, can generate strong wind gusts that speed the rate of spread of wildland fire and make fire suppression activities extremely difficult or even impossible at times.

4.4 Asset Inventory

The following section describes the identification of assets that may be affected by a hazard event. Assets include buildings, population, critical facilities, and infrastructure. Due to the time constraints of the project and Valley Center's status as an unincorporated community of San Diego County, assets will be limited to pertinent facilities that are directly related to Valley Center through special districts or are necessary in emergency services. The assets identified are discussed below.

4.4.1 Population and Residential Stock

The population data for Valley Center was obtained from the U.S. Census 2009-2013 American Community Survey. The community's estimated population was 23,836.

Based upon the United State Census Bureau's 2013 American Community Survey Five Year Estimates, there were 8,868 housing units within Valley Center in 2013. The value of residential buildings is based upon an average of the county appraisers values, the comparative market analysis of the last six months within Valley Center, and the U.S. 2009-2013 American Community Survey Housing Characteristics. The value given to each residential unit was $460,000.

Table 4-4: Estimated Population and Residential Building Inventory

Population	Residential Buildings	
2013 American Community Survey Count	Total Residential Count	Total Value
23,836	8,868	$4,079,280,000

4.4.2 Critical Facilities

For the purpose of this LHMP, a critical facility is defined as a facility or aspect of a facility that provides essential services to the general public. This plan identified facilities within Valley Center that are key in preserving the quality of life within the community, emergency functions, and disaster recovery efforts. The County of San Diego generated the estimated exposure value for the 2010 Multi-Jurisdictional Hazard Mitigation Plan through the use of FEMA's HAZUS software. The estimated exposure values are an average of the cost of replacement after a disaster by square foot. Critical facilities and infrastructure are identified in Table 4-10.

Table 4-5: Critical Facilities and Infrastructure

Category	Facility	Location	Estimated Exposure Value Per Structure or Mile
Police and Fire Stations	Fire Station 1	28234 Lilac Road	$2,000,000
	Fire Station 2	28205 N. Lake Wolford Road	$2,000,000
	S.D. County Sheriff's Substation	28201 N. Lake Wolford Road	$2,000,000
Schools (Valley Center Pauma Unified School District)	Valley Center Primary	1429 Fruitvale Road	$1,000,000
	Valley Center Elementary School	28751 Cole Grade Road	$1,000,000
	Lilac School	30109 Lilac Road	$1,000,000
	Pauma School	33158 Cole Grade Road	$1,000,000
	Valley Center Middle School	28102 N. Lake Wolford Road	$1,000,000
	Oak Glen School	14172 W. Oak Glen Road	$1,000,000
	Valley Center High School	31322 Cole Grade Road	$1,000,000
Valley Center Municipal Water District	291 Miles of Water Lines	NA	$575,000
	7 Aqueduct Connections	NA	$250,000
	27 Pump Stations	NA	$661,500
	96 Pumps	NA	$29,950
	42 Reservoirs	NA	Unavailable

(Police, Fire, and School Source: County of San Diego, 2010, p. 4-60)
(VCMWD Source: J. Pugh, personal communication, March 13, 2014)

4.5 Vulnerability Assessment

This section includes an overview of the vulnerability assessment, methodology used, exposure analysis, and data limitations.

4.5.1 Overview of Vulnerability Assessment

The following are requirements for risk assessment as mandated by the DMA 2000:

- An overall summary of each hazard and its impact on the community.
- The identification of the types and numbers of existing buildings, infrastructure, critical facilities and, if possible, the types and number of future buildings, infrastructure, and critical facilities.
- Estimate of the potential dollar losses to vulnerable structures identified and a description of the methodology used to prepare estimates.

4.5.2 Methodology

With Valley Center's diverse topography and designation as an unincorporated community, data on population and residential data are not readily available. This plan utilized a border set forth by the Valley Center Fire Safe Council and has a total land area of 53,981 acres or 84.34 square miles. The border and land area differ greatly from the U.S. Census Designated Place. Due to this difference, a methodology was created based upon assumptions made by the student to determine population and residential density. These densities were then used to determine the population and residential structure at risk.

4.5.2.1 Methodology Process

Population Density Calculations:

$$Population \div Square\ Miles\ = Population\ Density$$

$$23{,}836\ persons\ \div 84.34\ square\ miles\ = 282.5\ people\ per\ square\ mile$$

Residential Density Calculations

$$Residential\ Units\ \ \div Square\ Miles\ = Residential\ Density$$

$$8{,}868\ residential\ units\ \div 84.34\ square\ miles\ = 105.15\ homes\ per\ square\ mile$$

With this calculation, the assumption was made that population and residential units were spread evenly throughout the community. With this assumption total acreage of each hazard was calculated and multiplied by population or residential densities to calculate the structures or population at risk.

4.5.3 Exposure Analysis

Table 4-6: Potential Vulnerability Assessment

Hazard	Methodology	Acreage	Square Miles	Population at Risk	Residential at Risk
Drought	Extreme Drought	53,981	84.35	23,836	8,868
Earthquake (Probabilistic Peak Ground Acceleration)	0.30-0.40	32,241	50.38	14,236	5,296
	0.40-0.50	14,747	23.04	6,512	2,423
	0.50-0.60	2,727	4.26	1,204	448
	0.60-0.70	4,072	6.36	1,798	669
	0.80-0.90	194	0.30	86	32
Flood	100-Year	548	0.86	242	90
	Dam Inundation	1,035	1.62	0	0
Fire	Moderate	21,989	34.36	9,710	3,612
	High	2,730	4.27	1,205	448
	Very High	29,262	45.72	12,921	4,807

Table 4-7: Potential Vulnerability Critical Infrastructure

Hazard	Methodology	Schools (7)	Police and Fire Stations (3)	VCMWD Pump Stations, (27)	VCMWD Reservoirs (42)	VCMWD Aqueduct Connection
Drought	Extreme Drought	7	3	27	42	7
Earthquake (Probabilistic Peak Ground Acceleration)	0.30-0.40	4	3	16	31	7
	0.40-0.50	2	0	10	2	0
	0.50-0.60	0	0	0	9	0
	0.60-0.70	0	0	1	0	0
	0.80-0.90	1	0	0	0	0
Flood	100-Year	1	0	0	0	0
	Dam Inundation	0	0	0		0
Fire	Moderate	4	0	12	19	2
	High	0	0	4	1	0
	Very High	3	3	10	22	5

Sources: All analysis for critical infrastructure, population, and residential units were completed through the analysis of maps and critical structure locations. Maps were gathered from the following sources: Drought: U.S. Drought Monitor California Map, Earthquake: San GIS PGA Maps, Flood: San GIS FEMA Map, Fire: San GIS Hire Hazard Severity Maps.

Note: The Valley Center Municipal Water District operates and maintains 291 miles of water lines throughout the district's service area. These lines are subject to earthquake hazards, but were not assessed within this plan. Maps of these lines are available upon request from the District.

4.5.3.1 Drought

With the prolonged periods of limited rainfall, drought has become a concern not only locally and in the County of San Diego of California, but also a concern of statewide importance. While the entirety of the population will be affected by drought, drought does not cause physical damage to the built environment. The hazard will be felt on the individual and departmental levels because water shortages create such impacts as agricultural crop damage, lack of water for fire fighting operations, and residential usage shortages.

4.5.3.2 Earthquakes

Earthquake risk within Valley Center is minimal with 87% of the population and 87% of residential falling within the probabilistic peak ground acceleration (PGA) of 0.30-0.40. The hazard presents itself similarly in regards to critical facilities, with 88% of all facilities being in the same category of 0.30-0.40 probabilistic peak ground acceleration.

"All buildings that have been built within recent decades must adhere to building codes that require them to be able to withstand earthquake magnitudes that create a PGA of 0.4 or greater" (County of San Diego, 2010, p. 4-25). The following table is the break down of the total residential structures and the years they were constructed.

Table 4-8: Construction Years of Residential Structure in Valley Center

Year Structure was Built	Number of Housing Units	Percentage of Total Housing Units
2010 or later	20	0.2%
2000-2009	1,980	22.3%
1990-1999	1,415	16.0%
1980-1989	2,566	28.9%
1970-1979	1,781	20.1%
1960-1969	553	6.2%
1950-1959	254	2.9%
1949 and prior	299	3.3%
Total	**8,868**	**100%**

4.5.3.3 Floods

The risk of floods within Valley Center is minimal with 548 acres and approximately 1% of the total land area being within the 100-year floodplain. Based upon the assumptions previously stated, there are 242 people, 90 residential buildings, and no critical facilities at risk.

Flooding by dam inundation is minimal with 1,035 acres of land area being at risk for this hazard. The land uses within this hazard area are open space, parks and agriculture. Based upon the land use and the hazard, there is no population, residential structures, or critical facilities at risk.

Note: The acreage found to be within the 100-year floodplain is significantly lower than what was stated in the 2011 San Diego County General Plan Update Environmental Impact Report, Section 2.8 Hydrology and Water Quality, which determined that the community of Valley Center has 1,134 acres within the 100-year floodplain.

4.5.3.4 Wildland Fire

Wildfire is the largest hazard facing Valley Center with the entirety of the community being classified as Moderate, High, or Very High hazard level. This places the entire population, residential units, and critical facilities within these hazard categories.

Chapter 5
Mitigation Methods

5.1 Mitigation Goals and Objectives

Based upon the findings of the vulnerability analysis and input from the planning team meetings, the student determined the following mitigation goals and strategies:

- Goals: A general statement of what would like to be achieved in the long-run within Valley Center.

- Objective: A statement detailing how the community will reach the identified goal, specifically in the terms of strategies or implementation methods.

- Actions: Detailed measures explaining the details of how the objective is carried out.

5.2 Overview of Mitigation Goals, Objectives, and Actions

Listed below are the community of Valley Center's specific hazard mitigation goals, objectives, and the related action measures. For each goal an objective has been identified with multiple action measures that correlate. These action measures are time based as short-term (1-3 years), moderate (3-5 years), and long-term goals (5+ years).

Goal 1
Reduce the potential for economic damage from drought.

Objective 1.A Develop a comprehensive approach to protect existing and future assets and population from drought.

Action 1.A.1 Continue to enhance current water system to ensure redundancies within the system to allow for leak isolation and continued service.

Action 1.A.2 Continue public education and outreach to address water conservation methods.

Action 1.A.3 Promote and create incentives for new development to be designed to limit water usage and reuse water on site.

Action 1.A.4 Develop an incentive program to promote water conservation techniques for all customers within the water district.

Action 1.A.5 Implement mandatory water restrictions upon residential water users to conserve water for agricultural use.

Goal 2
Reduce the potential for loss of life, injury, and economic damage from earthquake events.

Objective 2.A Develop a comprehensive approach to protect existing and future assets and population from earthquakes.

Action 2.A.1 Continue to enforce building standards set forth by the California building code regarding seismic requirements.

Action 2.A.2 Continue to improve upon the water distribution system to reduce impacts of earthquakes, including the installation of seismic valves at critical water storage tanks.

Action 2.A.3 Develop pre-incident plans for areas that are at high ground shaking probability in the event of an earthquake.

Goal 3

Reduce the potential for loss of life, injury, and economic damage from flood events.

Objective 3.A Develop a comprehensive approach to protect existing and future assets and population from floods.

Action 3.A.1 Continue to identify flood prone areas utilizing GIS.

Action 3.A.2 Develop pre-incident action plans for areas identified as flood prone.

Action 3.A.3 Require that new development include hydrological and floodplain analysis within or adjacent to an identified floodplain.

Goal 4

Reduce the potential for loss of life, injury, and economic damage from wildland fire events.

Objective 4.A Develop a comprehensive approach to protect existing and future assets and population from wildland fire.

Action 4.A.1 Continue to enforce standardized Defensible Space Clearance distances.

Action 4.A.2 Continue to ensure that all construction and construction materials are compliant with current fire and building codes.

Action 4.A.3 Continue and increase public outreach and education to address fire prevention and mitigation efforts.

Action 4.A.4 Conduct a fuel management study throughout the VCFPD to ensure service levels and resource allocation.

Action 4.A.5 Develop and implement a fire sprinkler ordinance in accordance with Cal Fire Residential Fire Sprinkler Code and create thresholds, which require existing structures to be retrofitted with fire sprinklers.

Table 5-1: Action Plan

Action Number	Action Item	Dept.	Term
Action 1.A.1	Continue to enhance current water system to ensure redundancies within the system to allow for leak isolation and continued service.	VCMWD	Short
Action 1.A.2	Continue public education and outreach to address water conservation methods.	VCMWD	Short
Action 1.A.3	Promote and create incentives for new development to be designed to limit water usage and reuse water on site.	VCMWD	Moderate
Action 1.A.4	Develop an incentive program to promote water conservation techniques for all customers within the water district.	VCMWD	Moderate
Action 1.A.5	Implement mandatory water restrictions upon residential water users to conserve water for agricultural use.	VCMWD	Moderate
Action 2.A.1	Continue to enforce building standards set forth by the California building code regarding seismic requirements.	County of San Diego	Short
Action 2.A.2	Continue to improve upon the water distribution system to reduce impacts of earthquakes, including the installation of seismic valves at critical water storage tanks.	VCMWD	Short
Action 2.A.3	Develop pre-incident plans for areas that are at high ground shaking probability in the event of an earthquake.	VCFPD	Moderate
Action 3.A.1	Continue to identify flood prone areas utilizing GIS.	County of San Diego	Short
Action 3.A.2	Develop pre-incident action plans for areas identified as flood prone.	VCFPD	Moderate
Action 3.A.3	Require that new development include hydrological and floodplain analysis within or adjacent to an identified floodplain.	County of San Diego	Moderate
Action 4.A.1	Continue to enforce standardized Defensible Space Clearance distances.	VCFPD	Short
Action 4.A.2	Continue to ensure that all construction and construction materials are compliant with current fire and building codes.	VCFPD	Short
Action 4.A.3	Continue and increase public outreach and education to address fire prevention and mitigation efforts.	VCFPD	Short
Action 4.A.4	Conduct a fuel management study throughout to ensure service levels and resource allocation.	VCFPD	Moderate
Action 4.A.5	Develop and implement a fire sprinkler ordinance in accordance with Cal Fire Residential Fire Sprinkler Code and create thresholds, which require existing structures to be retrofitted with fire sprinklers.	VCFPD	Long

Chapter 6
Plan Maintenance

6.1 Overview of Plan Maintenance

The DMA 2000 requires that all plans shall include a section describing the methods and schedule for monitoring, evaluating, and updating the plan, as well as public involvement. Since this plan was created as a senior academic project and has no formal adopting body, the following section is written as suggested actions to ensure that if modified or adopted in the future, actions are set forth to guide the plan maintenance process. The following three steps will make certain that the LHMP will be an effective and applicable document:

- Monitoring, evaluating, and updating the Valley Center LHMP
- Implementation through existing planning mechanisms
- Continued public involvement

6.2 Monitoring, Evaluating and Updating the LHMP

Upon adoption of this plan by a formal agency, the agency should create a disaster oversight committee which is comprised of the original planning team and additional individuals such as, applicable stakeholders, governmental agencies, and political authorities to be responsible for monitoring, evaluating, and updating the plan. With Valley Center being in the unincorporated portion of San Diego County, the County should be the main point of contact and should coordinate all efforts associated with the LHMP.

Annually the disaster oversight committee will conduct a review of the plan, primarily Chapter 5 Goals, Objectives, and Actions to ensure that the mitigation efforts developed are still relevant and effective for the Valley Center community. This review should be interdisciplinary and draw on information from all participating parties. This review will be used as a basis for any updates that are required and any possible changes that must be made, such as refocusing on new or increasingly high hazard risks, adjusting to community growth, incorporating additional agency involvement, or identifying shortcomings of the plan. The County should implement the review and based upon the approval of the disaster oversight committee, the County should adopt any changes to the LHMP.

6.3 Implementation Through Existing Mechanisms

The plan should be implemented through any relevant existing plans or policies and shall be ensured by the disaster oversight committee. Relevant plans and policies include:

- *The San Diego County General Plan*
- *The San Diego County Multi-Jurisdictional Hazard Mitigation Plan*
- *The Valley Center Community Plan*
- *The Valley Center Land Use Map*
- *The Valley Center Design Guidelines*
- *The Greater Valley Center Community Wildfire Protection Plan*

6.4 Continued Public Involvement

While this student developed plan did not include public participation or public comment, the DMA 2000 requires public involvement in all steps of the hazard planning process. Upon consideration of the plan for adoption by a governmental agency, public comment and input should be actively sought. Hard copies of the plan should be provided to all public agencies and the document should be made accessible online. Contact information should be given for community members to voice opinions or concerns regarding the LHMP.

After adoption, the LHMP should remain available to the public. The annual review of the plan shall incorporate public involvement, with all comments and concerns being taken into account by the disaster oversight committee when evaluating the effectiveness of the plan and considering any necessary changes.

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Valley Center Municipal Water District. (2015). Fact Sheet. Retrieved January 10, 2015, from Valley Center Municipal Water District: http://www.vcmwd.org/en/About%20Us/Fact%20Sheet.aspx

Valley Center Municipal Water District. (2011, July). Urban Water Management Plan 2010 Update. Retrieved January 3, 2015, from Valley Center Municipal Water District: http://www.vcmwd.org/pdf/Valley%20Center%20MWD%202010%20UWMP%20Update.pdf

Valley Center Pauma Unified School District. (2014). Our District. Retrieved January 20, 2015, from VCPUSD: https://vcpusd.haikulearning.com/davis.st/ourdistrict/cms_page/view

Valley Center Times Advocate. (2014). 2014 VCPUSD Bus Schedules. Retrieved January 16, 2015, from Valley Center Times Advocate: http://www.valleycentertimesadvocate.com/2014-vcpusd-bus-schedule

Appendix A

Beyond the Basics

This plan, as stated in the Introduction, was created as a capstone senior project by Haydne Shimer, who studied City and Regional Planning at California Polytechnic State University San Luis Obispo. The plan was based upon the website *Beyond the Basics* (http://mitigationguide.org), a website created to assist local governments in creating or updating LHMP in accordance with guidelines set forth by FEMA. The following is a critique of the website based upon the student's experience.

Beyond the Basics is formatted into three different sections including: an Introduction, nine Tasks, and a Tools Section. These sections allow communities to go through step-by-step learning about the hazard planning process and what is needed to develop a plan that best fits their community. The Introduction is an overview of what hazard planning is, examples of what hazard planning prepares for, and an overview of guiding principles when preparing a plan. The nine Tasks are the majority of the site, which break down the steps that need to be followed in order to complete the plan. Each task includes sub-tasks that further break down the task to ensure it is completed correctly. The final Tools Section includes worksheets, example plans, tools, and additional resources to allow the user to base their work upon or further explore hazard planning.

This site was extremely valuable to the creation of this plan. Since this plan is an academic project and the first plan of this type created by the student, this site sets the framework for how to create such a plan. One of the largest hurdles the student faced was the question: Where do I begin? Getting started was the largest challenge due to the sheer complexity of this LHMP. After researching LHMPs and problems that cities face, the student found that many plans are not nearly as successful as they could be. Many plans are either too overreaching or too specific causing the primary goal of reducing overall risk to the community to be lost or not feasible. This is why *Beyond the Basics* was so useful; it shows the user how to take the plan process one step at a time and generate a plan that is achievable. It, in a sense, slows down the planning process to a steady meticulous pace where specific details of the plan can be formulated and designed to meet a community's needs.

While the site was valued greatly by the student and is an excellent resource for any group or agency setting out to create a plan, the student found that the site was designed in regards to regionally specific hazards. With the site being designed through cooperation of several east coast based agencies and academic institutes, many of the examples given on the site and best practices have to do with hazards that are more prevalent in this portion of the country, such as coastal flooding and storm surges. While these examples are hazards that occur throughout the country, this LHMP was more concerned with threats such as wildland fire and earthquakes. If this website were to be expanded, the student recommends additional examples of other hazards such as wildland fire or drought, so that the site can be an even more fitting tool for agencies nationwide.

Overall this site is a valuable resource and is highly recommended to any organization that is looking to update or create a new hazard plan. The site is also an exceptional educational tool

for students and professionals to learn about the hazard mitigation process and how hazard planning can better communities.

Beyond the Basics Website Contents Break Down

Introduction

Task1: Determine the Planning Area and Resources

- Overview
- Establish a Planning Area
- Multi-Jurisdictional Plan Coordination
- Leading the Planning Process & Technical Assistance
- Conclusion

Task 2: Building the Planning Team

- Overview
- Identify Planning Team Members
- Engage Local Leadership
- Promote Participation and Buy-In
- Initial Steps for the Planning Team
- Multi-Jurisdictional Planning Team
- Documentation of the Planning Process- Planning Team
- Conclusion

Task 3: Create an Outreach Strategy

- Overview
- Outreach Strategy
- How to Develop Your Outreach Strategy
- Continue Public Outreach Over Time
- Coordinating a Multi-Jurisdictional Planning Strategy
- Documentation of the Planning Process- Stakeholder and Public Involvement
- Conclusion

Task 4: Review Community Capabilities

- Overview
- Capability Assessment
- Types of Capabilities
- National Flood Insurance Program
- Documentation of Community Capabilities
- Conclusion

Task 5: Conduct a Risk Assessment

- Overview
- Defining Risk Assessment
- Steps to Conduct a Risk Assessment
- Documentation of Risk Assessment
- Conclusion

Task 6: Develop Mitigation Strategies

Overview
The Mitigation Strategy: Goals Objectives, Actions, Action Plan
Mitigation Goals
Types of Mitigation Actions
Selecting Mitigation Actions
Action Plan for Implementation
Updating the Mitigation Strategy
Communicating the Mitigation Action Plan
Conclusion

Task 7: Keep the Plan Relevant

Overview
Plan Maintenance Procedures
Continue Public Involvement
Conclusion

Task 8: Review and Adopt the Plan

Overview
Local Plan Review
Local Adoption of the Plan
State and FEMA Plan Review
Additional Considerations
Celebrate Success

Task 9: Create a Safe and Resilient Community

Overview
Challenges to Achieving Mitigation Goals
Recommendations for Success
Funding and Assistance
Conclusion

Worksheets
Example Plans
Research
Resources

Appendix B

Table B-1: VCMWD Connections by Customer Classification

Customer Classification	Historical Connections by Year		
	1990	**1995**	**2000**
Single Family	3,650	4,640	5,135
Multi-Family	54	98	96
Commercial	184	149	290
Industrial	0	0	0
Institutional/Gov.	11	18	27
Landscape/ Recreation	0	0	0
Agricultural	2,105	1,489	1,696
Other	0	0	41
Total	**6,004**	**6,394**	**7,285**

(Source: Valley Center Municipal Water District, 2011, p. 3-3)

Table B-2: Water Deliveries for 2005, Acre Feet per Year

	2005				
	Metered		**Unmetered**		**Total**
Water Use Sectors	**No. of Accounts**	**Deliveries ac-ft./yr.**	**No. of Accounts**	**Deliveries ac-ft./yr.**	**Volume ac-ft./yr.**
Single Family	6,380	5,844	-	0	5,844
Multi-Family	109	472	-	0	472
Commercial	217	1,258	-	0	1,258
Industrial	0	0	-	0	0
Institution/Gov.	27	185	-	0	185
Landscape	0	0	-	0	0
Agriculture	1,725	28,020	-	0	28,020
Other	135	311	-	0	311
Total Water Use	**8,593**	**36,090**	**0**	**0**	**36,090**

(Source: Valley Center Municipal Water District, 2011, p. 3-4)

Table B-3: Water Deliveries for 2010, Acre Feet per Year

	2010				
	Metered		Unmetered		Total
Water Use Sectors	**No. of Accounts**	**Deliveries ac-ft./yr.**	**No. of Accounts**	**Deliveries ac-ft./yr.**	**Volume ac-ft./yr.**
Single Family	7,609	5,740	-	0	5,740
Multi-Family	235	178	-	0	178
Commercial	371	2,089	-	0	2,089
Industrial	0	0	-	0	0
Institution/Gov.	32	137	-	0	137
Landscape	0	0	-	0	0
Agriculture	1,378	19,666	-	0	19,666
Other	63	27	-	0	27
Total Water Use	**9,698**	**27,837**	**0**	**0**	**27,837**

(Source: Valley Center Municipal Water District, 2011, p. 3-3)

Table B-4: Projected Water Deliveries for 2015, Acre Feet per Year

	2015				
	Metered		Unmetered		Total
Water Use Sectors	**No. of Accounts**	**Deliveries ac-ft./yr.**	**No. of Accounts**	**Deliveries ac-ft./yr.**	**Volume ac-ft./yr.**
Single Family	7,176	7,262	-	0	7,262
Multi-Family	114	498	-	0	498
Commercial	514	2,686	-	0	2,686
Industrial	-	0	-	0	0
Institution/Gov.	38	165	-	0	165
Landscape	-	0	-	0	0
Agriculture	1,419	20,733	-	0	20,733
Other	29	15	-	0	15
Total Water Use	**9,290**	**31,359**	**0**	**0**	**31,359**

(Source: Valley Center Municipal Water District, 2011, p. 3-7)

List B-1: Complete List of Soil Types Found within Valley Center by Series:

Anderson Series
- Anderson Very Gravelly Sandy Loam

Arlington Series
- Arlington Course Sandy Loam

Bonsall Series
- Bonsall Sandy Loam

Cieneba Series
- Cieneba Fallbrook Rocky Sandy Loam
- Cieeneba Rocky Course Sandy Loam
- Cieneba Rocky Course Sandy Loam
- Cieneba Very Rocky Course Sandy Loam

Escondido Series
- Escondido Very Fine Sandy Loam

Fallbrook Series
- Fallbrook Vista Sandy Loams
- Fallbrook Rocky Sandy Loam
- Fallbrook Sandy Loam

Friant Series
- Friant Rocky Fine Sandy Loam

Greenfield Series
- Greenfield Sandy Loam

Las Posas Series
- Las Posas Fine Sandy Loam
- Las Posas Stony Fine Sandy Loam

Placentia Series
- Placentia Sandy Loam

Ramona Series
- Ramona Gravelly Sandy Loam
- Ramona Sandy Loam

Tujunga Series
- Tujunga Sand
- Tujunga Sandy Loam

Visalia Series
- Visalia Sandy Loam

Vista Series
- Vista Course Sandy Loam
- Vista Rocky Course Sandy Loam

Appendix C

Table C-1: Drought Classifications

Drought Category	Description	Possible Impacts
D0	Abnormally Dry	Going into drought: Short-term dryness slowing planting and crops and pastures. Coming out of drought: some lingering water deficiencies with crops and pastures not fully recovered.
D1	Moderate Drought	Some damage to crops and pastures. Water shortages developing. Voluntary water-use restrictions requested.
D2	Severe Drought	Crop and pasture loss likely. Water shortages common. Water restrictions imposed.
D3	Extreme Drought	Major crop and pasture losses. Widespread water shortages or restrictions.
D4	Exceptional Drought	Exceptional and widespread crop and pasture losses. Shortage of water in reservoirs, streams, and wells creating water emergencies.

(Source: United States Drought Monitor, 2015)

Table C-2: Richter Scale Rating and Effects of Earthquake

Richter Magnitudes	Earthquake Effects
Less than 3.5	Generally not felt, but recorded.
3.5-5.4	Often felt, but rarely causes damage.
5.5-6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1-6.9	Can be destructive in areas up to 100 kilometers across.
7.0-7.9	Major earthquake. Can cause serious damage over larger areas.
8 or greater	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

(Source: United States Geological Survey, 2012)

Table C-3: Magnitude Intensity Comparison

Magnitude	Typical Maximum Modified Mercalli Intensity
1.0-3.0	I
3.0-3.9	II-III
4.0-4.9	IV-V
5.0-5.9	VI-VII
6.0-6.9	VII-IX
7.0 and higher	VIII or higher

(Source: United States Geological Survey, 2014)

Table C-4: Modified Mercalli Intensity Scale

MMI Value	Description of Shaking Severity	Summary Damage Description	Full Description
I			Not felt except by a very few.
II			Felt only by a few persons.
III			Felt quite noticeably by persons indoors; similar to the passing of a truck.
IV			Felt indoors by many, outdoors. Standing automobiles rock noticeably.
V	Light	Pictures Move	Felt by nearly everyone; many awakened. Windows broken, pendulum clocks may stop.
VI	Moderate	Objects Fall	Felt by all, many frightened. Some heavy furniture moved; damage slight.
VII	Strong	Nonstructural Damage	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built structures; some chimneys broken.
VIII	Very Strong	Moderate Damage	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures.
IX	Very Violent	Extreme Danger	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
X			Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
XI			Few, if any structures remain standing. Bridges destroyed. Rails bent greatly.
XII			Damage total. Lines of sight and level are distorted.

(Source: United States Geological Survey, 2014)

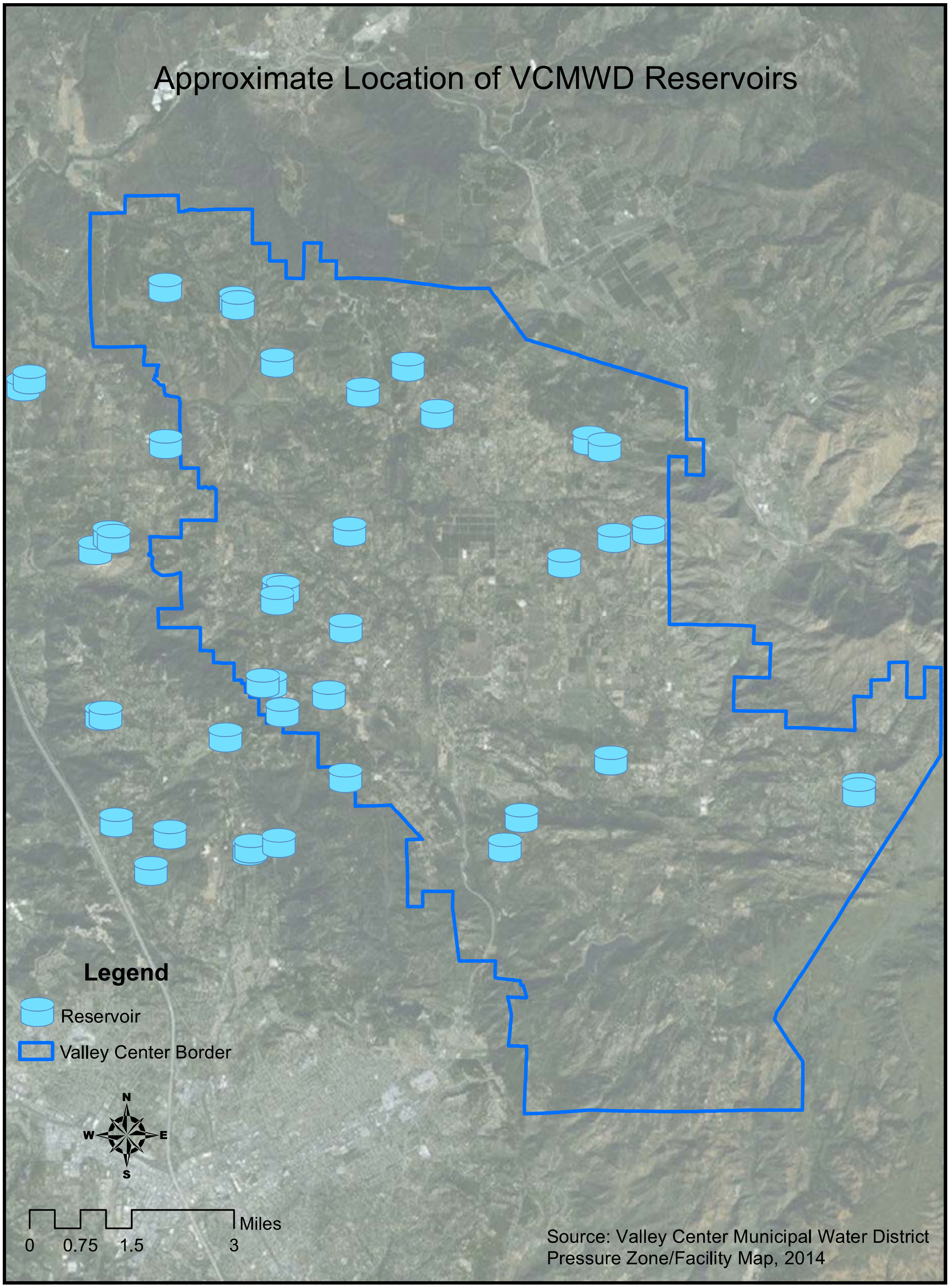
Table C-5: Historic Fires In Valley Center

Fire	Date	Acres Burned
Unnamed	1919	8,653
Unnamed	1926	298
Unnamed	1927	142
Unnamed	1927	47
Unnamed	1938	2,293
Unnamed	1943	690
Unnamed	1945	1,129
Unnamed	1946	169
Unnamed	1946	341
Unnamed	1947	3,335
Unnamed	1949	1,873
Guejito	September 1950	8,025
Unnamed	1953	9,226
Couser	August 1953	415
Oakvale Lodge	September 1955	8,198
ROSE	August 1956	4,841
Lake Wohlford	September 1956	439
Moosa	September 1956	599
Melrose	September 1956	505
Bear Ridge	July 1962	1,855
Moosa	August 1969	6,944
Lilac	September 1970	2,083
Unnamed	1975	321
Unnamed	1975	30
Vesper	June 1979	402
Wohlford	August 1981	40
Paradise	September 1984	117
Grade	October 1987	2,748
Cole	November 1988	32
Bottle Peak	November 1989	213
Paradise	October 1993	44
Guejito	October 1993	17,820
Grade	November 1995	161
Rincon	October 1996	1,984
Wohlford	August 1997	538
Pamossa	September 1997	12
Canal	October 1999	82
Paradise	October 2003	56,546
Grade	July 2003	12
Cole Grade	March 2004	8
Poomacha	October 2007	49,411
Witch	October 2007	162,070

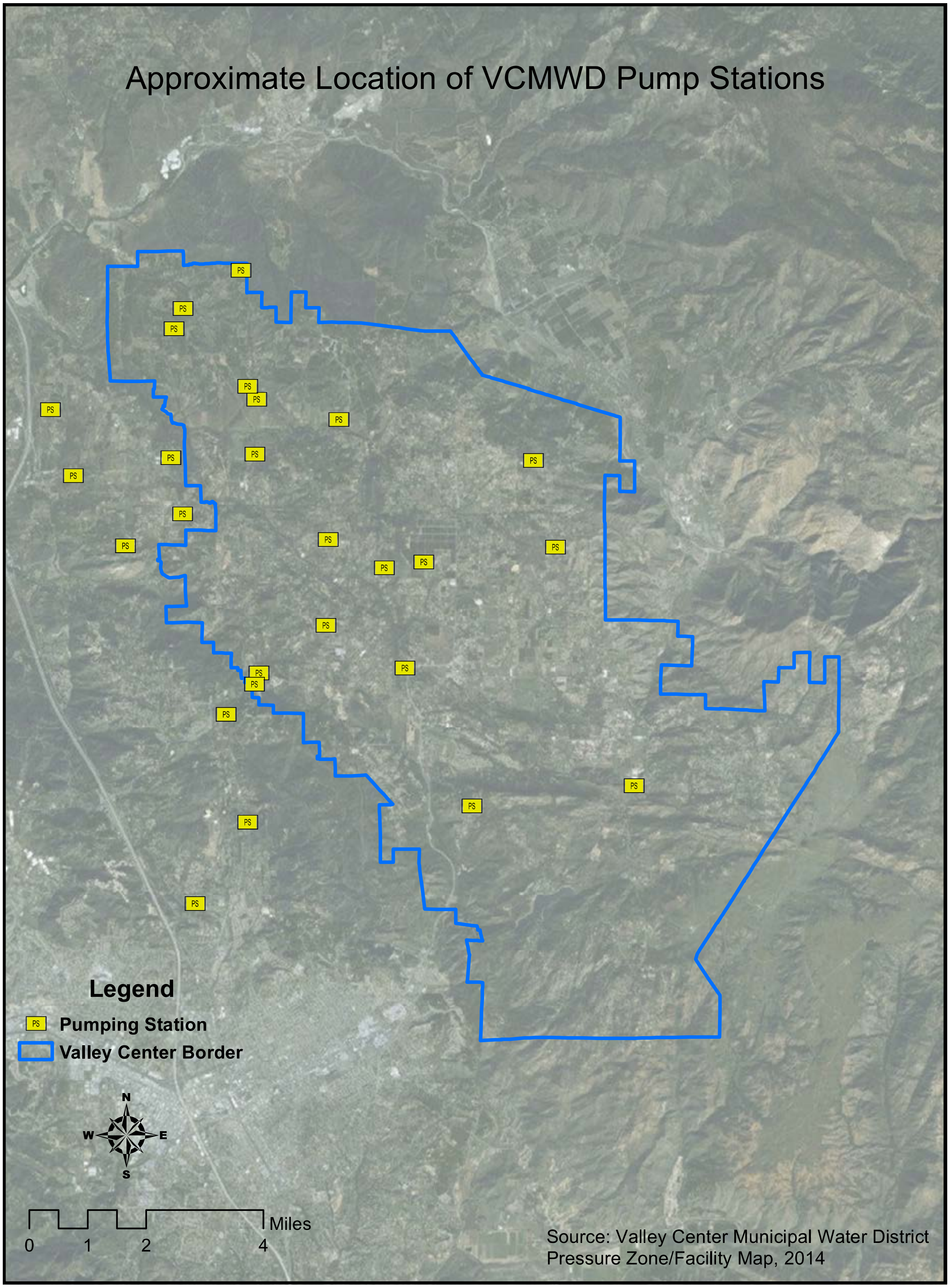
Appendix D

Map D-1

Map D-2

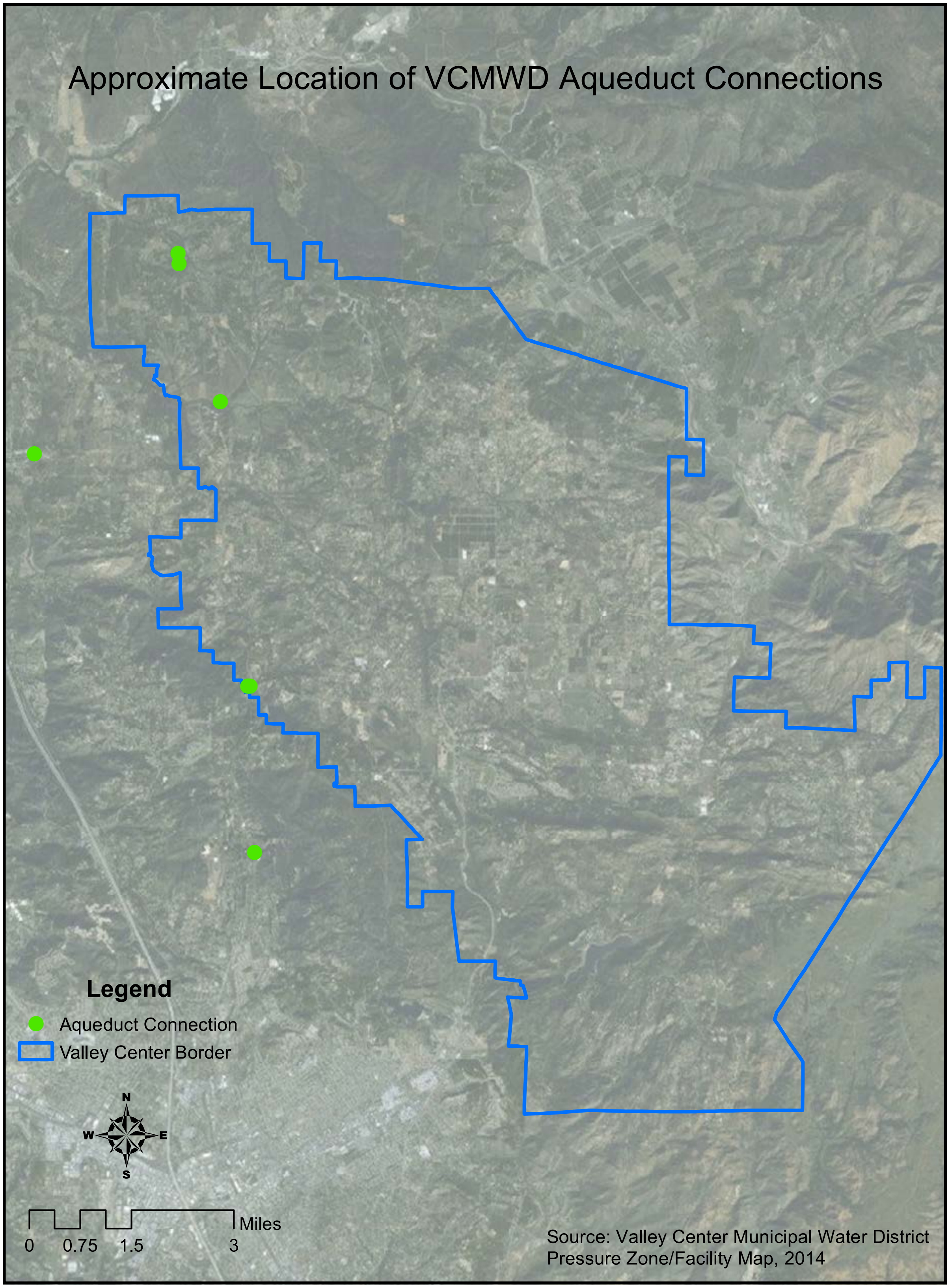

Approximate Location of VCMWD Reservoirs
Legend
Reservoir
Valley Center Border
N
W
E
S
Miles
0
0.75
1.5
3
Source: Valley Center Municipal Water District
Pressure Zone/Facility Map, 2014

Map D-3

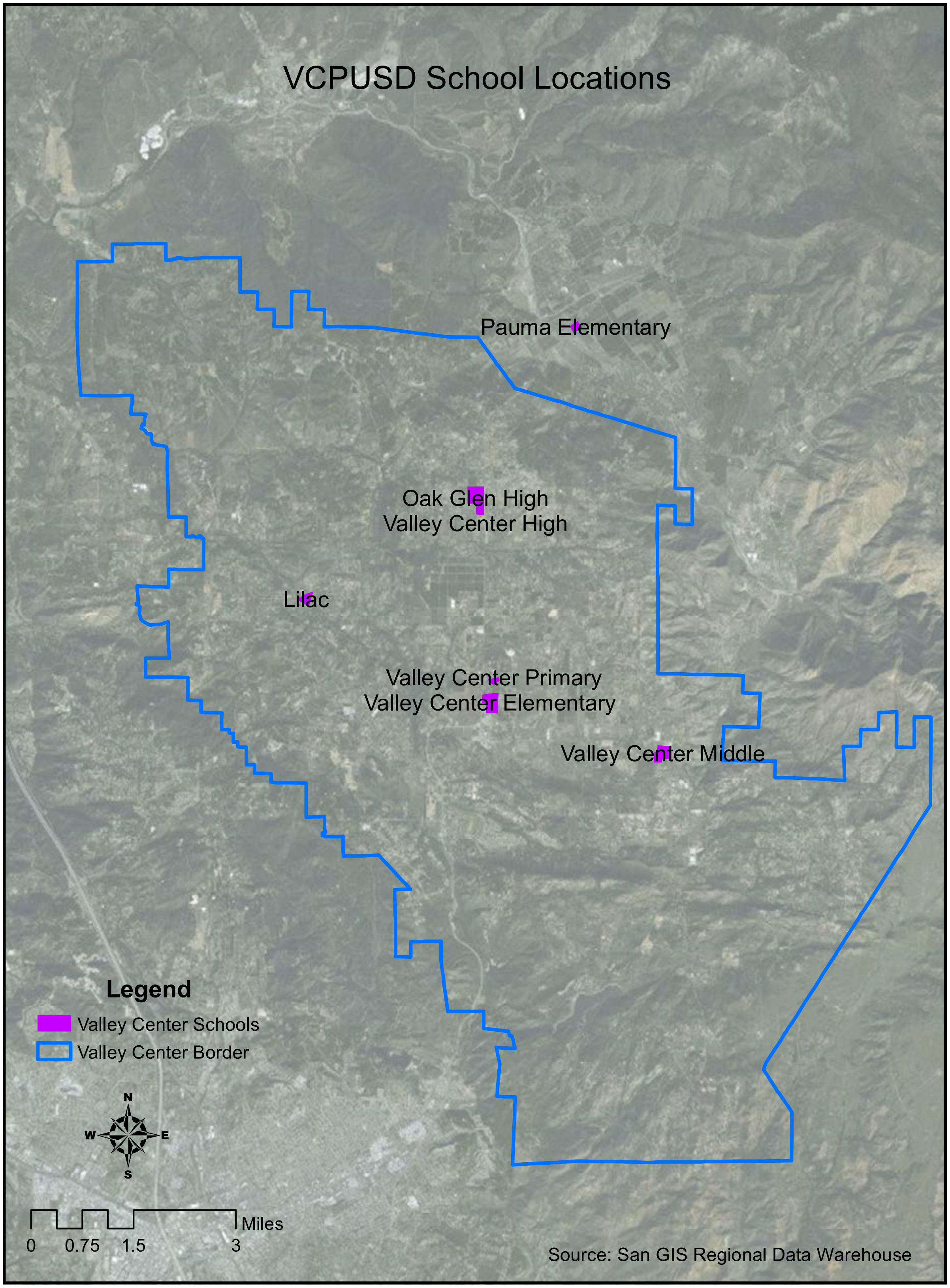


Approximate Location of VCMWD Pump Stations
Legend
PS
Pumping Station
Valley Center Border
N
W
E
S
0
1
2
4
Miles
Source: Valley Center Municipal Water District
Pressure Zone/Facility Map, 2014

Map D-4

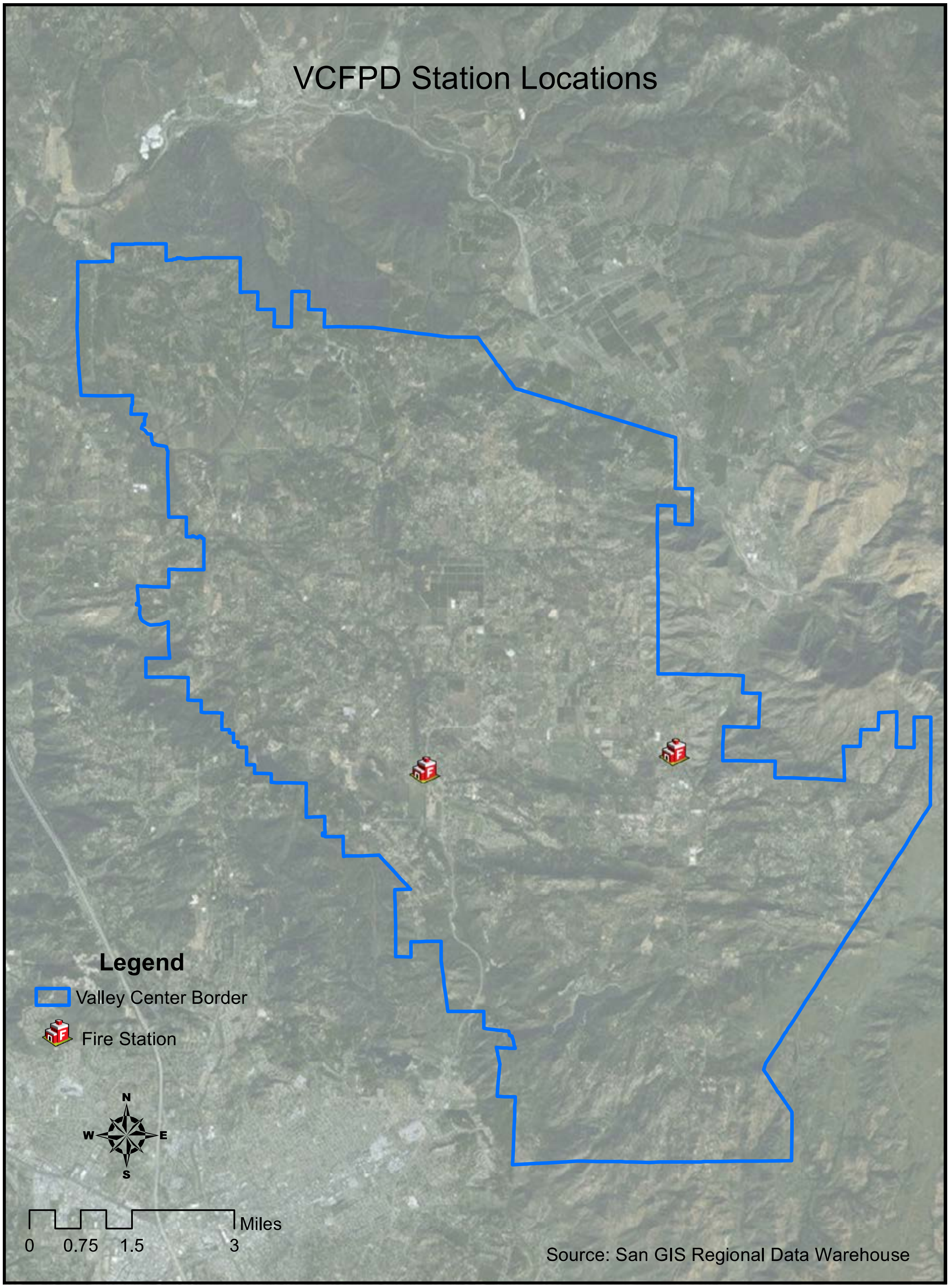

Approximate Location of VCMWD Aqueduct Connections
Legend
Aqueduct Connection
Valley Center Border
N
W
E
S
Miles
0
0.75
1.5
3
Source: Valley Center Municipal Water District
Pressure Zone/Facility Map, 2014

Map D-5

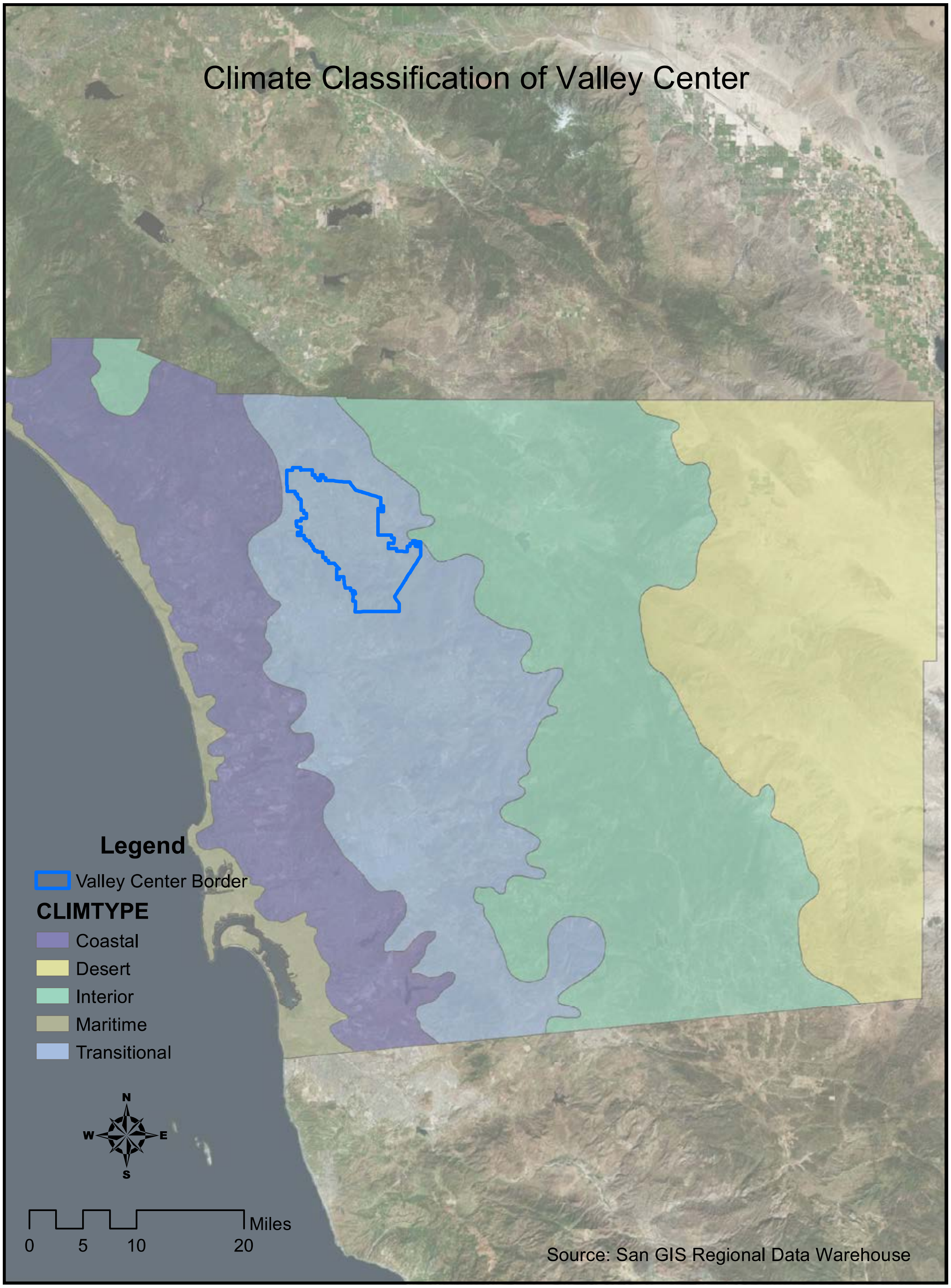


VCPUSD School Locations
Pauma Elementary
Oak Glen High
Valley Center High
Lilac
Valley Center Primary
Valley Center Elementary
Valley Center Middle
Legend
Valley Center Schools
Valley Center Border
N
W
E
S
0
0.75
1.5
3
Miles
Source: San GIS Regional Data Warehouse

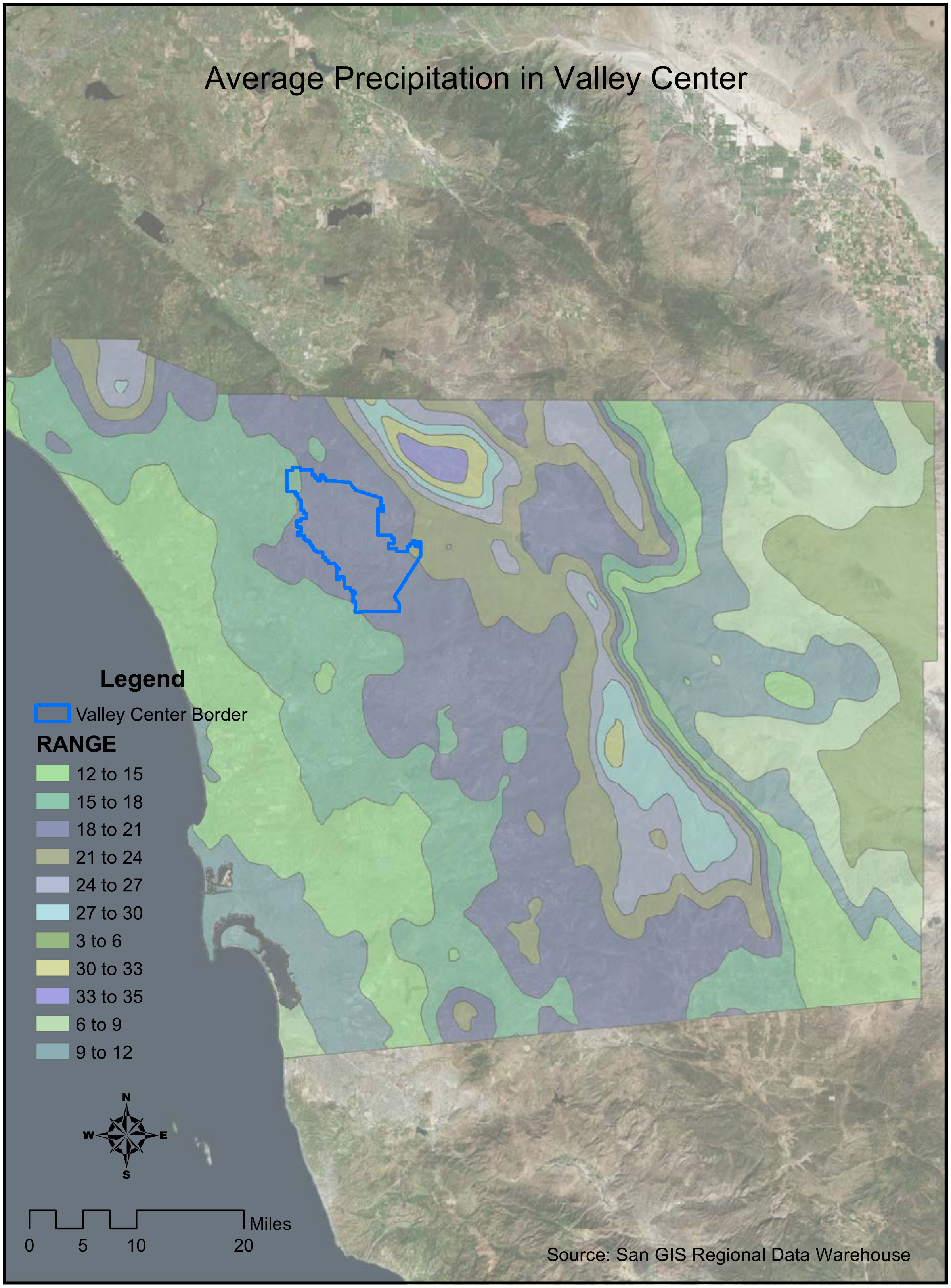
Map D-6


VCFPD Station Locations
Legend
Valley Center Border
Fire Station
N
W
E
S
0
0.75
1.5
3
Miles
Source: San GIS Regional Data Warehouse

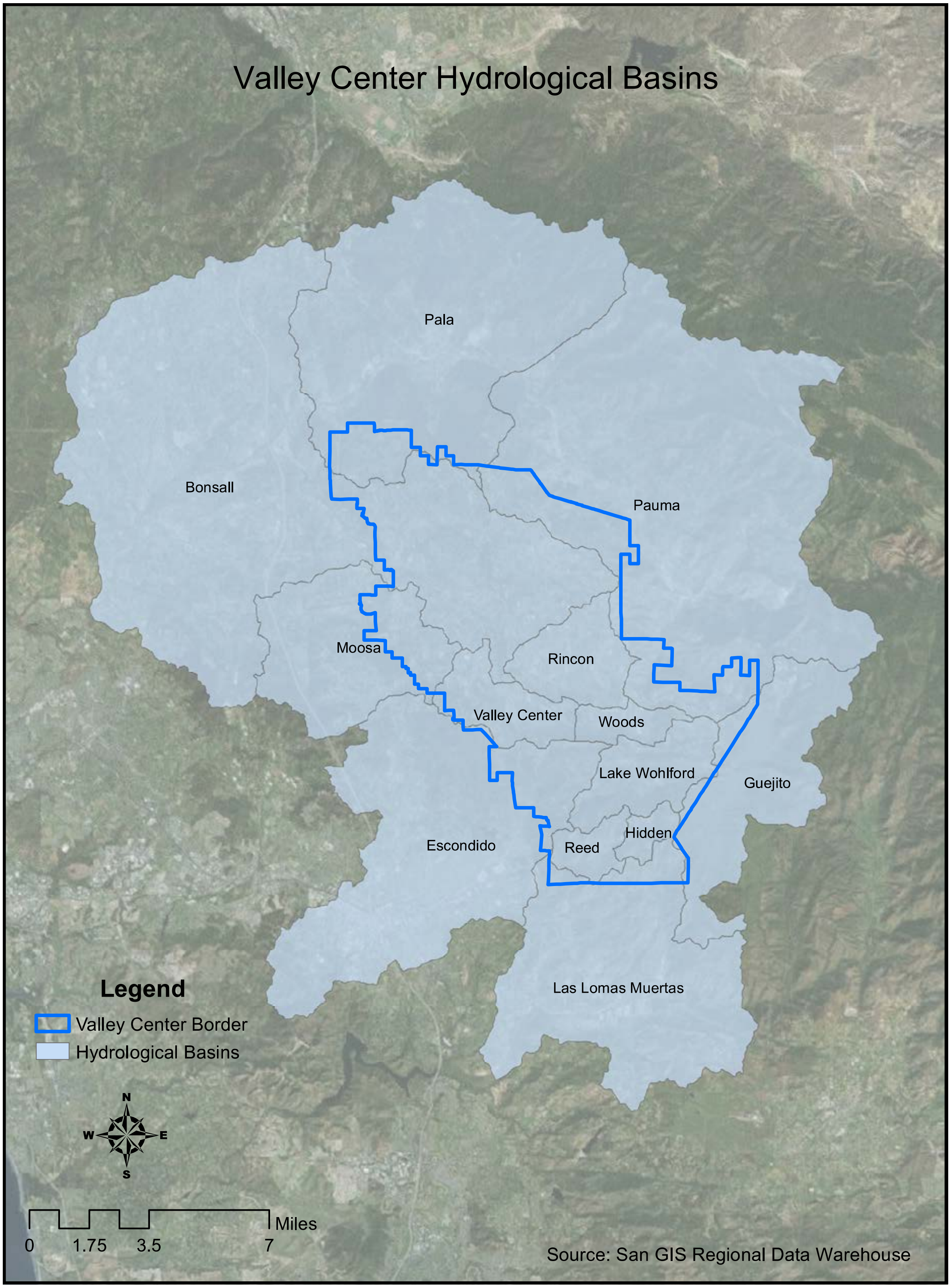
Map D-7


Climate Classification of Valley Center
Legend
Valley Center Border
CLIMTYPE
Coastal
Desert
Interior
Maritime
Transitional
N
W
E
S
0
5
10
20
Miles
Source: San GIS Regional Data Warehouse

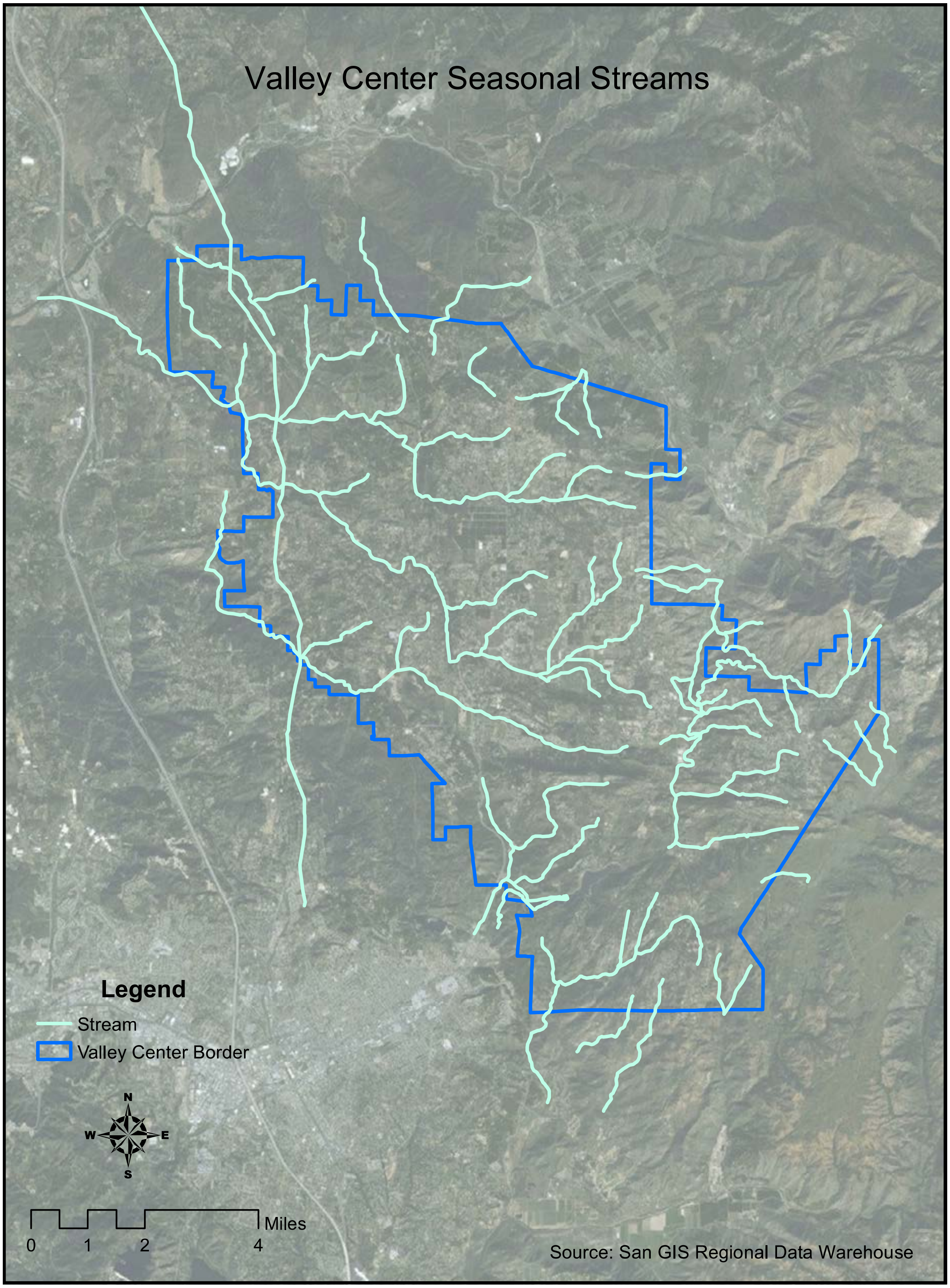
Map D-8


Average Precipitation in Valley Center
Legend
Valley Center Border
RANGE
12 to 15
15 to 18
18 to 21
21 to 24
24 to 27
27 to 30
3 to 6
30 to 33
33 to 35
6 to 9
9 to 12
N
W
E
S
Miles
0
5
10
20
Source: San GIS Regional Data Warehouse

Map D-9


Valley Center Hydrological Basins
Pala
Bonsall
Pauma
Moosa
Rincon
Valley Center
Woods
Lake Wohlford
Guejito
Hidden
Reed
Escondido
Las Lomas Muertas
Legend
Valley Center Border
Hydrological Basins
N
W
E
S
Miles
0
1.75
3.5
7
Source: San GIS Regional Data Warehouse

Map D-10

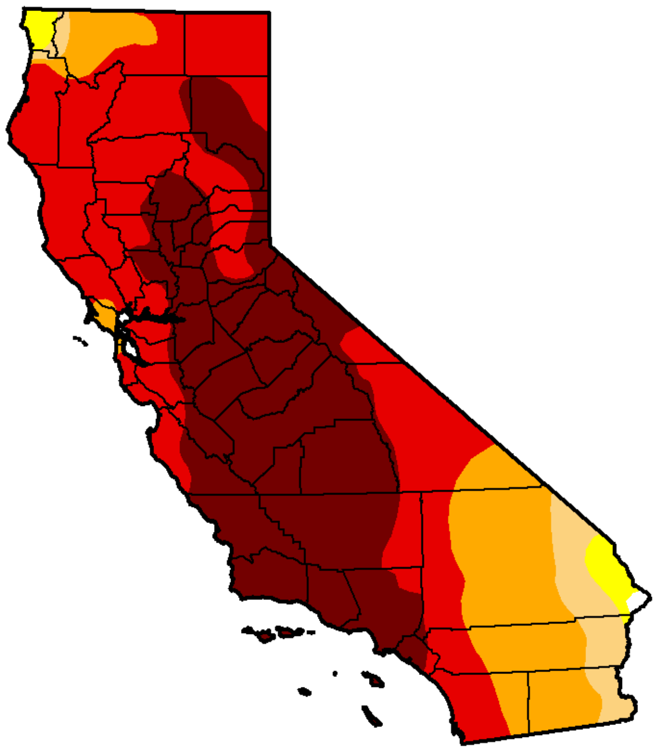

Valley Center Seasonal Streams
Legend
Stream
Valley Center Border
N
W
E
S
0
1
2
4
Miles
Source: San GIS Regional Data Warehouse

Map D-11


Valley Center Watersheds
SAN LUIS REY
CARLSBAD
SAN DIEGUITO
Legend
Valley Center Border
Watersheds
N
W
E
S
Miles
0
3.75
7.5
15
Source: San GIS Regional Data Warehouse

Map D-12

U.S. Drought Monitor
California



February 3, 2015

(Released Thursday, Feb. 5, 2015)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	0.16	99.84	98.13	93.57	77.46	39.99
Last Week *1/27/2015*	0.00	100.00	98.13	94.34	77.52	39.99
3 Months Ago *11/4/2014*	0.00	100.00	99.71	94.42	79.69	55.08
Start of Calendar Year *12/30/2014*	0.00	100.00	98.12	94.34	77.94	32.21
Start of Water Year *9/30/2014*	0.00	100.00	100.00	95.04	81.92	58.41
One Year Ago *2/4/2014*	1.43	98.57	94.18	89.91	67.13	9.81

Intensity:

- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

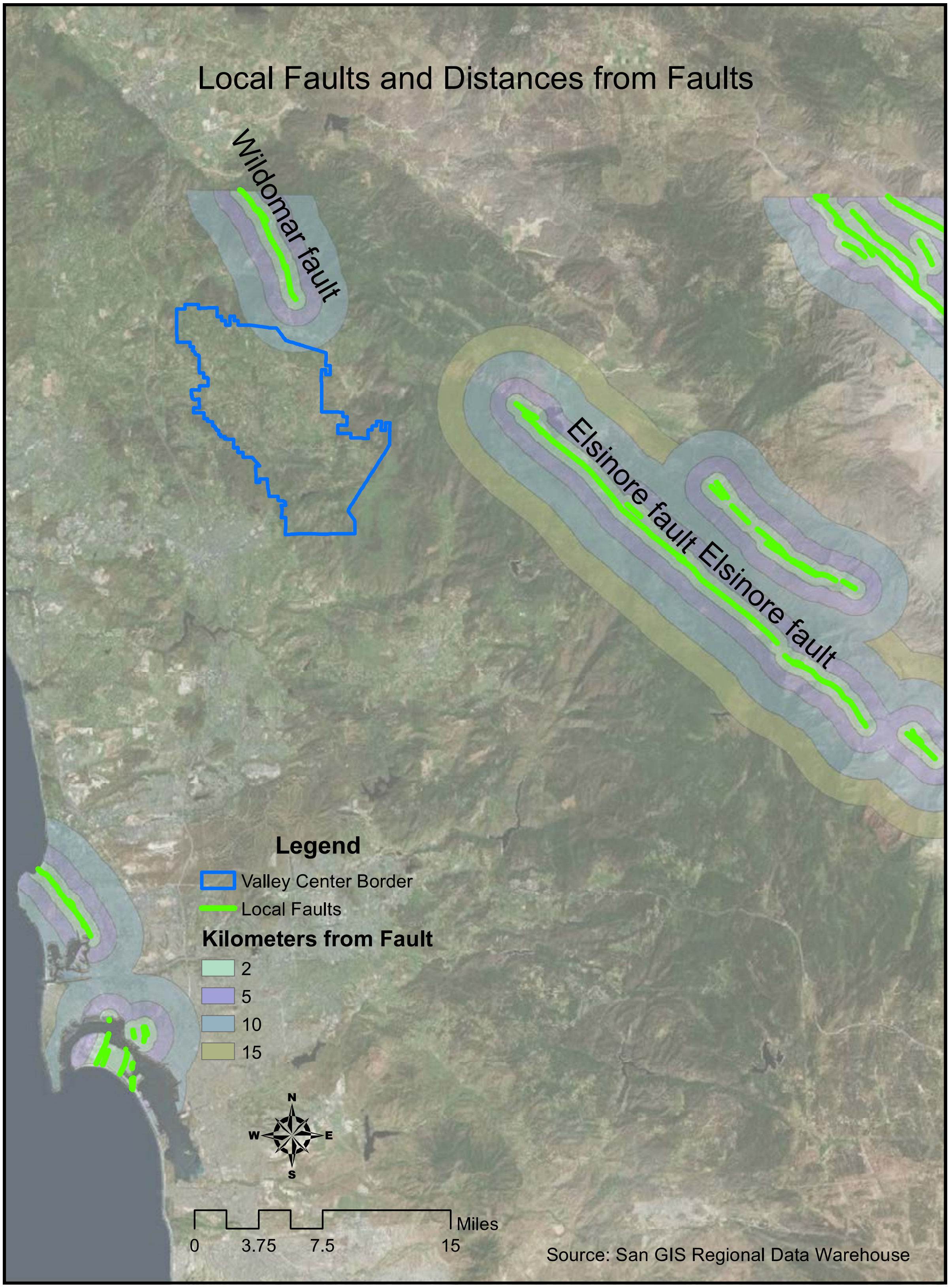
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

Author:
Brian Fuchs
National Drought Mitigation Center

USDA

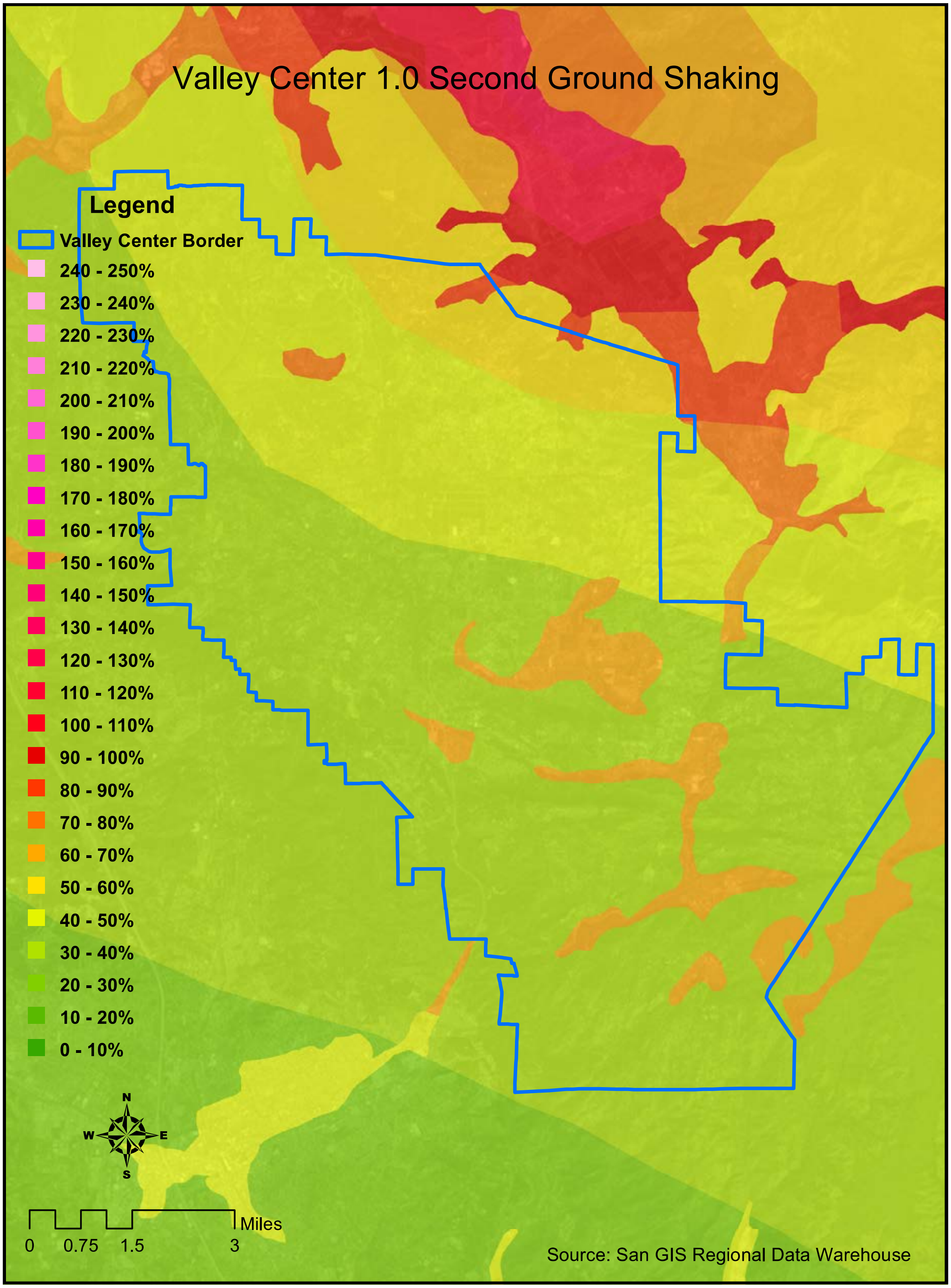
http://droughtmonitor.unl.edu/

Map D-13



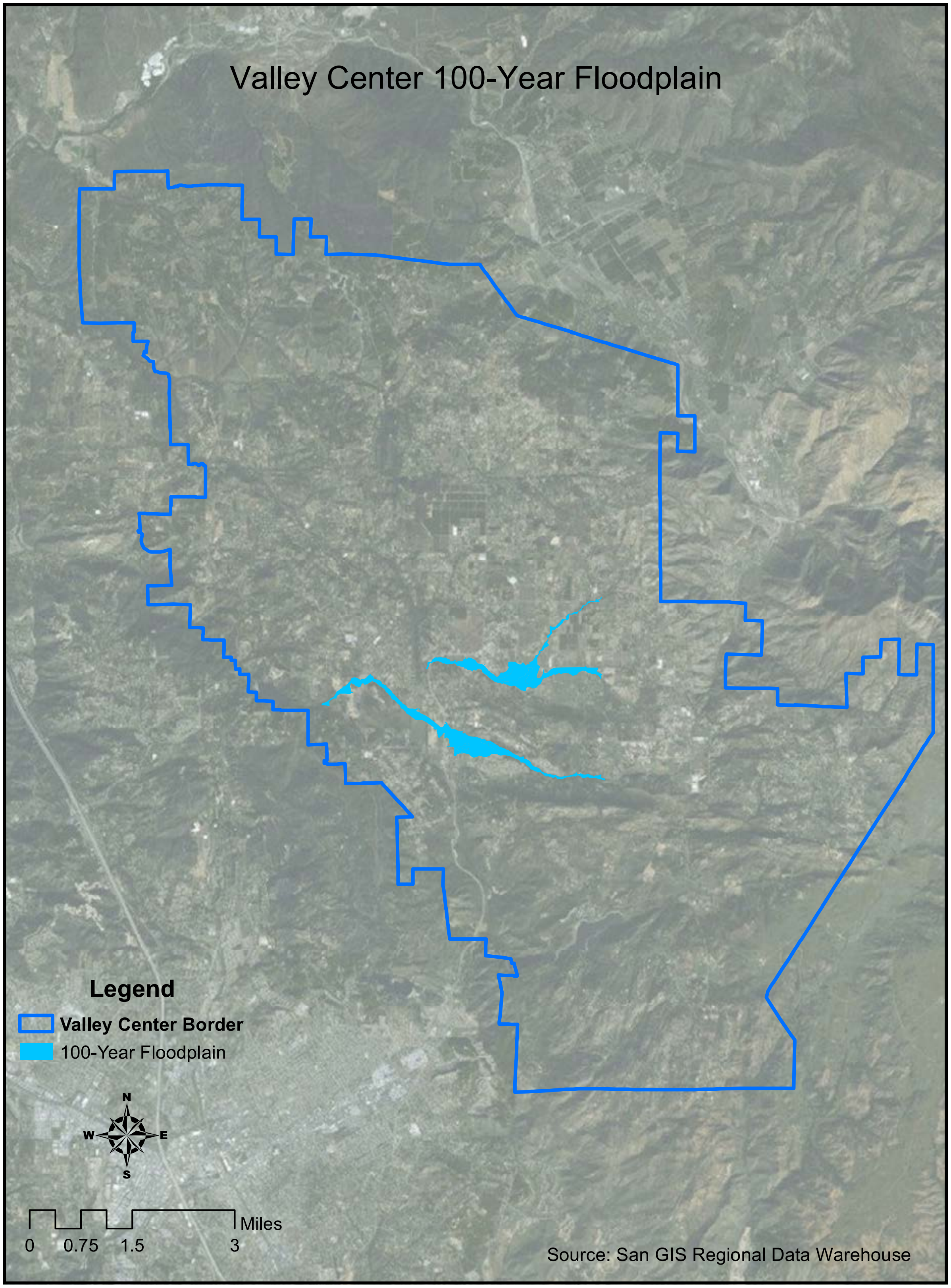
Local Faults and Distances from Faults
Wildomar fault
Elsinore fault
Elsinore fault
Legend
Valley Center Border
Local Faults
Kilometers from Fault
2
5
10
15
N
W
E
S
0
3.75
7.5
15
Miles
Source: San GIS Regional Data Warehouse

Map -14



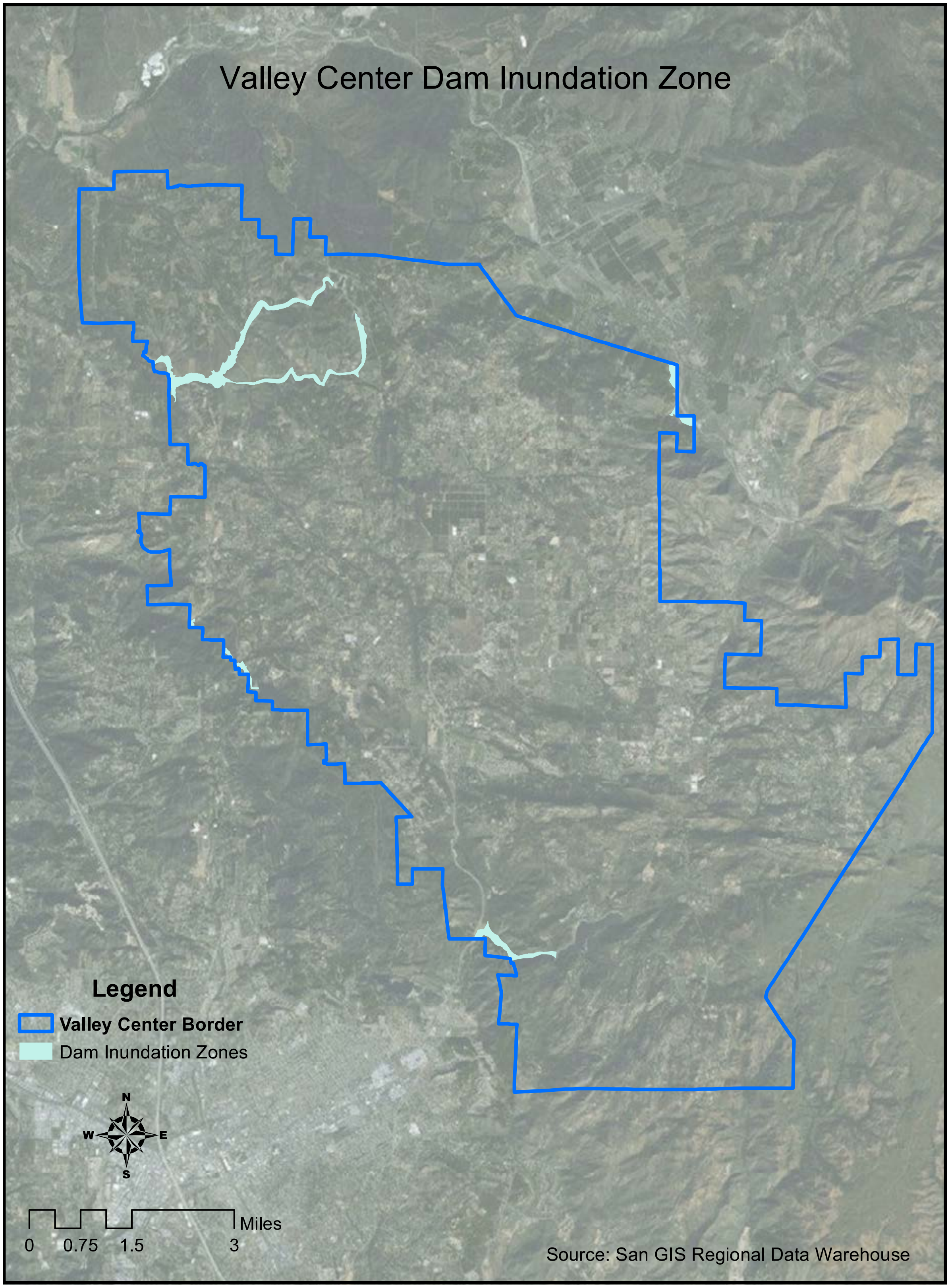
Valley Center 1.0 Second Ground Shaking
Legend
Valley Center Border
240 - 250%
230 - 240%
220 - 230%
210 - 220%
200 - 210%
190 - 200%
180 - 190%
170 - 180%
160 - 170%
150 - 160%
140 - 150%
130 - 140%
120 - 130%
110 - 120%
100 - 110%
90 - 100%
80 - 90%
70 - 80%
60 - 70%
50 - 60%
40 - 50%
30 - 40%
20 - 30%
10 - 20%
0 - 10%
N
W
E
S
Miles
0
0.75
1.5
3
Source: San GIS Regional Data Warehouse

Map D-15



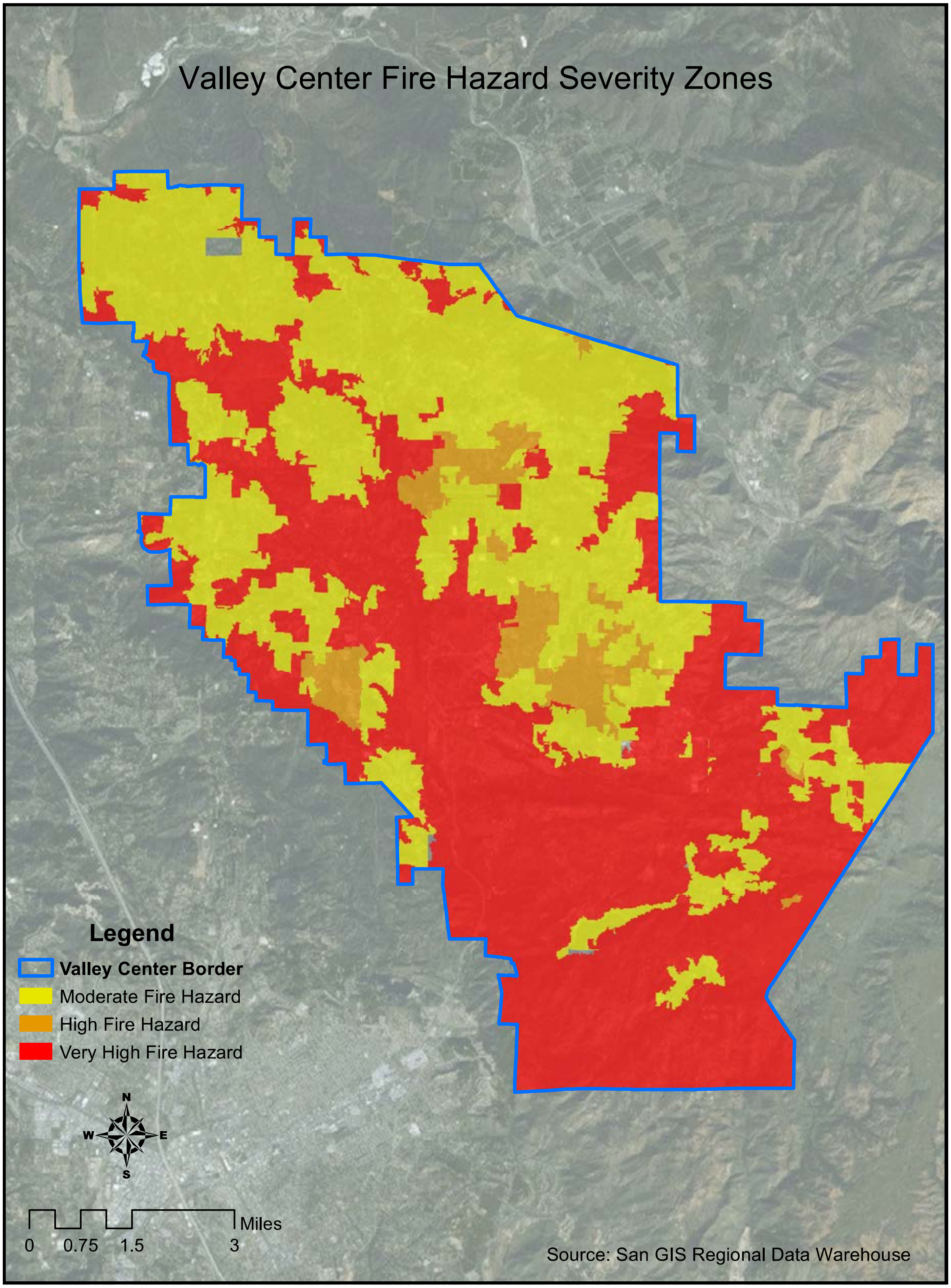
Valley Center 100-Year Floodplain
Legend
Valley Center Border
100-Year Floodplain
N
W
E
S
0
0.75
1.5
3
Miles
Source: San GIS Regional Data Warehouse

Map D-16



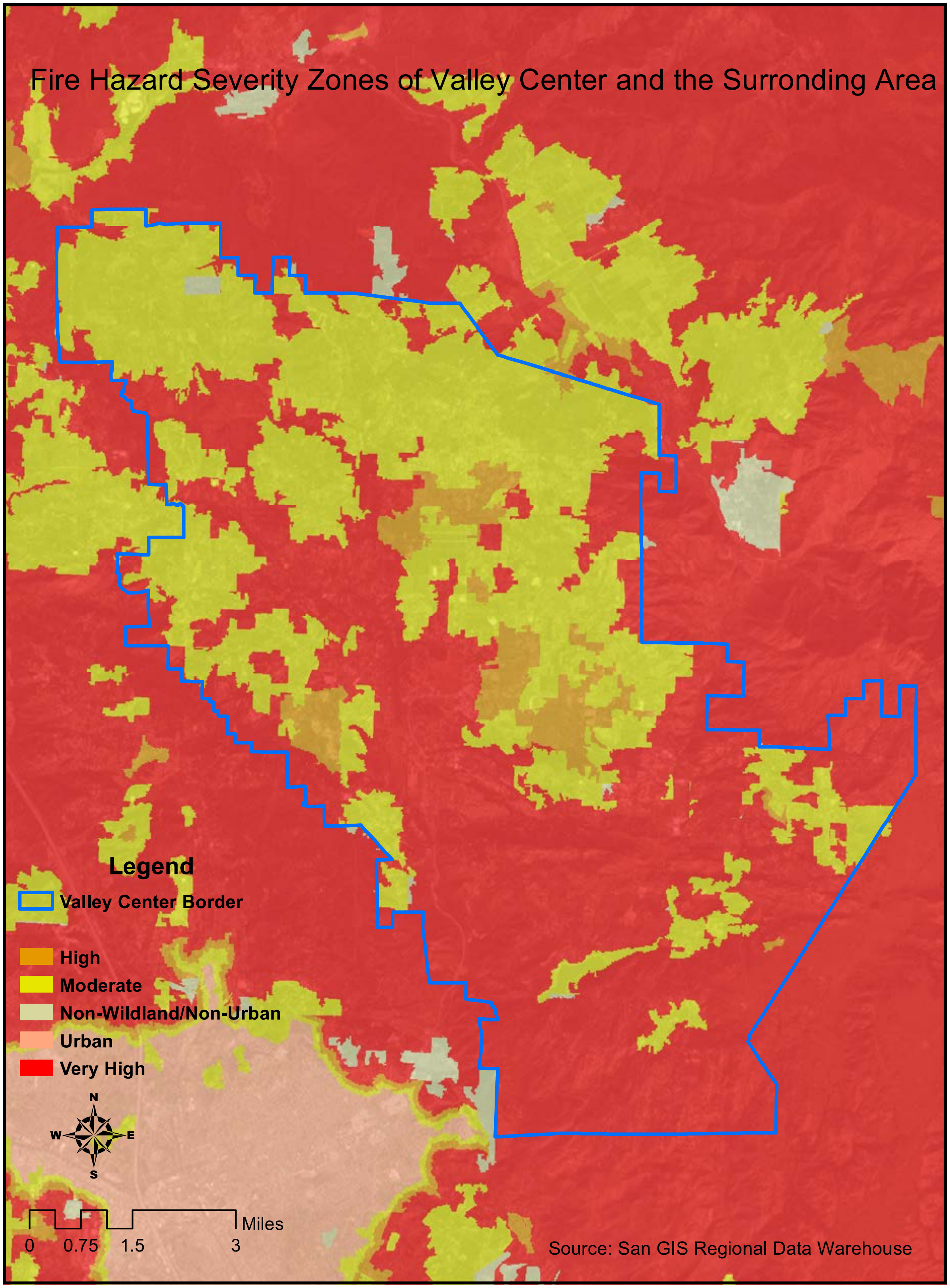
Valley Center Dam Inundation Zone
Legend
Valley Center Border
Dam Inundation Zones
N
W
E
S
0
0.75
1.5
3
Miles
Source: San GIS Regional Data Warehouse

Map D-17



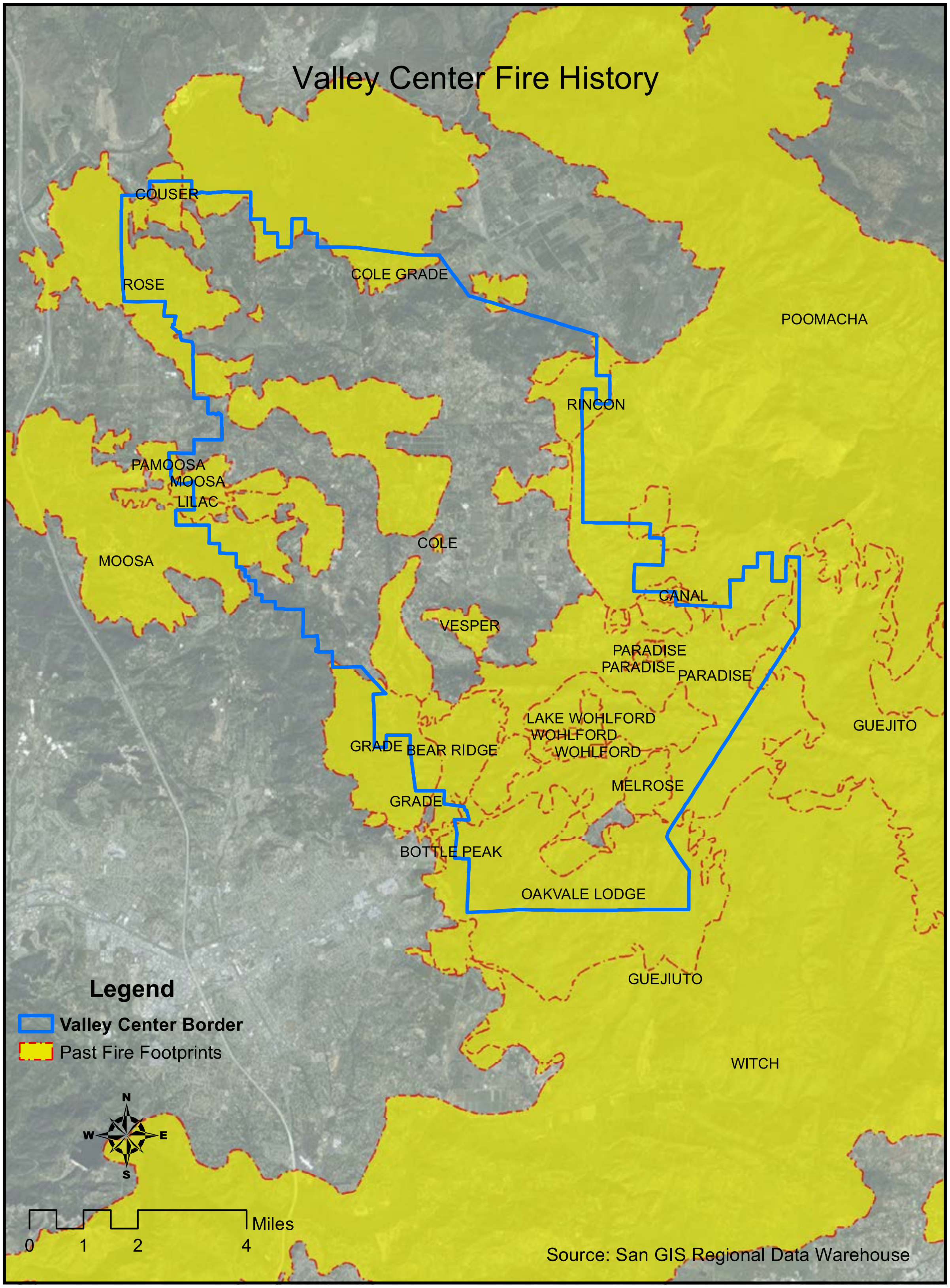
Valley Center Fire Hazard Severity Zones
Legend
Valley Center Border
Moderate Fire Hazard
High Fire Hazard
Very High Fire Hazard
N
W
E
S
0
0.75
1.5
3
Miles
Source: San GIS Regional Data Warehouse

Map D-18



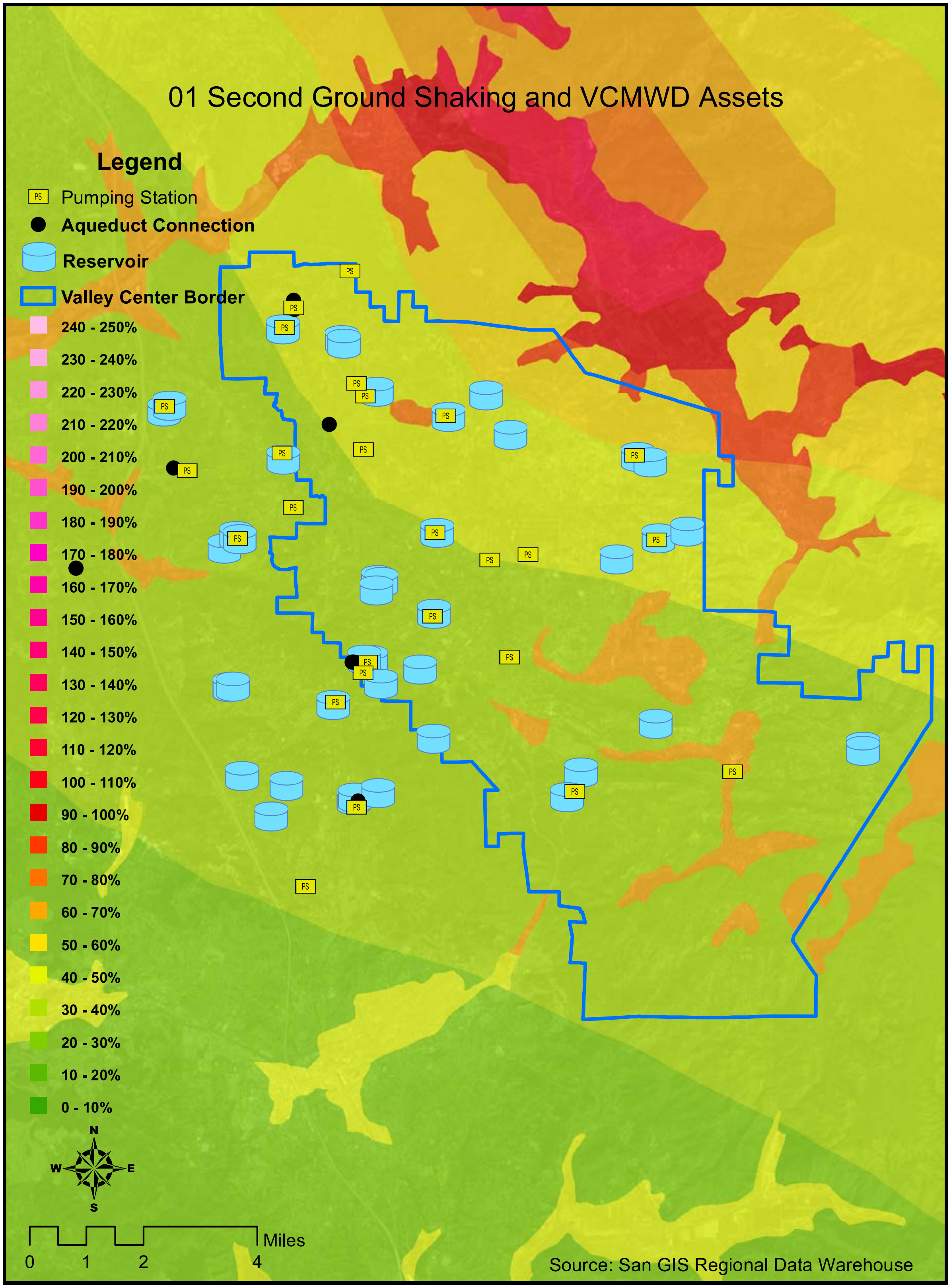
Fire Hazard Severity Zones of Valley Center and the Surronding Area
Legend
Valley Center Border
High
Moderate
Non-Wildland/Non-Urban
Urban
Very High
N
W
E
S
0
0.75
1.5
3
Miles
Source: San GIS Regional Data Warehouse

Map D- 19

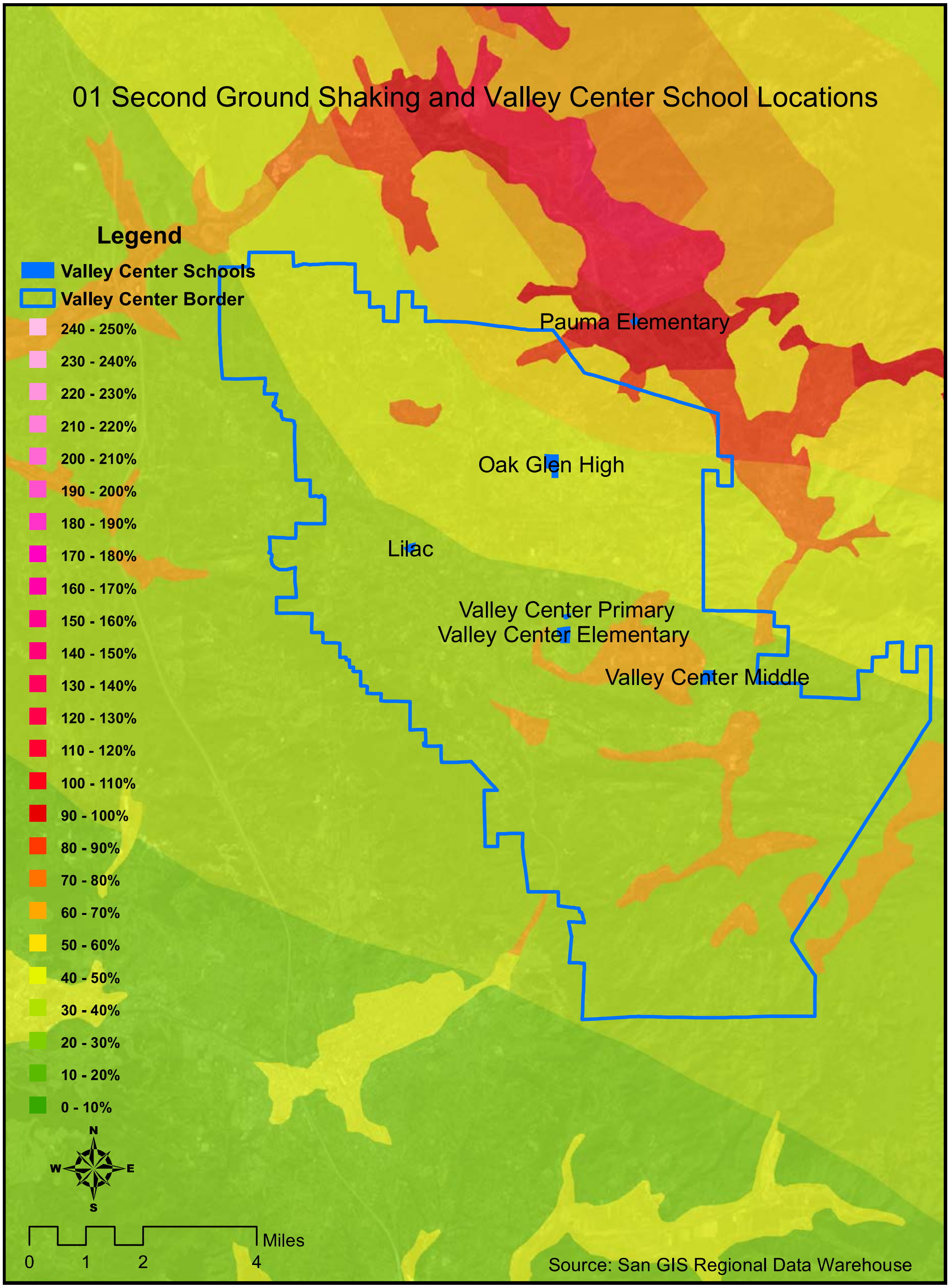


Valley Center Fire History
COUSER
ROSE
COLE GRADE
POOMACHA
RINCON
PAMOOSA
MOOSA
LILAC
MOOSA
COLE
CANAL
VESPER
PARADISE
PARADISE
PARADISE
LAKE WOHLFORD
WOHLFORD
WOHLFORD
GUEJITO
GRADE
BEAR RIDGE
MELROSE
GRADE
BOTTLE PEAK
OAKVALE LODGE
GUEJIUTO
WITCH
Legend
Valley Center Border
Past Fire Footprints
N
W
E
S
0
1
2
4
Miles
Source: San GIS Regional Data Warehouse

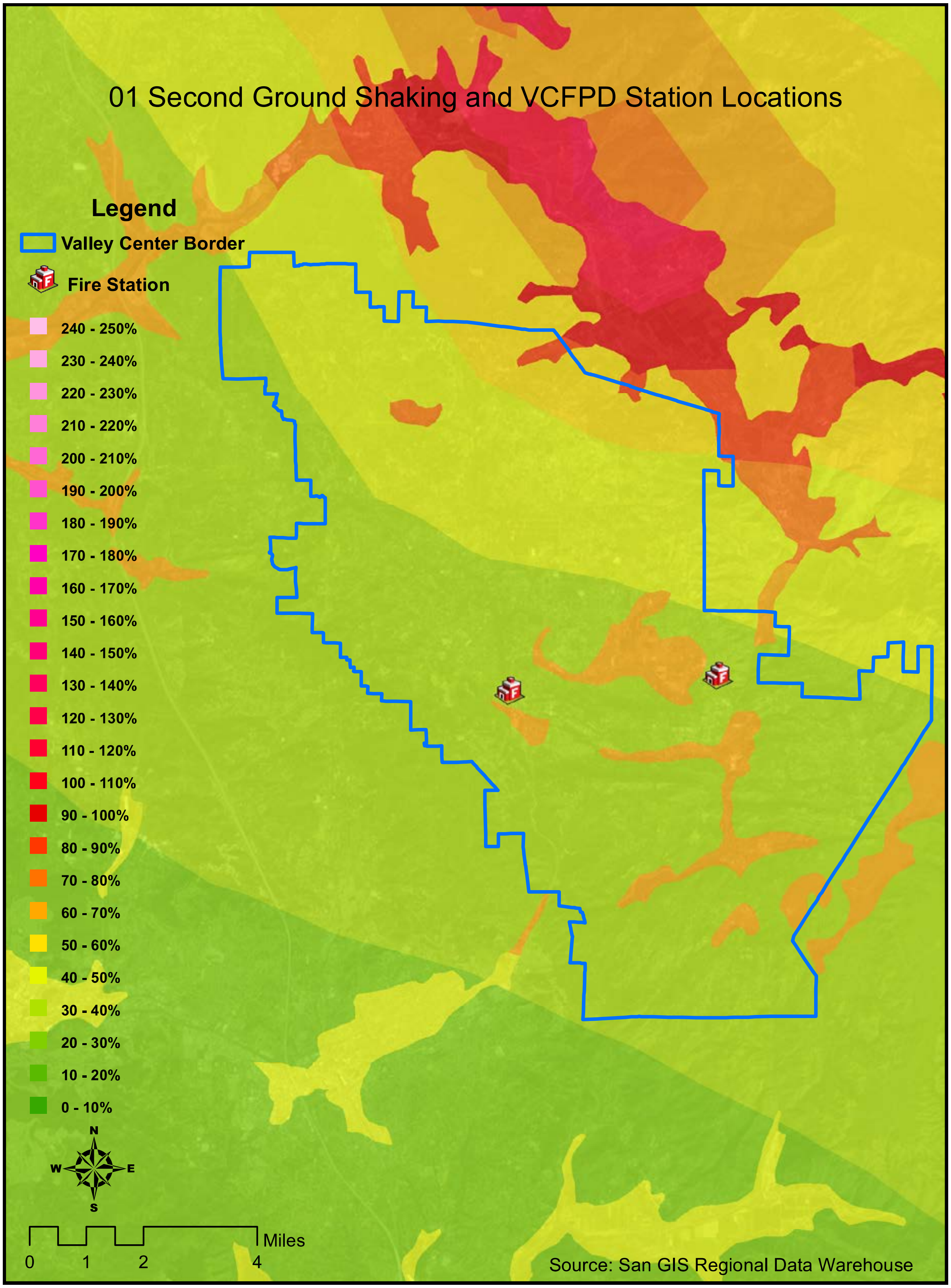
Map D- 20


01 Second Ground Shaking and VCMWD Assets
Legend
Pumping Station
Aqueduct Connection
Reservoir
Valley Center Border
240 - 250%
230 - 240%
220 - 230%
210 - 220%
200 - 210%
190 - 200%
180 - 190%
170 - 180%
160 - 170%
150 - 160%
140 - 150%
130 - 140%
120 - 130%
110 - 120%
100 - 110%
90 - 100%
80 - 90%
70 - 80%
60 - 70%
50 - 60%
40 - 50%
30 - 40%
20 - 30%
10 - 20%
0 - 10%
N
W
E
S
Miles
0
1
2
4
Source: San GIS Regional Data Warehouse

Map D- 21

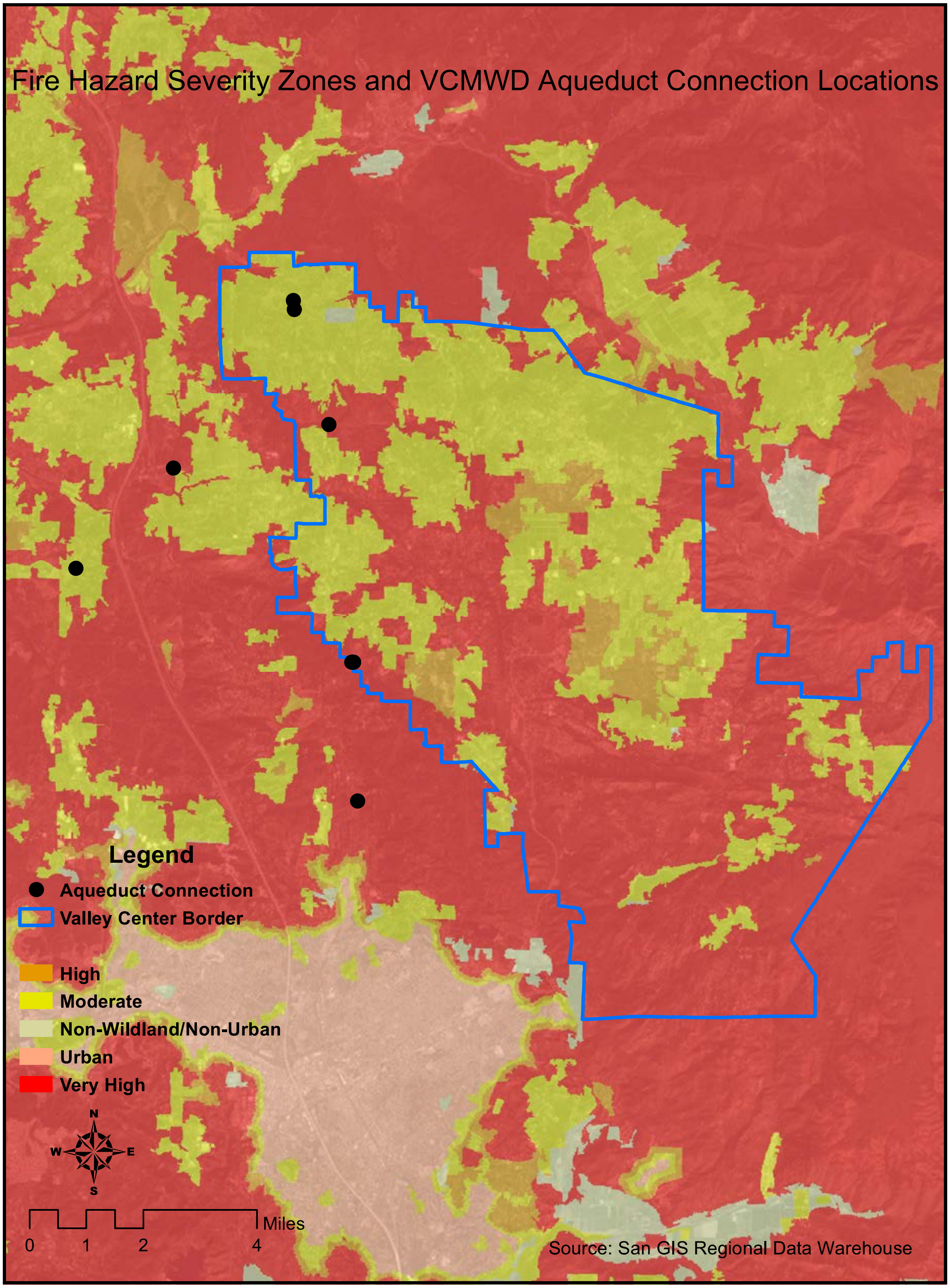

01 Second Ground Shaking and Valley Center School Locations
Legend
Valley Center Schools
Valley Center Border
240 - 250%
230 - 240%
220 - 230%
210 - 220%
200 - 210%
190 - 200%
180 - 190%
170 - 180%
160 - 170%
150 - 160%
140 - 150%
130 - 140%
120 - 130%
110 - 120%
100 - 110%
90 - 100%
80 - 90%
70 - 80%
60 - 70%
50 - 60%
40 - 50%
30 - 40%
20 - 30%
10 - 20%
0 - 10%
Pauma Elementary
Oak Glen High
Lilac
Valley Center Primary
Valley Center Elementary
Valley Center Middle
N
W
E
S
Miles
0
1
2
4
Source: San GIS Regional Data Warehouse

Map D- 22



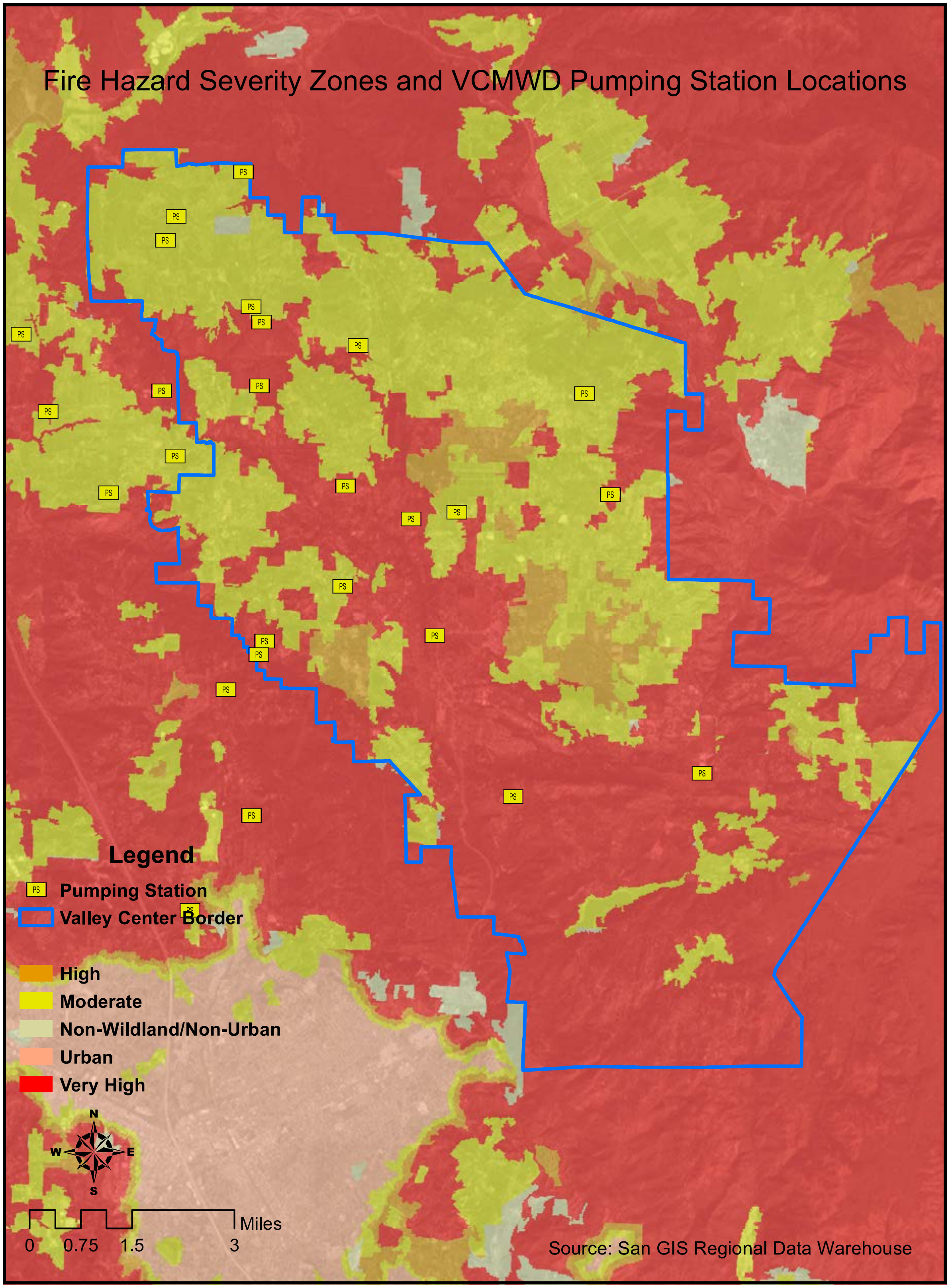
01 Second Ground Shaking and VCFPD Station Locations
Legend
Valley Center Border
Fire Station
240 - 250%
230 - 240%
220 - 230%
210 - 220%
200 - 210%
190 - 200%
180 - 190%
170 - 180%
160 - 170%
150 - 160%
140 - 150%
130 - 140%
120 - 130%
110 - 120%
100 - 110%
90 - 100%
80 - 90%
70 - 80%
60 - 70%
50 - 60%
40 - 50%
30 - 40%
20 - 30%
10 - 20%
0 - 10%
N
W
E
S
Miles
0
1
2
4
Source: San GIS Regional Data Warehouse

Map D- 23



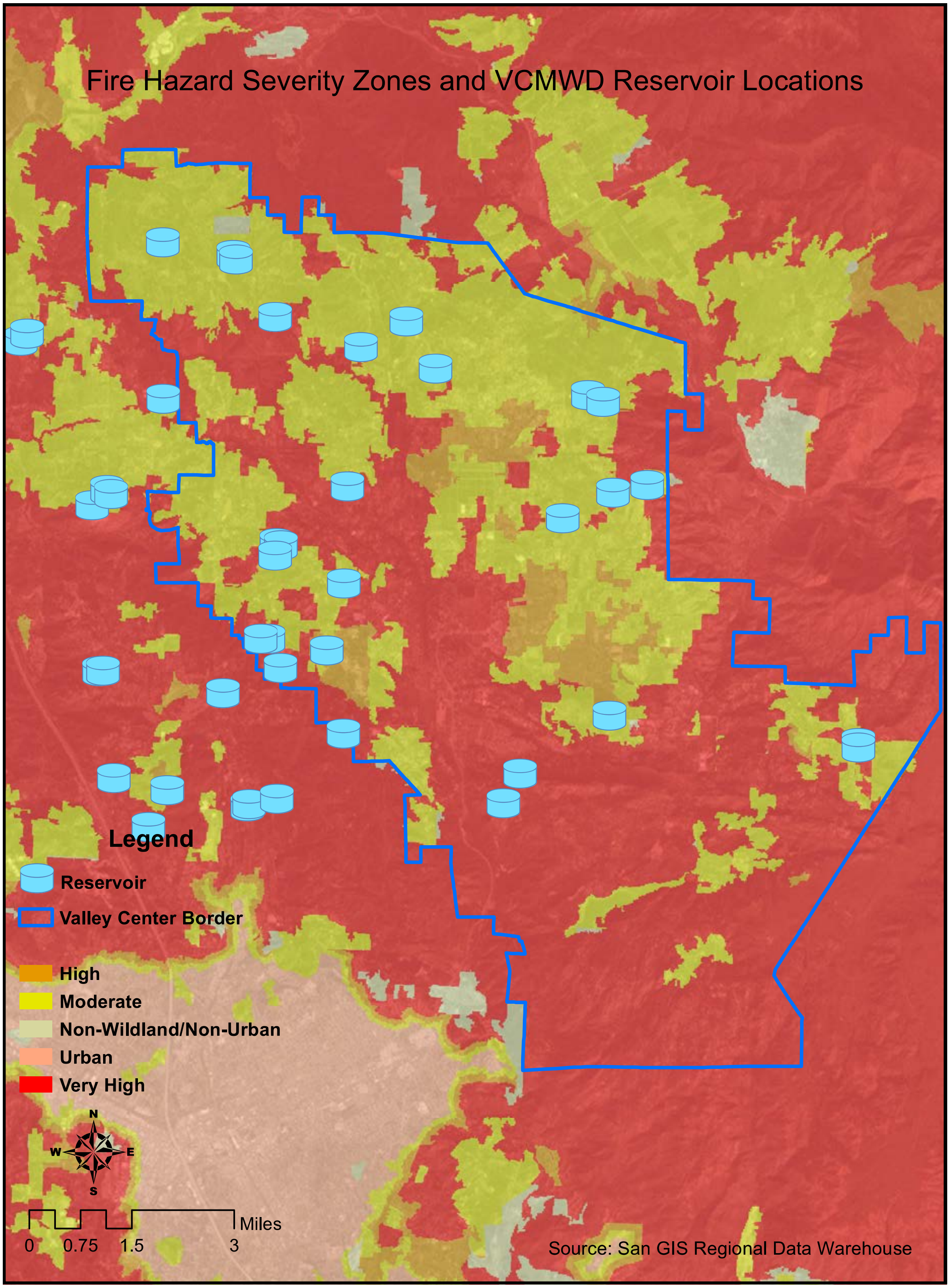
Fire Hazard Severity Zones and VCMWD Aqueduct Connection Locations
Legend
Aqueduct Connection
Valley Center Border
High
Moderate
Non-Wildland/Non-Urban
Urban
Very High
N
W
E
S
0
1
2
4
Miles
Source: San GIS Regional Data Warehouse

Map D- 24

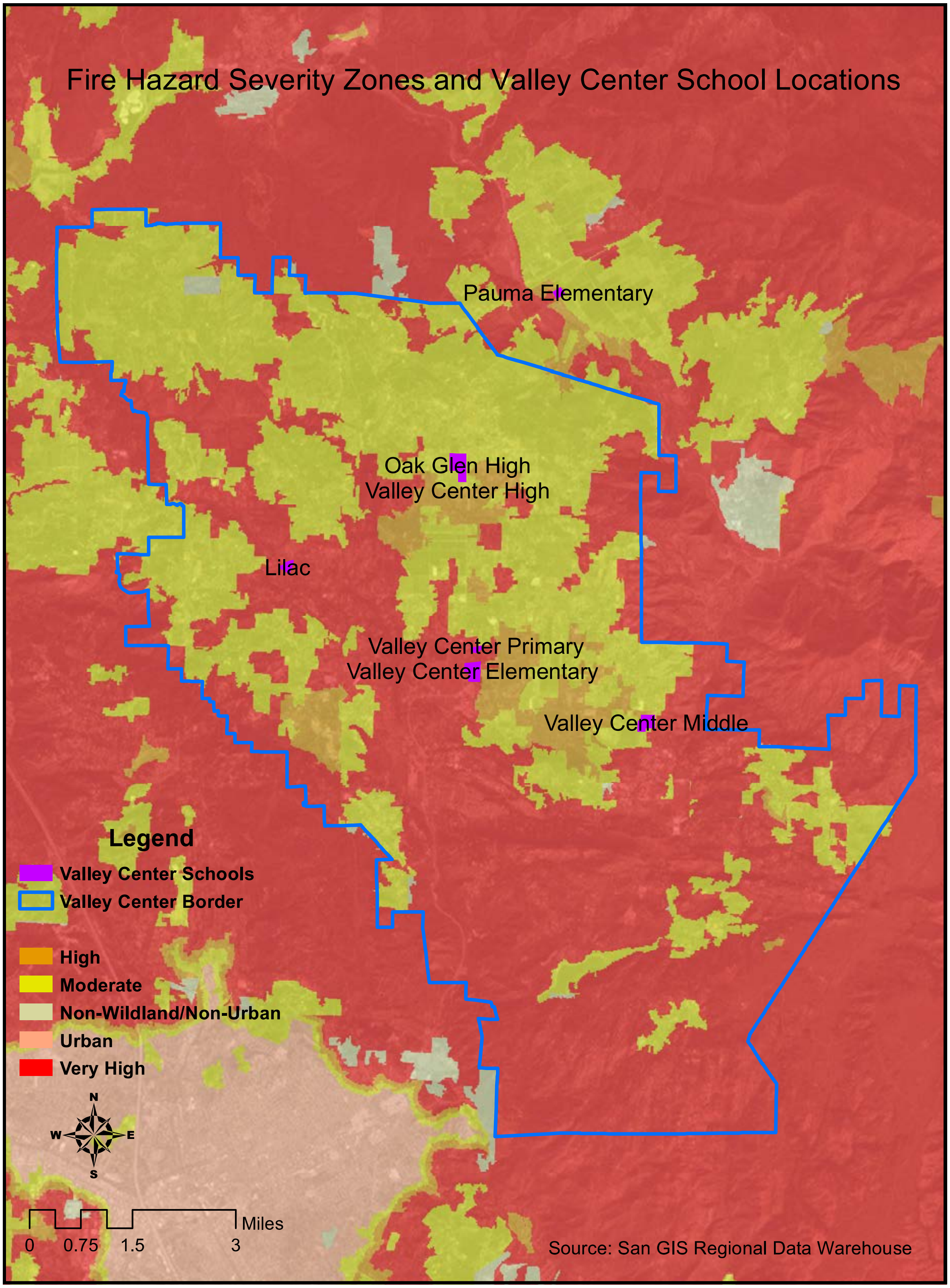


Map D- 19

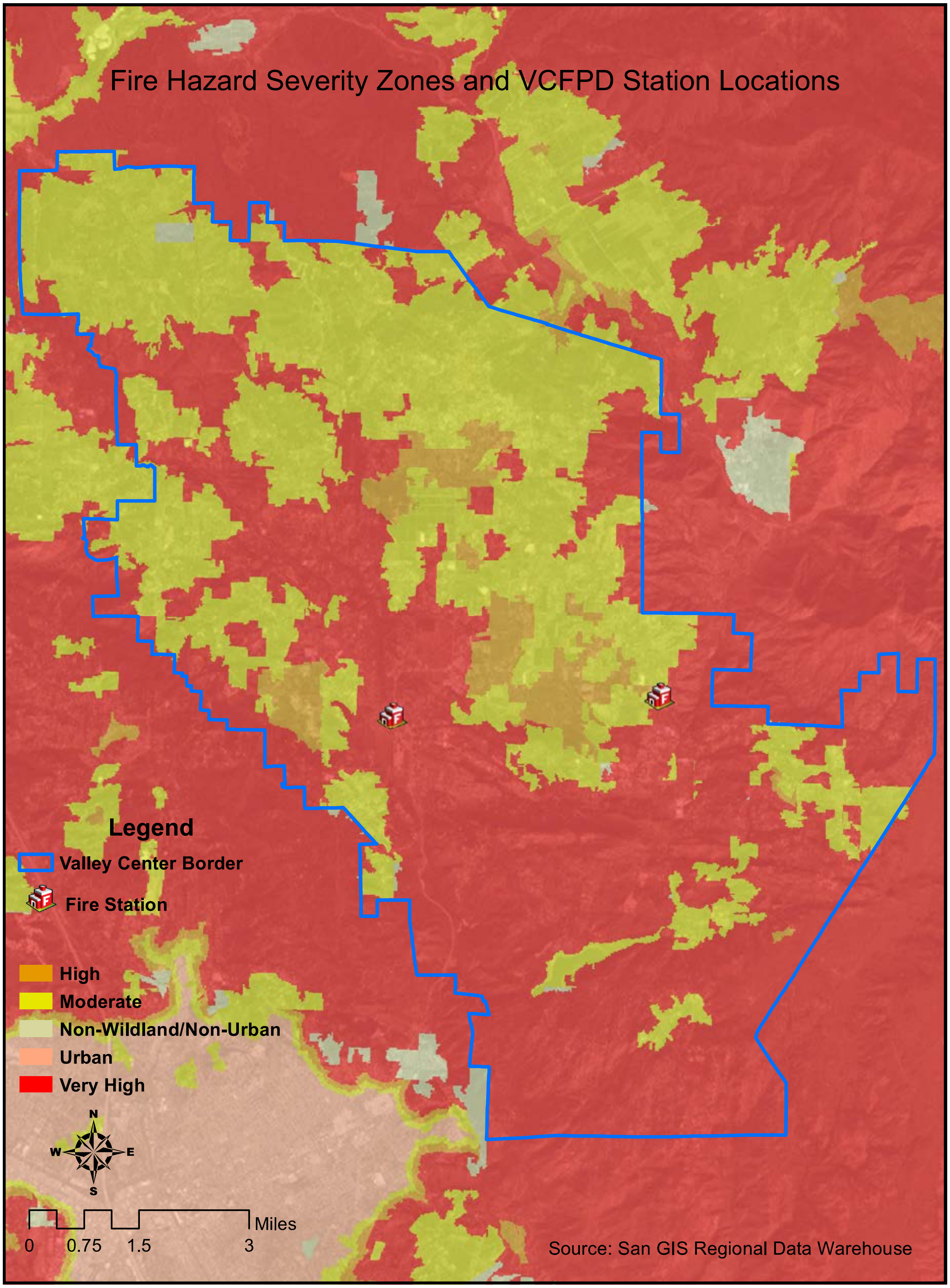
Map D- 25


Fire Hazard Severity Zones and VCMWD Reservoir Locations
Legend
Reservoir
Valley Center Border
High
Moderate
Non-Wildland/Non-Urban
Urban
Very High
N
W
E
S
0
0.75
1.5
3
Miles
Source: San GIS Regional Data Warehouse

Map D- 26


Fire Hazard Severity Zones and Valley Center School Locations
Pauma Elementary
Oak Glen High
Valley Center High
Lilac
Valley Center Primary
Valley Center Elementary
Valley Center Middle
Legend
Valley Center Schools
Valley Center Border
High
Moderate
Non-Wildland/Non-Urban
Urban
Very High
N
W
E
S
Miles
0
0.75
1.5
3
Source: San GIS Regional Data Warehouse

Map D- 27



Fire Hazard Severity Zones and VCFPD Station Locations
Legend
Valley Center Border
Fire Station
High
Moderate
Non-Wildland/Non-Urban
Urban
Very High
N
W
E
S
0
0.75
1.5
3
Miles
Source: San GIS Regional Data Warehouse

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