

Draft report prepared by Transmission & Distribution Planning Department

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GLOSSARY

Buildout—The point at which all available land is developed according to the land-use ordinances. Buildout is not forecasted to occur at a specified time but is anticipated to occur far into the future.

Capacity—The maximum amount of power an element of the power system can handle or produce. Measured in megawatts (MW).

Demand—The amount of energy used at one time. Measured in megawatts (MW). One MW = 1,000,000 watts.

Distributed generation—Small generators connected to the distribution system (e.g., wind turbine).

Distribution circuits (12.5 to 34.5 kilovolts [kV])—Electrical circuits used to distribute power from distribution substations to homes and businesses throughout the community.

Distribution substation—Substations that serve local loads in urban and rural neighborhoods.

Double-circuit—Two transmission circuits sharing the same poles.

Energy—Amount of power used over time. Measured in kilowatt-hours (kWh).

High-voltage transmission (230 to 500 kV)—Electrical circuits used to transfer large amounts of power long distances.

In-and-out—Two transmission circuits that serve a distribution substation. If one transmission circuit is out of service, the distribution substation can be served from the other transmission circuit.

Kilovolt (kV)– Unit of measurement of voltage. 1 kV = 1,000 volts.

Load – Cumulative electrical demand from customers in an area.

Magic Valley Electrical Plan (MVEP) –The Regional Electrical Plan for the Magic Valley. It was originally completed in 2008 and updated in 2018.

Megawatt (MW)—Unit of measurement of power. 1 MW = 1,000,000 watts.

Power—The rate at which work is performed. Measured in megawatts (MW). One MW = 1,000,000 watts.

Radial—One transmission circuit that serves a distribution substation. If the transmission circuit is out of service, the distribution substation will not have power.

Regional Electrical Plan—Together with local jurisdictions and customers, Idaho Power created regional electrical plans to determine where to construct new facilities to meet customers' energy needs.

Reliability—The degree to which customers can depend on electrical service. Key components of reliability include how often power outages occur, how long the outages last, and how many customers are impacted.

Source substation—Converts high-voltage transmission lines (230 kV and above) to lower voltages (46 to 138 kV). Acts as a power source for distribution substations.

Substation—A substation is used to transform one voltage to another and protect and control power lines. Substations include transformers, circuit breakers, switches, support structures, and large metallic pipe, called bus, to connect the components.

Tap—The location at which a transmission circuit is attached to another transmission circuit.

Transmission (46 to 138 kV)—Electrical circuits used to transfer power from source substations to distribution substations and between distribution substations.

Voltage—The pressure that moves a current of electricity. Measured in kilovolts (kV) for power lines. One kV = 1,000 volts.

BACKGROUND

In 2008, the Magic Valley Electrical Plan (Original Plan) was developed with the assistance of a community advisory committee (Original Committee) consisting of community representatives. The Original Plan identified infrastructure improvements and additions to address anticipated growth and provide reliable power far into the future. It provided a strategy to serve the electrical power needs of Idaho Power's customers in a region made up of Gooding, Lincoln, Jerome, Twin Falls, and parts of Minidoka and Cassia counties. The Original Plan provided preferred locations for future substations and transmission line routes recommended by the Original Committee.

In 2018, Idaho Power performed a technical analysis of the Magic Valley electrical system and determined that nine new distribution substations, two new source substations, and the connecting transmission lines would be required to serve anticipated buildout loads. Another community advisory committee (the Committee) was formed. Representatives from environmental agencies, various government divisions and jurisdictions, small and large businesses, and community leaders and members were assembled and asked to assist Idaho Power with reviewing and updating the Original Plan. A complete list of the <u>committee members</u> can be found following the cover page of this report. The members provided a broad and diverse knowledge base that added important insight to the electrical planning process. The Committee started its work on the Magic Valley Electrical Plan Update (the Plan) in September 2018. Meetings were held monthly through December 2018, with a final meeting in March 2019. Through these meetings, the Committee then reviewed and updated the Community Goals and Siting Criteria from the Original Plan. A list of the updated Community Goals and Siting Criteria can be found in <u>Appendix A</u>. The following items were out of the scope of the Plan:

- Distribution circuits
- ✤ Transmission lines outside the Plan area
- 500-kilovolt (kV) transmission lines associated with the Gateway West project, which has its own process: <u>idahopower.com/energy/planning/project-news/gateway-west/</u>

To facilitate the development of the Plan, the study area was divided into the following sub-areas:

- ✤ 230-kV Transmission Lines and Source Substations
- ✤ Area 1: West Valley—North of Snake River
- ✤ Area 2: West Valley—South of Snake River
- ✤ Area 3: East Valley

The Committee broke into three groups to develop plan recommendations. The results of each group's efforts can be found in <u>Appendix B</u>.

The Committee used each group's recommendations to develop a single preferred option for each new substation location and transmission line route. These options will be part of Idaho Power's long-range plan and will be constructed only as required by growth. The Committee also developed alternative options should the preferred option not be feasible at the time of construction. If the preferred option is not feasible and an alternative is not provided, Idaho Power will use the Community Goals and Siting Criteria to select a location near the preferred location. Details and maps of the preferred and alternative options are in the <u>Mapping Results</u> section of this document.

For more information on Idaho Power's process for updating electrical plans, review the Electrical Plan Update Process document on the Idaho Power website or by using the following link: idahopower.com/energy/planning/regional-electric-plans/

Questions regarding either the electrical planning process or the results of the Magic Valley Electrical Plan (MVEP) Update 2018 can be directed to the Southern Regional Planning Engineer at 208-736-3231.

IMPLEMENTATION PLAN

The Committee recommended infrastructure improvements to the Idaho Power system to serve the anticipated load in the Magic Valley at buildout. Not all the infrastructure improvements proposed by the Committee are needed in the near term and will be phased in based on load growth, reliability, and transmission line/transformer capacity. Based on Idaho Power's load forecasts in 2018, the following infrastructure improvements are anticipated in these time periods:

0-10 Years (2018-2028)

- ✤ Upgrade Shoshone Substation from 46 kV to 138 kV (See Figure 2).
- Build a new 138-kV transmission line from Midpoint Substation to Shoshone Substation (See Figure 2).
- → Upgrade Filer Substation from 46 kV to 138 kV (See Figure 3).
- Build a new 138-kV transmission line from Pole Line Substation to Filer Substation (See Figure 3).
- ✤ Build new substation in North East Twin Falls, Sub 8 (See Figure 3).

10-20 Years (2028-2038)

- → Upgrade Burley Rural Substation from 69 kV to 138 kV (See Figure 4).
- Build a 138-kV transmission line from Milner Substation to Burley Rural Substation (See Figure 4).
- → Build a new substation southeast of Jerome, Sub 2 (See Figure 2).
- Build a new 138-kV transmission line from Northview Substation to Filer Substation (See Figure 3).
- Build new source substation, Cedar Hill or Source 1, south of Hansen. Note: If Cedar Hill Substation is built as part of the Gateway West 500-kV Transmission Project, this project will be to modify the substation to enable 138-kV transmission to be fed from the substation (See Figure 1).

The preferred options for future substation locations and transmission line routes identified in the plan will be the first solutions investigated for implementation when required by growth. Individual projects resulting from this plan may require jurisdictional approval, which often includes an open, public siting process. Facilities identified in this plan will be preferred, but are subject to change due to land availability, community and customer preference, and needs discovered during the development phase. Typically, permitting and siting takes approximately 12 to 18 months. Depending on the project scale, construction takes approximately 6 to 12 months. The process may include the following steps:

- ✤ Pre-application meeting with jurisdiction to identify the project need and location(s)
- → Public meetings—outreach and open houses with customers, landowners, and stakeholders

- If several options exist, they can be vetted here to establish a site preference.
- Permit application—development and submission by Idaho Power for consideration and review by jurisdictional planning staff
- Public Hearing—permit consideration and decision by the jurisdictional hearing body
 - o Idaho Power presents application, including need, location, and site improvements.
 - Public opportunity to provide information towards the decision (testimony).
 - Hearing body decision to approve, approve with conditions, or deny application.

Idaho Power believes public engagement during the siting and permitting of facilities is an important part of the planning process. We appreciate a community's willingness to participate in development of the best possible solution to continue to serve customers. We encourage the inclusion of details from this Plan in future iterations of city and county comprehensive plans. This will help communities be aware of future utility facilities during their planning process.

Idaho Power sincerely thanks the Committee and the businesses that provided facilities to accommodate the process. The Plan will facilitate the public siting process for improvements to serve the Magic Valley.

MAPPING RESULTS

230-kV Transmission and Source Substations



Figure 1: Preferred 230-kV transmission lines and source substations

Preferred Options

The Committee chose preferred locations for two new source substations and the connecting 230-kV line routes in the Magic Valley.

Preferred Source Substation Locations

Source 1

The Committee opted to co-locate the first source substation with the planned Cedar Hill Substation. Cedar Hill is part of the Gateway West 500-kV transmission project, and its exact location has not yet been determined. It is anticipated that Cedar Hill will be located near the existing Artesian Substation, southeast of Hansen near the intersection of E 2900 N and N 4100 E.

Source 2

The second preferred source substation is located near the intersection of E 3100 N and N 2200 E in Twin Falls County.

Preferred High-Voltage Transmission Line Routes

Source 1 to Source 2

Build a 230-kV transmission line from Source 1 to Source 2 along the South Hills.

Source 2 to Justice Substation

Build a 230-kV transmission line west from Source 2 near Salmon Falls Creek, then north following the existing transmission line corridor to the existing Justice Substation.



Area 1: West Valley—North of Snake River

Figure 2: West Valley—North of the Snake River

Preferred Options

In the West Valley, north of the Snake River, the Committee selected preferred locations for three new substations and the connecting 138-kV line routes.

Preferred Substation Locations

Distribution Substation 1 (Sub 1)

Northeast corner of the intersection of Highway 75 and E 520 N

Distribution Substation 2 (Sub 2)

Intersection of S 300 E and Crossroads Point Blvd

Distribution Substation 3 (Sub 3)

Intersection of E 3300 S (West Rd) and S 2400 E (County Line Rd)

Preferred 138-kV Transmission Line Routes

Shoshone Substation to Sub 1

Build a 138-kV transmission line north from Shoshone Substation along Highway 75 to W 520 E (Sub 1).

 If a new highway is constructed that bypasses Shoshone, the preferred line route would follow the new highway.

Shoshone Substation to Pocket Tap

Build a 138-kV transmission line east from Shoshone Substation following the existing 46 kV transmission line route to the Pocket Tap (intersection of Highway 26 and S 2325 E).

Uses an existing transmission line route

Shoshone Substation to Midpoint Substation

Build a 138-kV transmission line south from Shoshone Substation along Highway 93 to Midpoint Substation.

Uses an existing transmission line route

Midpoint Substation to Perrine Tap

Build a 138-kV transmission line south from Midpoint Substation along Highway 93, and turn east on E 200 N. Turn south on N 500 E to the Perrine Tap (intersection of E 200 N and S 500 E).

Uses an existing transmission line route

Perrine Tap to Perrine Substation

Build a 138-kV transmission line east from the Perrine Tap (intersection of E 200 N and S 500 E) along E 200 S. Turn south on S 600 E, and turn east again on E 200 S to Perrine Substation (intersection of E 200 S and S 800 E).

Uses an existing transmission line route

Perrine Tap to Cliff Substation

Build a 138-kV transmission line south from the Perrine Tap (intersection of E 200 N and S 500 E) along S 500 E, crossing I-84 and continuing near Shoshone Old Stage Rd. to Cliff Substation.

➤ Uses an existing transmission line route

Sub 2 In-and-Out

Tap the existing 138-kV transmission line at the intersection of E 400 S and S 200 E. Build a 138-kV transmission line east along E 400 S, turning south at S 300 E. The new line will continue south, turning east at Crossroads Point Blvd to Sub 2. From Sub 2, the new line will continue east on Crossroads Point Blvd turning south to Kuhn Drive. The new line will turn east on E 526 S and connect to an existing 138-kV transmission line at the intersection of E 526 S and S 500 E.

This line route provides good accessibility for construction and maintenance. It provides two sources to Sub 2 and avoids irrigated farm land.

Dale to Wendell Tap

Build a 138-kV transmission line east out of Dale Substation along E 3200 S to S 1950 E.

Wendell Tap to Wendell Substation

Build a double-circuit, 138-kV transmission line north along S 1950 E, crossing I-84 and turning west on W Avenue F to Wendell Substation.

Wendell Tap to Sub 3

Build a 138-kV transmission line south on S 1950 E, turning east on E 3300 S (West Road) to Sub 3.

Sub 3 to Jerome Substation

Build a 138-kV transmission line south out of Sub 3 on S 2400 E, turning east on W 100 S. Cross I-84 and turn north on S Lincoln Ave. to Jerome Substation. The section of transmission line on S Lincoln Ave. will be a double-circuit, 138-kV transmission line with the existing 138-kV transmission line.

This route keeps the sources geographically separated and avoids agricultural areas. The line section along S Lincoln Ave. utilizes an existing line route.

Hagerman Substation In-and-Out

Tap the existing 138-kV transmission line near the where the Malad River and the Snake River run together and build a double-circuit, 138-kV transmission line along E 2300 S to Hagerman Substation.

Alternative Options

The Committee selected an alternative option for Sub 3 located 0.3 miles east of the preferred Sub 3 location on E 3300 S (West Rd).

The Committee also selected alternative line routes for the following transmission line sections:

Wendell Tap to Sub 3 Alternative

Build a 138-kV transmission line east from the Wendell Tap along E 3200 S, turning south on S 2400 E to Sub 3.

Sub 3 to Dale–Cliff 138-kV Transmission Line Alternative

Build a 138-kV transmission line south from Sub 3 along S 2400 E, turning west on E 3500 S and connecting to the existing 138-kV transmission line between E 2100 S and E 2200 S.

This new line would have a tap at W 100 S following the preferred line route east to Jerome Substation.



Area 2: West Valley—South of Snake River

Figure 3: West Valley—South of the Snake River

Preferred Options

In the West Valley, south of the Snake River, the Committee proposed preferred locations for six new distribution substations and the connecting 138-kV transmission line routes.

Preferred Substation Locations

Distribution Substation 4 (Sub 4)

Southeast section of E 4200 N and N 950 E

Distribution Substation 5 (Sub 5)

Northeast section of E 3500 N and N 2500 E

Distribution Substation 6 (Sub 6)

Northeast section of E 3500 N and N 2900 E

Distribution Substation 7 (Sub 7)

Northeast section of E 3500 N and N 3400 E

Distribution Substation 8 (Sub 8)

East side of N 3300 E and in line with the future Filer Road extension

Distribution Substation 9 (Sub 9)

Northwest section of E 4200 N and N 1900 E

Preferred 138-kV Transmission Line Routes

Upper Salmon-Cliff 138-kV transmission line to Sub 4

Tap the existing Upper Salmon–Cliff 138-kV transmission line near the intersection of N 1000 E and Sawyer Rd, and build a 138-kV transmission line south on N 1000 E (River Rd), following the existing 69-kV transmission line route. Continue south on Highway 30 (Thousand Springs Scenic Byway), turn west on E 4300 N, and turn south on N 950 E to Sub 4.

➤ Uses an existing transmission line route

Northview Substation to Sub 4

Build a 138-kV transmission line west out of Northview Substation along E 4200 N to Sub 4. Provides two sources to Sub 4.

Northview Substation to Sub 9

Build a 138-kV transmission line east out of Northview Substation along E 4200 N to Sub 9.

Sub 9 to Clover Substation

Build a 138-kV transmission line south out of Sub 9 along N 1900 E, turning east on E 3550 N to Clover Substation.

Sub 9 to Filer Tap

Build a 138-kV transmission line east out of Sub 9 along E 4200 N. Turn south on N 2100 E. Turn east on E 4100 N to the Filer Tap on N 2300 E.

> The first three miles of the line route follow an existing transmission line route.

Filer Tap to Filer Substation

Build a 138-kV transmission line south from the Filer Tap (intersection of E 4100 N and N 2300 E) along N 2300 E to Filer Substation.

Filer Tap to Pole Line Substation

Build a 138-kV transmission line east from the Filer Tap (intersection of E 4100 N and N 2300 E) along E 4100 N and continuing along Highway 93 (Pole Line Rd) to Pole Line Substation.

Filer Substation to Clover Tap

Build a 138-kV transmission line south from Filer Substation along N 2300 E to the Clover Tap at E 3600 N.

Uses an existing transmission line route

Clover Tap to Clover Substation

Build a 138-kV transmission line west from the Clover Tap (intersection of N 2300 E and E 3600 N) along E 3600 N, turning south on N 2100 E, and west on E 3550 N to Clover Substation.

> Provides two sources to Clover Substation, and uses an existing transmission line route.

Clover Tap to Sub 5 Tap

Build a 138-kV transmission line south from the Clover Tap (intersection of N 2300 E and E 3600 N) along N 2300 E to Sub 5 Tap at E 3500 N.

Uses an existing transmission line route

Sub 5 Tap to Amsterdam Tap

Build a 138-kV transmission line south from the Sub 5 Tap (intersection of N 2300 E and E 3500 N) along N 2300 E to the Amsterdam Tap at E 3100 N.

Uses an existing transmission line route

Amsterdam Tap to Amsterdam Substation

Build a 138-kV transmission line south from the Amsterdam Tap (intersection of N 2300 E and E 3100 N) along N 2300 E. Turn east on E 2450 N and south on N 2400 E (Highway 93) to Amsterdam Substation.

Uses an existing transmission line route

Source 2 to Amsterdam Tap

Build a double-circuit, 138-kV transmission line east from Source 2 along E 3100 N to N 2300 E. One circuit will connect to the 138-kV line headed north on N 2300 E. The other circuit will connect to the 138-kV line headed south on N 2300 E.

Sub 5 Tap to Sub 5

Build a 138-kV transmission line east from the Sub 5 Tap (intersection of E 3500 N and N 2300 E) along E 3500 N to Sub 5.

Sub 5 to Sub 6

Build a 138-kV transmission line east from Sub 5 along E 3500 N to Sub 6.

Sub 6 to Eastgate Substation

Build a 138-kV transmission line east from Sub 6 along E 3500 N, turning north along N 3100 E. Continue to Eastland Dr. S, turning west on Highland Ave E to Eastgate Substation.

> Provides better reliability to the industrial area.

Source 1 to Artesian Substation

Build a 138-kV transmission line north from Source 1 along N 4100 E, turning east on E 3000 N to Artesian Substation.

Artesian Substation to Sub 7 Tap

Build a 138-kV transmission line north from Artesian Substation along N 4200 E to where the existing 46 kV transmission line turns west (in line with E 3400 N).

Uses an existing transmission line route

Sub 7 Tap to Sub 7

Build a 138-kV transmission line west from the Sub 7 Tap along the existing 46 kV transmission line route (in line with E 3400 N), turning north on N 3800 E. Turn west on E 3500 N to Sub 7.

> Part of this route uses an existing transmission line route.

Sub 7 Tap to Eden Substation

Build a 138-kV transmission line north from the Sub 7 Tap (intersection of N 4200 E and in line with E 3400 N) along N 4200 E to Eden Substation.

Uses an existing transmission line route

Sub 7 to Kimberly Substation

Build a 138-kV transmission line north from Sub 7 along N 3400 E to Kimberly Substation near Highway 30 (Kimberly Rd).

Alternative Options

The Committee selected alternative options for two future substations:

Sub 6 Alternative

Southeast section of E 3500 N and N 2800 E.

Sub 8 Alternative

In line with Elizabeth Blvd and north of the Norris Ponds (half a mile north of Kimberly Rd between N 3200 E and N 3300 E).

The Committee also selected alternative line routes for the following transmission line sections:

Sub 9 to Filer Tap Alternative

Build a 138-kV transmission line east from Sub 9 along E 4200 N, turning south on N 2100 E. Turn east on E 4000 N to Filer Tap on N 2300 E.

Filer Tap to Pole Line Substation Alternative

Build a 138-kV transmission line east from Filer Tap (intersection of E 4000 N and N 2300 E) along E 4000 N, turning north on N 2600 E. Turn east on E 4100 N (Pole Line Rd) to Pole Line Substation.

Source 1 to Artesian Substation Alternative

Build a 138-kV transmission line east from Source 1 along E 2900 N, turning north on N 4200 E to Artesian Substation.

Area 3: East Valley



Figure 4: East Valley

Preferred Options

In the East Valley, the buildout loads did not require new distribution substations. The Committee proposed preferred locations for 138-kV transmission line routes.

Preferred 138-kV Transmission Line Routes

Artesian Substation to Lake Substation

Build a 138-kV transmission line east from Artesian Substation along E 3000 N to Lake Substation at N 4900 E.

Provides another source into the East Valley.

Lake Substation to Buckhorn Substation

Build a 138-kV transmission line east from Lake Substation along E 3000 N, turning south on S 1000 W, following the existing 69-kV transmission line route and continuing south on S 1100 W to Buckhorn Substation on W 1300 S.

Uses an existing transmission line route and provides two sources to Lake Substation.

Buckhorn Substation to Island Tap

Build a 138-kV transmission line east from Buckhorn Substation along W 1300 S to the Island Tap (intersection of W 1300 S and S 700 W).

This requires installation of a substation and a transformer near the Island Tap to convert the voltage from 138 kV to 69 kV to serve Island Substation and Oakley Substation.

This option is less expensive than converting Island Substation and Oakley Substation to 138-kV operation.

Island Tap to Kenyon Tap

Build a 138-kV transmission line north from the Island Tap (intersection of W 1300 S and S 700 W) along S 700 W, turning east on W 800 S to the Kenyon Tap (intersection of W 800 S and S 500 W).

Uses an existing transmission line route

Kenyon Tap to Kenyon Substation

Build a 138-kV transmission line east from the Kenyon Tap (intersection of W 800 S and S 500 W) along W 800 S to Kenyon Substation (intersection of W 800 S and S 50 W).

Uses an existing transmission line route

Kenyon Tap to Golden Valley Substation

Build a 138-kV transmission line north from the Kenyon Tap (intersection of W 800 S and S 500 W) along S 500 W to Golden Valley Substation (intersection of W 600 S and S 500 W).

Uses an existing transmission line route

Golden Valley Substation to Burley Rural Tap

Build a 138-kV transmission line west from Golden Valley Substation (intersection of W 600 S and S 500 W) along W 600 S, turning north on S 600 W to the Burley Rural Tap (intersection of Highway 30 and S 600 W).

➤ Uses an existing transmission line route

Burley Rural Tap to Burley Rural Substation

Build a 138-kV transmission line northeast from the Burley Rural Tap (intersection of Highway 30 and S 600 W) along Highway 30 to Burley Rural Substation near the intersection of Highway 30 and S 300 W.

Uses an existing transmission line route

Burley Rural Substation to Heyburn Substation

Build a 138-kV transmission line north from Burley Rural Substation (near the intersection of Highway 30 and S 300 W) along S 300 W and crossing the Snake River. Continue north on S 950 W, turning east on W 400 S. Continue west on E 5th St N and then on 21st St to Heyburn Substation near the intersection of 21st St and Highway 30.

> Increases reliability by bringing an additional source into the East Valley.

Burley Rural Tap to Milner Substation

Build a 138-kV transmission line west from Burley Rural Tap (intersection of Highway 30 and S 600 W), following the existing 46 kV line route to Milner Substation near the intersection of E 3610 N and N 5250 E.

Uses an existing transmission line route

Wilson Butte Tap to Wilson Butte Substation

Build a 138-kV double-circuit transmission line south from the Wilson Butte Tap (intersection of E 1100 S and S 2000 E) along S 2000 E, turning east on E 1300 S to Wilson Butte Substation near the intersection of E 1300 S and S 2150 E.

Increases reliability to Wilson Butte Substation

Alternative Options

The Committee also selected alternative line routes for the following transmission line sections.

Milner Substation to the Lake Tap Alternative

Build a 138-kV transmission line south from Milner substation (near the intersection of E 1300 S and S 2150 E) along S 1100 W, following the existing 46 kV transmission line route. Continue south on S 1000 W to the Lake Tap (S 1000 W and in line with E 3000 N).

Uses an existing transmission line route

Burley Rural Tap to Burley Rural Substation Alternative

Build a 138-kV transmission line east from the Burley Rural Tap (intersection of W 200 S and S 600 W) along W 200 S, turning north on S 300 W to Burley Rural Substation near the intersection of Highway 30 and S 300 W.

> Avoids Highway 30 and uses an existing transmission line route

Appendix A Community Goals and Siting Criteria

As a first step in determining the feasibility of individual line routes and substation locations, the Original Committee created community goals and siting criteria to guide their choices for the various alternatives they developed. The Committee reviewed the community goals and siting criteria from the Original Committee and made additions and revisions as needed. The updated community goals and siting criteria are divided in to six areas and are not weighted or prioritized by order.

- **Reliability (Dependability).** Provide reliable (dependable) electric service to all Idaho Power customers in the Magic Valley service area.
 - Provide adequate system capacity to satisfy N-1 conditions (for main grid transmission) throughout the Magic Valley service area.
 - Provide redundant systems that deliver a minimum of N-1 capability (for transmission lines with voltages of 230 kV or higher) throughout the Magic Valley service area.
 - Continue maintenance and operation programs that ensure optimum reliability.
- Efficiency. Plan, manage, and operate the Magic Valley electrical system for optimum efficiency.
 - Plan and develop efficient systems that require fewer new lines, fewer line miles and fewer substations, including consideration for distributed generation.
 - Maintain reasonable costs to customers for electrical service.
- Energy Conservation. Optimize conservation of electrical energy resources.
 - Design and operate the electrical system to conserve electricity.
 - *Provide effective public education programs regarding efficient use of electricity, conservation, etc.*
 - Develop and offer all feasible and applicable energy conservation programs and incentives throughout the Magic Valley service area.
 - Encourage energy efficient design and operation in new building construction.
- Environment. Avoid or minimize impacts to the environment from the electrical system.
 - Actively seek opportunities to utilize generation resources in the Magic Valley.
 - Avoid negative impacts from electrical facilities and system operation on the natural environment, sensitive resources, and wildlife habitat; mitigate unavoidable negative impacts where appropriate.
 - Avoid or minimize the negative aesthetic and visual impacts caused by the development and operation of electrical system facilities; mitigate unavoidable negative impacts where appropriate.

- Do not build/operate electrical facilities in designated scenic byways or that negatively affect other tourism assets.
- Support the burying of electrical transmission lines where feasible to avoid undesired visual impacts, and support desired community design and function.
- Avoid negative impacts and interference to agricultural lands and operations; mitigate negative impacts where appropriate.
- Seek opportunities to incorporate renewable power generation when feasible.
- **Planning and Design.** Plan and design of electrical system facilities that effectively meet the Magic Valley's current and future electrical demands.
 - Identify and accommodate the electrical needs of defined growth areas.
 - *Minimize the physical "footprint" of electrical facilities.*
 - Use distributed generation wherever feasible to minimize the amount and extent of new electrical facilities.
 - Upgrade or expand existing electrical facilities wherever feasible to minimize the need for new facilities.
 - Incorporate multiple lines (transmission and distribution) on each pole system when feasible to reduce the need for additional or new pole systems.
 - Accommodate/incorporate the use of cogeneration projects as much as feasible, while meeting other system goals.
 - Protect and minimize impact to existing structures from new facility design.
 - Strategically plan, design, and build facilities with consideration of future projections and anticipated needs.
 - Seek opportunities to co-locate electrical facilities wherever possible (i.e., co-locating a source substation with a distribution station).
- **Siting.** Site new facilities with an effective balance between system needs and area resident concerns.
 - Use existing electrical and transportation corridors where feasible when siting new electrical transmission facilities.
 - Avoid siting new facilities in residential areas.
 - Place substations out of developed areas where feasible.
 - Site new substations early to minimize conflicts with development.
 - Continue coordinating Idaho Power's efforts with local counties and cities to ensure consistency with development and zoning plans.

Appendix B Group Alternatives



GROUP 1 MAPPING RESULTS

Figure 5: Group 1 West Valley—North of the Snake River mapping results

Group 1 Mapping Notes—West Valley, North of the Snake River

In the West Valley, north of the Snake River, Group 1 proposed locations for three new substations and the connecting 138-kV line routes.

Proposed Substation Locations

Sub 1

Highway 75 and E 520 N (East of Little Lake and East side of Highway)

 Accessible to Idaho Power, easy connectivity to existing power lines and most cost-effective location

Sub 2

Highway 30 and N 1300 E ("Back 30" on north side of the road)

 Location is in a commercial area away from residential areas and is not visible from the roadway.

Sub 3

E 3300 S (West Rd) and S 2400 E (County Line Rd)

Location can be any side of the intersection. Area has good access for maintenance and could provide service to local dairies. Currently, there isn't any development and there are no environmental concerns.

Proposed 138-kV Transmission Line Routes

Shoshone Substation to Sub 1

Build a 138-kV transmission line north from Shoshone Substation along Highway 75 to Sub 1.

Co-locate the transmission line with the existing distribution lines.

Sub 2 Transmission Line

Tap the existing 138-kV transmission line at the intersection of E 400 S and S 200 E. Build a 138-kV transmission line east along E 400 S. Turn south at S 300 E. The new line will continue south and turn east at Crossroads Point Blvd to Sub 2.

The transmission line doesn't cross I-84.

Sub 3 In-and-Out Transmission Lines

Build a 138-kV transmission line south on S 1950 E. Turn east on E 3300 S (West Road) to Sub 3. Build a 139-kV transmission line west out of Sub 3 along E 3300 S (West Road). Turn south at S 2000 E and connect to the existing transmission line near the intersection of E 3400 S and S 2000 E.

Follows a transmission line route proposed by the Original Committee



Figure 6: Group 1 West Valley—South of the Snake River mapping results

Group 1 Mapping Notes—West Valley, South of the Snake River

In the West Valley, south of the Snake River, Group 1 proposed locations for six new distribution substations and the connecting 138-kV transmission line routes.

Proposed Substation Locations

Sub 4

E 4150 N and N 1300 E

 Located away from the Scenic Byway, but near the growing Highway 30 corridor. Area provides easy access for maintenance.

Sub 5

E 3500 N and N 2400 E

Any corner of the intersection except the northwest corner. Ground is very rocky and not prime land for real estate.

Sub 6

E 3500 N and N 2900 E

Close to the airport and future industrial growth. Important that the aesthetics of the substation be integrated into the surrounding area.

Sub 7

E 3500 N and N 3300 E

Locate on either the northeast or northwest corner of the intersection. Currently there isn't any development in the area. The location is near existing distribution line.

Sub 8

N 3300 E and Addison Ave

Locate on any corner of the intersection. The location is not prime real estate and is not on an intersection a traveler would naturally drive past.

Sub 9

Northwest corner of E 4200 N and N 1900 E

The location is land-locked by the roadway and a canal; it has access to the Northview transmission line and supports the original Magic Valley Electrical Plan.

Proposed 138-kV Transmission Line Routes

Transmission lines for Subs 4–9

Group 1 chose to follow transmission line routes proposed by the Original Committee for all transmission lines connection to Subs 4–9.

Alternative Substation Location

In the West Valley, south of the Snake River, Group 1 proposed an alternative location for Sub 6.

Sub 6 Alternative

E 3400 N and N 2900 E

Close to the airport and future industrial growth. Important that the aesthetics of the substation be integrated into the surrounding area.



Figure 7: Group 1 East Valley mapping results

Group 1 Mapping Notes—East Valley

In the East Valley, the buildout loads did not require new distribution substations. Group 1 chose to follow transmission line routes proposed by the Original Committee in the East Valley.

GROUP 2 MAPPING RESULTS



Figure 8: Group 2 West Valley—North of the Snake River mapping results

Group 2 Mapping Notes—West Valley, North of the Snake River

In the West Valley, north of the Snake River, Group 2 selected proposed locations for three new substations and the connecting 138 kV line routes.

Proposed Substation Locations

Sub 1

Northwest corner of E 520 N and ¼ mile east of Highway 75

Sub 2

Highway 93 and Crossroads Blvd

➤ Location is close to the business park.

Sub 3

E 3300 S (West Rd) and S 2400 E (County Line Road)

Location avoids impacting farm ground.

Alternative Substation Location

In the West Valley, north of the Snake River, Group 2 proposed alternative locations for Subs 2 and 3.

Sub 2 Alternative

- E 400 S and S 380 E
 - Property should be inexpensive.

Sub 3 Alternative

Northwest corner of E 3200 S and S 2400 E

Location avoids impacting farm ground.



Figure 9: Group 2 West Valley—South of the Snake River mapping results

Group 2 Mapping Notes—West Valley, South of the Snake River

In the West Valley, south of the Snake River, Group 2 proposed locations for six new distribution substations and the connecting 138 kV transmission line routes.

Proposed Substation Locations

Sub 4

E 4200 N and N 1300 E

Any corner would work, but the northwest corner is preferred.

Sub 5

E 3500 N and N 2400 E

Sub 6

E 3500 N and N 2900 E

Any corner of the intersection is acceptable. These are currently pivot corners without any homes.

Sub 7

E 3500 N and N 3300 E

> There are no pivots or irrigated fields at this location.

Sub 8

N 3300 E and E 3925 N

Sub 9

Northwest corner of E 4200 N and N 1900 E

Alternative Substation Locations

Group 2 also proposed alternative locations for Subs 4, 7, and 9.

Sub 4 Alternative 1

Northwest corner of N 1300 E and E 4200 N

Sub 4 Alternative 2

Northeast corner of N 1200 E and E 4200 N

Sub 7 Alternative

Southeast corner of E 3500 N and N 3400 E

Sub 9 Alternative

Northwest corner of E 4200 N and N 2000 E

Figure 10: Group 2 East Valley mapping results

Group 2 Mapping Notes—East Valley

In the East Valley, the buildout loads did not require new distribution substations. Group 2 requested that Idaho Power upgrade the transmission lines in place as required by growth.

GROUP 3 MAPPING RESULTS

Figure 11: Group 3 West Valley—North of the Snake River mapping results

Group 3 Mapping Notes—West Valley, North of the Snake River

In the West Valley, north of the Snake River, Group 3 selected proposed locations for three new substations and the connecting 138 kV line routes.

Proposed Substation Locations

Sub 1

Highway 75 and E 520 N

Location is accessible along the highway.

Sub 2

Highway 93 and Crosspoints Blvd

Location is in a future commercial area and avoids residential areas.

Sub 3

West side of E 3300 S (West Rd) and S 2400 E (County Line Rd)

> Land availability is highest on the west side of the intersection.

Figure 12: Group 3 West Valley—South of the Snake River mapping results

Group 3 Mapping Notes—West Valley, South of the Snake River

In the West Valley, south of the Snake River, Group 3 proposed locations for six new distribution substations and the connecting 138 kV transmission line routes.

Proposed Substation Locations

Sub 4

Highway 30 and N 1000 E

Sub 5

E 3500 N and N 2500 E

✤ Location is not near the canal and is currently vacant.

Sub 6

E 3500 N and N 2800 E

> Avoids Washington St and is in-line with South Park.

Sub 7

E 3500 N and N 3400 E

> Location provides an easy connection to Kimberly substation.

Sub 8

Southwest corner of N 3400 E and E 4000 N

Location is south of Falls Ave, and development is already occurring in most of the surrounding areas.

Sub 9

E 4200 N and N 1900 E

Location is in a straight line from the Northview and Clover substations.

Figure 13: Group 3 East Valley mapping results

Group 3 Mapping Notes—East Valley

In the East Valley, the buildout loads did not require new distribution substations. Group 3 proposed upgrading the existing transmission lines as well as building a new transmission line between Buckhorn substation and the Island Tap along W 1300 S.