APPENDIX A

2006 Initial Study/Mitigated Negative Declaration

Initial Study and Mitigated Negative Declaration of Environmental Impact

Foss Creek Pathway
Healdsburg, California

CITY OF HEALDSBURG
CALIFORNIA SINCE 1867

Project Sponsor	City of Healdsburg
Date	July 11, 2006
Lead Agency	City of Healdsburg Planning & Building Dept.
Prepared by	Robert Jones, AICP - Earthcraft Planning Services Lynn Goldberg, AICP - City of Healdsburg

Initial Study

This Initial Study has been prepared consistent with CEQA Guidelines Section 15063 to determine if this proposed project may have a significant impact upon the environment.

Project title	Foss Creek Pathway
Lead agency name and address	City of Healdsburg 401 Grove Street Healdsburg, CA 95448-4723
Contact person and phone number	Lynn Goldberg, AICP (707) 431-3332
Project location	Alongside Northwestern Pacific Railroad and Foss Creek
Project sponsor	City of Healdsburg
General Plan designations	Various
Zoning District	Various

Project Description

Project Location

The Foss Creek Pathway will be a Class I (off-street) paved bike and pedestrian path that will parallel Foss Creek and/or the Northwestern Pacific Railroad through most of the city. As shown in Figure 1, the alignment for this pathway extends from Front Street at its south end to the north end of Healdsburg, for a distance of approximately 4.1 miles.

Project Objectives

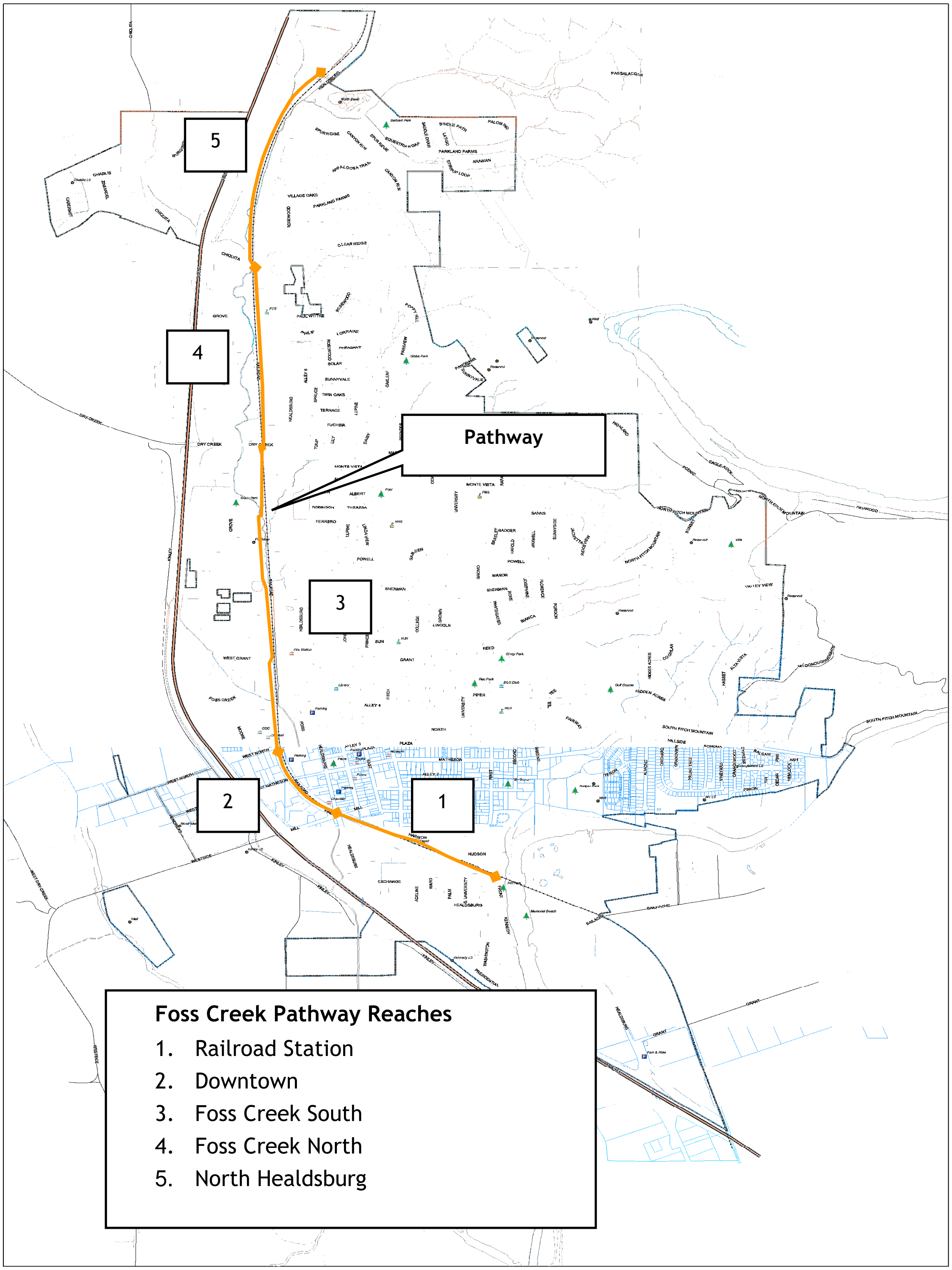
The project is intended to provide both a non-motorized transportation as well as a recreational facility that will connect major city destinations, including nearby residential areas, employment centers, the downtown district, Healdsburg Intermodal Transit (Railroad) station, Memorial Beach Park and the Carson Warner Memorial Skate Park. The pathway will also connect with existing (and planned) bicycle paths and lanes located in rural Alexander Valley and Dry Creek Valley. A major section of the path is planned to be adjacent to Foss Creek, and will provide the public with new and enhanced opportunities to view the riparian habitat and creek environment which runs through much of Healdsburg.

Pathway and Associated Improvements

The following summarizes the principal design features of the proposed pathway.

Width. The paved width of the Foss Creek Pathway will be 12 feet with 2-foot shoulders on each side and 10 feet of vertical clearance. In locations where right-of-way constraints prevent the development of the 12-foot standard, a 10- or 8-foot paved cross section with 2-foot shoulders may be implemented. Narrower pathway widths may be used between the Depot and Matheson Street and West Grant Street and the Foss Creek Detention Basin due to right-of-way constraints.

Figure 1 – Proposed Pathway Alignment



Structural section. It is currently anticipated that the structural cross section for the Foss Creek Pathway will be three inches of Type A or Type B asphalt as described by Caltrans Standard Specifications, with three-quarter inch minus aggregate base. This structural cross section is meant to withstand maximum pathway loads that will include city, railroad, and Geysers Pipeline maintenance vehicles, emergency vehicles, and occasional construction equipment. The specification for sub-base thickness will be determined by soils conditions. Where encountered, expansive soil types will require special structural sections.

Signing and marking. The Foss Creek Pathway will be designed to include all of the required and recommended signing and marking standards developed by Caltrans in Chapter 1000 of the Highway Design Manual. In addition, all signs and markings will conform to the standards developed in the Manual of Uniform Traffic Control Devices (MUTCD). It is expected that the final striping, marking, and signing plan for the Foss Creek Pathway will be reviewed and approved by a licensed traffic engineer or civil engineer. Finally, the Foss Creek Pathway will be identified by a consistent, unique logo or design that will help guide people to and on the trail.

In general, all signs will be located three to four feet from the edge of the paved surface, have a minimum vertical clearance of 8.5 feet when located above the pathway surface and be a minimum of four feet above the paved surface when located on the side of the pathway. All signs will be oriented so as not to confuse motorists. The designs (though not the sizes) of signs and markings will be the same as used for motor vehicles.

An optional four-inch yellow centerline stripe may be used to separate users on the bike path. Such stripes may be used on sections of the pathway that have heavy usage or curves with restricted sign lines, at approaches to intersections, and/or where nighttime riding is expected.

Entrance signs will include regulations, hours of operation (if any) and trail speed limit. Interpretative signs may be placed at the entrances or at appropriate locations along the trail that provide brief descriptions of historic events or natural features.

Associated drainage improvements. A two-percent cross slope will be used for the pathway, except along cut sections where runoff water must be collected in a ditch and directed to a catch basin, and where the water can be directed under the bike path in a drainage pipe of suitable dimensions. An existing inadequate drainage ditch will be converted to a culvert below the pathway just north of Front Street. New culverts will be needed where the pathway will cross existing drainage ditches along the railroad right-of-way, and in some areas, the ditches may need to be realigned.

Roadway crossings. All pathway crossings of roadways will occur at-grade. Proposed crossing types by intersection are identified in the table shown below.

Foss Creek Pathway Crossings and Proposed Crossing Types

Crossing	Crossing Type
Healdsburg Ave./Mill St./Vine St.	Signalized Controlled Pedestrian Flasher
Matheson Street	Unprotected Type I
North Street	Unprotected Type I
West Grant Street	Signalized Controlled Pedestrian Flasher
Dry Creek Road	Signalized Controlled Pedestrian Flasher

Unprotected Type I is defined as a crossing using a crosswalk over a roadway. At the proposed uncontrolled crossings of Matheson Street and North Street, crossings will occur at existing pedestrian crossings on the east side of Vine Street at intersections that are four-way stop sign controlled.

For roads with higher traffic volumes, the crossings will utilize the Signalized Controlled Pedestrian Flasher type that allows cyclists and pedestrians desiring to cross the roadway to activate a signal stopping vehicular traffic. These crossings include two mid-block crossings, on West Grant Street and Dry Creek Road, and an intersection crossing at Healdsburg Avenue/Mill Street/Vine Street.

Railroad track crossings. The proposed pathway alignment will require rail crossings at two locations: 1) the Vine Street, Mill Street, Healdsburg Avenue intersection and 2) Dry Creek Road. Each of these locations will utilize existing roadway/pedestrian grade crossings.

Pathway setback and separation from railroad tracks. The pathway will be set back at least 15 feet from the railroad track and be separated from the track by a fence typically five to six feet in height (increased to seven to eight feet where the path is lower than the rail level). The fence will likely consist of chain link fencing with climbing vines to form a solid barrier. A solid barrier fence is needed to discourage pathway users from trespassing onto the railroad tracks, and to protect pathway users from dragging or loose equipment on trains; flying objects propelled by moving trains, dust and other windblown objects; and concussive force of winds generated by high-speed trains. No fencing would be needed where the pathway will continue around the north side of the existing railroad depot or in the vicinity of the Grove Street Detention Basin where the pathway would parallel the west side of Foss Creek rather than the railroad track.

Lighting. Lighting will be provided along the entire pathway. The 175-watt metal halide fixtures will have refractive lenses and provide a minimum.6 footcandle of light throughout the path. Photocells will automatically control the lights’ operation.

Pathway entrance features. Entrance features will typically include signs or kiosks, bollards (to keep out vehicular traffic and slow bikes at intersections), landscaping, drinking fountains and benches. No restroom facilities are proposed as part of this project. Proposed entrance feature locations include the south end of the pathway at Front Street, where the pathway would cross Healdsburg Avenue/Mill Street intersection, and at the north end of the pathway at the Grove Street/Healdsburg Avenue intersection.

Landscaping. Landscaping will include trees, shrubs and groundcovers at pathway entrance locations, vines or shrubs to conceal the protective fence separating the pathway from the railroad track, and habitat enhancement or mitigation along adjacent sections of Foss Creek. Landscaping will be installed using temporary irrigation systems for use until plants are established. Emphasis will be on the use of native and low-maintenance plants.

Bridge crossings. The pathway will cross both Norton Slough and Foss Creek, as further described below. The type of bridge design for these two locations has not been determined, but is expected to provide a clear span crossing rather than utilize culverts. The abutments would be located outside the ordinary high water mark of banks to prevent any obstruction of fish and/or floodwaters.

Parking. Parking for those arriving by vehicle to use the pathway will be available on-street along Front Street at the south end of the project, at the proposed park-and-ride lot at the railroad depot, and at the West Plaza parking lot. A park-and-ride lot is also available at the south end of Healdsburg Avenue, connected to the south end of the pathway at Front Street by Class II bike lanes on Healdsburg Avenue. At this time, no additional parking facilities are proposed as part of this project.

Utilities. Surface and sub-surface utilities are located within the railroad right-of-way, and may impact the location and construction of the Foss Creek Pathway. Known utilities include active and abandoned railroad communications; cable, signal and communication boxes; fiber optic cable; and The Geysers pipeline. The Foss Creek Pathway would be designed to avoid having to move most active surface utilities, although utility poles no longer in use may be removed. The pathway may be located directly over existing sub-surface utilities assuming (a) adequate depth exists between the trail surface and utility to prevent damage and (b) agreements can be reached with the utility owner regarding access for repairs and impact to the trail.

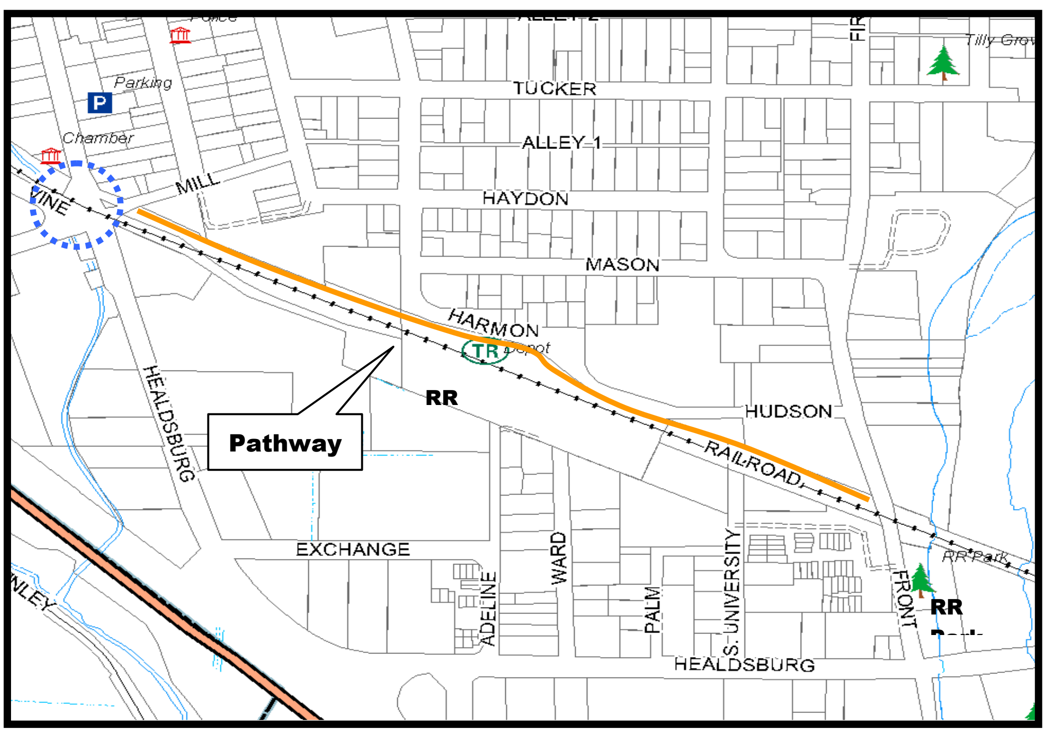
Proposed Pathway Alignment

The following is a description of the proposed pathway alignment and the location of associated improvements, ranging from south to north:

- Railroad Station Reach (Front Street to Healdsburg Avenue)

The pathway will start on the west side of Front Street, along the north side of the railroad tracks. It will end just east of the existing railroad depot located on Harmon Street, and restart west of the depot. Signs will be posted to direct pedestrians and cyclists through this area. This railroad depot is currently in the process of being restored as a separate project for use as a multi-modal transportation facility by Sonoma County Transit. A NEPA Categorical Exemption has been prepared that evaluates the potential environmental impacts of that project.

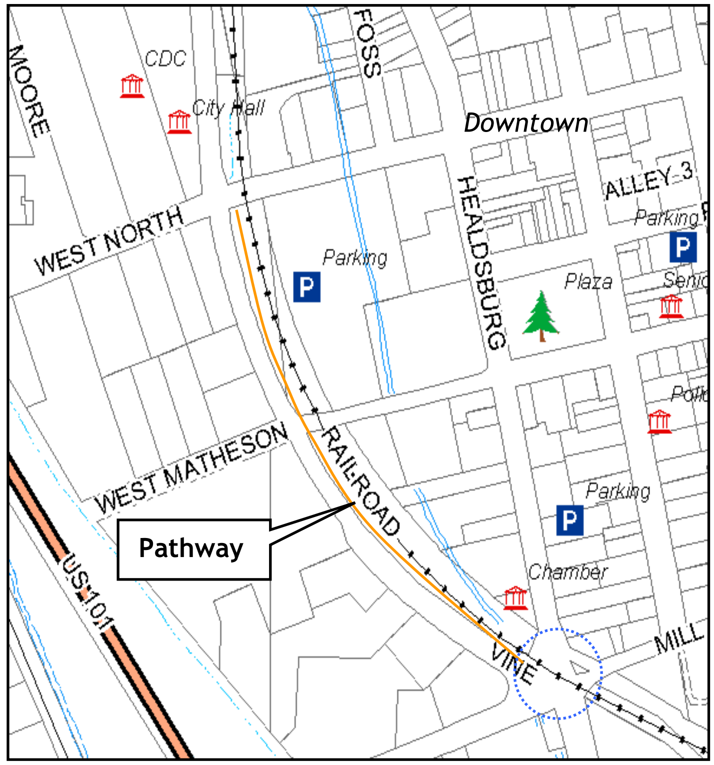
At Front Street, the south end of the path would tie in to existing Class II bike lanes along Healdsburg Avenue south of the Russian River. This connection will utilize a Class III (signed bike route) along Front Street and over the bridge crossing the river since both Front Street and the bridge are too narrow to accommodate bike lanes. A long-term alignment could include a bike path paralleling the railroad on the other side of the river, but this would necessitate a new bridge crossing over the river. As such, this long-term alignment is not part of this project and is not assessed in this Initial Study.



Railroad Station Reach

- Downtown Reach (Healdsburg Avenue to North Street)

At the intersection of Healdsburg Avenue, Mill Street, the railroad tracks and Vine Street, the pathway would utilize existing pedestrian crossings to connect with the east side of Vine Street. A roundabout is being considered for this intersection by the City for possible long-term implementation, and additional study will be needed to determine the best means of crossing in conjunction with the roundabout design. However, it is likely that with the roundabout, the pathway would also use pedestrian crossings to cross both Mill Street and Healdsburg Avenue.



Downtown Reach

This 1,555-foot long section of the pathway paralleling Vine Street, was completed in 2005. Its alignment meanders between the railroad track and Vine Street. The pathway crosses Matheson and North Streets using the existing pedestrian crossings on the east side of Vine Street at these intersections, which are four-way stop sign controlled.

- Foss Creek South Reach (North Street to Dry Creek Road)

At North Street, Vine Street becomes Grove Street. The pathway will continue on a meandering alignment north of North Street, along the west side of the railroad. Where Grove Street begins to curve toward the west, the pathway will cross Norton Slough just west of where the slough joins Foss Creek, which is located east of the railroad track. It will then continue north along the west side of the track and crosses a drainage ditch through property recently purchased by the City of Healdsburg for affordable housing, to West Grant Street.

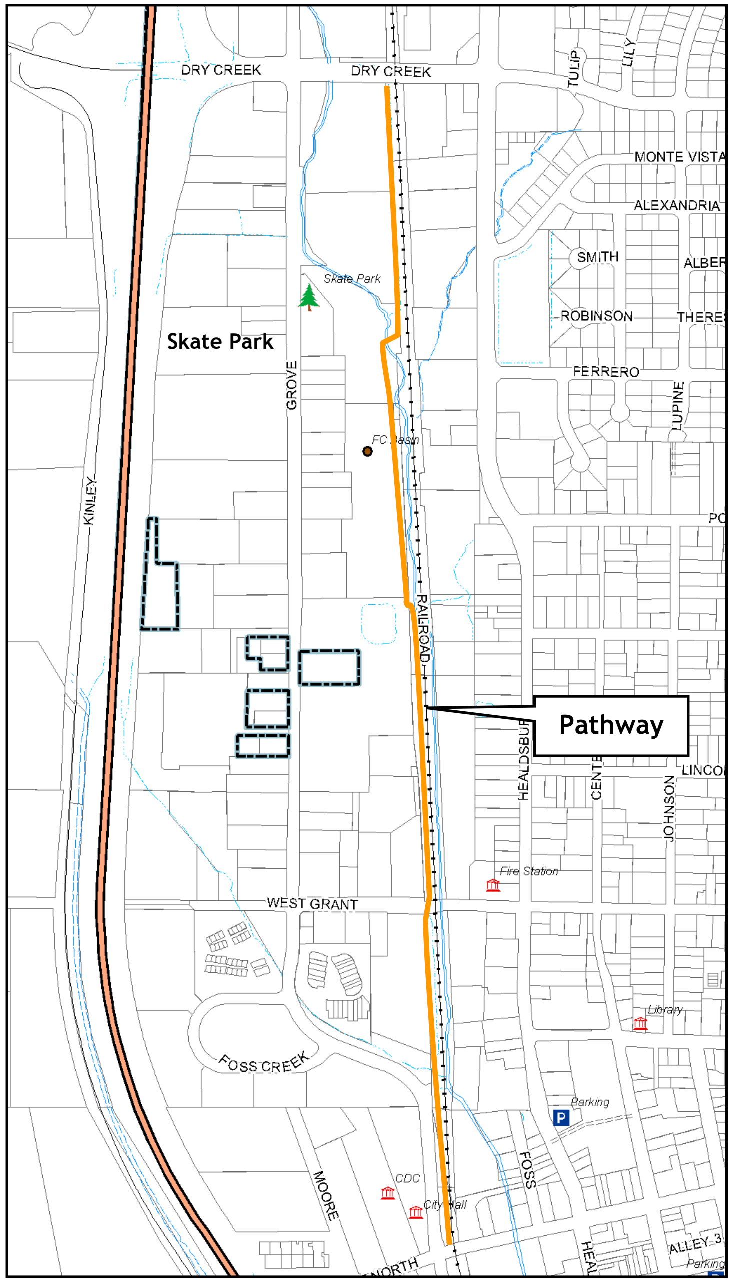
The path will then cross West Grant Street using a signalized protected crossing and continue on the west side of the railroad track between the track and three existing industrial buildings (Evans Design Group and McIntyre Tile Company). Beyond these buildings, the pathway will continue past the east side of the Seghesio Winery wastewater treatment pond, between the pond and the railroad track. The pathway will traverse the eastern embankment of this pond, using a 435-foot long retaining wall on the uphill section to reduce the need for cut and fill.

At the north end of this wastewater treatment pond, Foss Creek crosses under the track so that the pathway would be adjacent to the creek's west bank rather than the track. Also north of the Seghesio treatment pond, the pathway enters onto property owned by the City and used for a flood control detention basin. The pathway will then follow along the top of an existing embankment enclosing the east side of this detention basin. At the north end of the detention basin, a spur pathway goes northeasterly along the west bank of Foss Creek to connect with the Carson Warner Memorial Skate Park and Grove Street.

The main pathway will turn east at the north end of the detention basin to cross Foss Creek by a clear span bridge to the east side of the creek. After leaving the area of the detention basin and crossing the creek, the pathway would continue along the west side of the railroad tracks, between an existing industrial use (Empire Mini Storage) to the west and the track to the east and thence between a commercial property used as a vineyard development business and the railroad track to the east, before reaching Dry Creek Road.

- Foss Creek North Reach (Dry Creek Road to Grove Street/ Healdsburg Avenue)

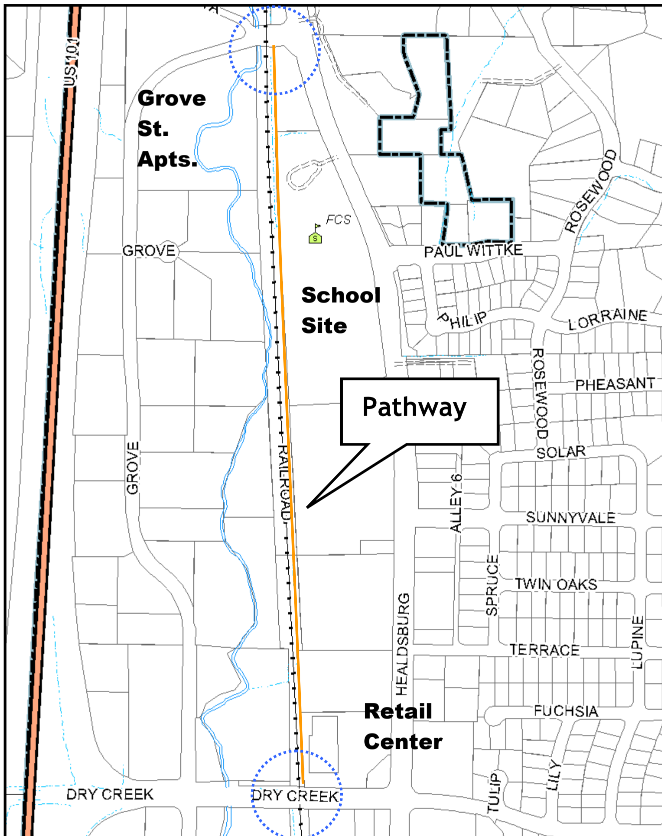
The pathway would cross Dry Creek Road at a location approximately midway between Grove Street and Healdsburg Avenue, using a protected signalized crossing. North of Dry Creek Road, the path would switch to the east side of the track. This segment of the route adjoins commercial properties (Big John's Market, McConnell Chevrolet) and thence a large, mostly-vacant property to the east. North of these commercial or vacant properties facing Healdsburg Avenue, the path would adjoin the west side of the former Foss Creek Elementary School, between the track and the school site. The path would veer east just north of the school property and, after a short distance, end at the southwest corner of Grove Street and Healdsburg Avenue.



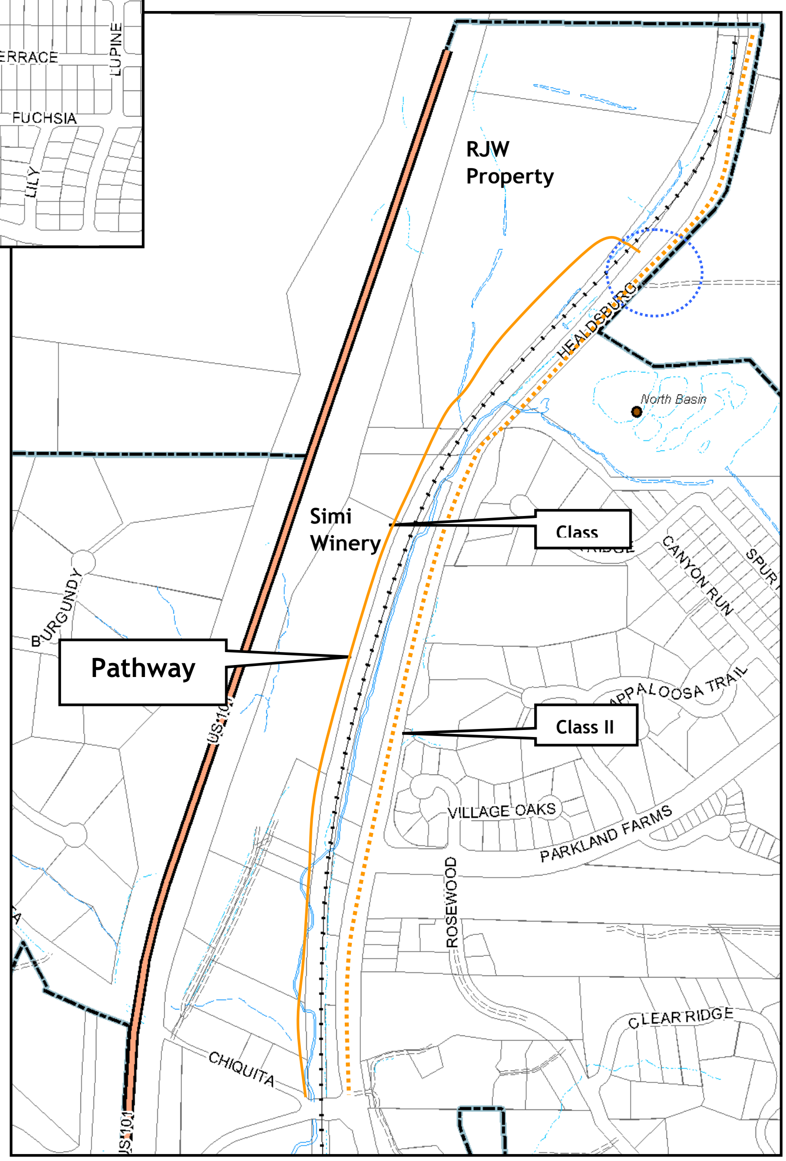
Foss Creek South Reach

- North Healdsburg Reach (Grove Street/Healdsburg Avenue to northerly city limits)

The plan identifies two alignments for this reach. One is a bike lane (Class II) along Healdsburg Avenue and the other is a pathway (Class I) along the west side of the NWP railroad track. Both alignments would cross Grove Street at the nearby Grove Street/Healdsburg Avenue intersection. The bike lane along Healdsburg Avenue would tie into the bike lane on Parkland Farms Boulevard and the bike routes located north of the city in Alexander Valley. This initial study does not evaluate the bike lane alignment because there are no impacts associated with the Class II bike lane within the existing roadway.



Foss Creek North Reach



Healdsburg North Reach

The second alignment would extend the Foss Creek pathway further north along the west side of the NWP. It would bridge Foss Creek where the creek passes under the NWP track at the south end of the Simi Winery property (16275 Healdsburg Avenue). Another bridge would be required to cross the ravine at the north end of the winery complex. The pathway would then traverse the vacant RJW property, exiting the property at an existing railroad crossing and entering the Healdsburg Avenue right-of-way at the north end of the city.

- Phasing and Funding

The Downtown Reach of the pathway was completed in 2005. the Railroad Station Reach is in the engineering design phase, with construction anticipated in 2007. The southernmost segment of the Foss Creek South Reach – from North Street to Norton Slough – is anticipated to be constructed in 2006, followed by the remainder of the segment, to Dry Creek Road, in 2007. It is not known when construction of the Foss Creek North and North Healdsburg reaches would occur, although the City Council has expressed a desire to complete a segment of the pathway each year.

Project Setting

The proposed pathway alignment closely follows the railroad tracks and/or Foss Creek. The grade is generally level throughout the project site. The following describes the environmental setting of the project, including features such as major vegetation, drainage, streets and surrounding land uses.

- Railroad Station Reach

Beginning on the west side of Front Street, the proposed pathway alignment will be located within right-of-way owned by Sonoma Marin Area Regional Transit (SMART), on the north side of the railroad track. SMART is a regional transportation district that oversees the development and implementation of passenger rail service in Sonoma and Marin Counties. The railroad has been out of service since the mid 1990's when flooding and erosion along the tracks caused severe damage to the tracks and was subsequently closed by the Federal Railway Authority in 1998 for reasons of public safety.

Adjacent to the north side of this portion of the railroad right-of-way and the proposed pathway alignment is a complex used by wineries and associated offices (Old Roma Station), while further to the west across Hudson Street is a light industrial use and associated offices (Healdsburg Lumber). Single-family residences exist just north of the depot on Harmon Street.The railroad tracks widen to include spur lines and sidings west of University Avenue (on the south side of the tracks) in the vicinity of the Healdsburg railroad depot. This area includes a former roundhouse turntable on the south side of the tracks.

The pathway would end just east of the Healdsburg railroad depot, located on Harmon Street, and resume west of the depot. The two depot buildings, built in 1928 and considered eligible for inclusion on the National Register of Historic Places, are currently in the process of being cosmetically restored for use as multi-modal transit facility. This project will include parking areas and a park-and-ride lot on a vacant parcel across Harmon Street to the north of the depot. An assessment of the depot and surroundings found no biological or cultural resources in this area (Parr Environmental Services, Inc., March 2001).

Existing land uses adjacent to the proposed pathway alignment west of the railroad depot include a winery (Arista), located on Fitch Street, and a commercial use (E&M Electric) located on Mill Street.

- Foss Creek South Reach

North of the completed Downtown Reach, the pathway would continue north on an alignment parallel to Grove Street within the strip between the street and the railroad track. In general, this section of the railroad track is devoid of trees. Adjacent land uses include Healdsburg City Hall on the west side of Grove Street and the Duchamp Hotel east of the track.

In the vicinity of where Grove Street veers west from a parallel alignment along the railroad track, the proposed pathway will cross Norton Slough within right-of-way owned by the railroad. In the area of this crossing, the riparian vegetation associated with the slough is relatively narrow and consists primarily of blackberry thickets, with a few trees such as scrub willow and Oregon ash. A dense cover of blackberry extends to the north along an unmaintained drainage ditch along the west side of the railroad track.

Extending west from this crossing site, the riparian habitat along Norton Slough is dominated by willow interspersed with a few oaks (valley and live oak), black walnut and Oregon ash. A very dense understory of blackberry, poison oak, elderberry and wild rose is also present, along with non-native species, particularly periwinkle. Norton Slough historically drained a fairly large area; however, with the construction of Highway 101 in the late 1950’s, most of the drainage was cut off and diverted along the western edge of the freeway. Norton Slough currently only receives local runoff from about a four- to five-acre watershed. Aquatic and fisheries resources of Norton Slough are similar to Foss Creek, although Norton Slough regularly dries up in summer, except for possibly a few small isolated pools that may persist.

Surrounding land uses in the vicinity of Norton Slough at the proposed pathway bridge crossing include Montessori School, accessed from Grove Street just to the northwest of the proposed bridge crossing site, and Silveira Pontiac on the east side of Foss Creek and the railroad track.

North of the crossing of Norton Slough, the proposed pathway would utilize the eastern margin of property located at 20 W. Grant Street. This property is presently vacant and owned by the City of Healdsburg, and is planned for use as an affordable housing site. The proposed pathway alignment is situated just west of an existing drainage ditch that extends along the west side of the railroad track and is densely covered with blackberry, with occasional small trees, including willows and oaks. Foss Creek lies further to the east on the other side of the track.

This property was assessed for use as a site for senior housing and an assisted living facility in an initial study prepared by the City of Healdsburg (Earthcraft Planning Services, 1998). This site does not include any known biological or cultural resources and lacks any significant trees or vegetation in the area of the proposed alignment. The site was previously used as a propane gas depot and has been subsequently cleared, awaiting future redevelopment.

Surrounding land uses include single-family residences and a bed and breakfast inn (Calderwood Inn) along West Grant Street to the west and northwest, and the railroad and Foss Creek to the east. A gas station and a commercial shopping center are located further east of Foss Creek adjacent to Healdsburg Avenue.

North of West Grant Street, the alignment would continue to follow the west side of the railroad track. Foss Creek runs along the east side of, and parallel with, the track in this location. To the west of the pathway in this area are commercial and light industrial uses that include Evans Design Group, McIntyre Tile Company and Seghesio Winery. The winery has a wastewater treatment pond to the west of the railroad right-of-way just south of the Grove Street Detention Basin. The east side of the Seghesio Winery property includes an embankment which slopes steeply down to the track, in which there are some native oaks and an understory of poison oak and blackberries. Foss Creek goes under a railroad bridge east of this wastewater treatment pond, so that it parallels the west side of the track north of this location.

In the vicinity of the Grove Street Detention Basin, the proposed pathway follows the western embankment of the detention basin separating it from Foss Creek. This embankment is also used informally as a dog park, and is accessible from Grove Street around a locked gate just north of the Carson Warner Memorial Skate Park. Riparian vegetation along this section of Foss Creek consists of willow, valley and live oak, Oregon ash and black walnut with a dense understory comprised mostly of blackberry and periwinkle. A few eucalyptus trees have also colonized this section of Foss Creek. The riparian woodland trees are noticeably larger and taller toward the north end of the detention basin, with trees appearing more shrubby towards the south end. A washout along the railroad track is also present in the area, since the track is currently unmaintained. An unnamed tributary creek enters Foss Creek on the east side of the railroad track, on the other side of Foss Creek from the proposed pathway alignment.

Most of the top of the embankment that would be used for the pathway, with the exception of the south end, consists of non-native annual grassland and is kept free of encroaching woody vegetation by mowing at the beginning of the dry season to maintain access by the City. The top of the embankment toward the south end of the detention basin provides a section, however, consists of rock rip rap to protect the embankment from overflow flooding from the detention basin to flow back into Foss Creek located to the east. This section has been colonized by woody riparian vegetation such as blackberry, willows and valley oaks.

The southern portion of the detention basin is relatively open, probably due to longer periods of standing water during the winter months inhibiting establishment of woody plant growth. The lowest sections include areas of cattails and other wetland plants such as dock. The surrounding embankments include dwarf coyote brush, and some volunteer young oaks and a eucalyptus tree. The northern portion the detention basin has been colonized by willows, blackberries, and valley and live oak.

This section of Foss Creek is also used as an illegal camping area for migrants and homeless persons. Land uses surrounding the Grove Street Detention Basin include residential along Grove Street to the west, and both residential and commercial along Healdsburg Avenue to the east.

After crossing Foss Creek and leaving the detention basin property, the pathway alignment again enters the railroad right-of-way along the west side of the railroad track. To the west of the pathway alignment and railroad right-of-way is a light industrial use (Empire Mini Storage) accessed by Grove Street and a commercial use facing Dry Creek Road. East of the railroad are various highway commercial uses along Healdsburg Avenue. Foss Creek in this vicinity runs close to Grove Street rather than close to or along the railroad track. Beyond the riparian woodland in the vicinity of Foss Creek, the railroad right-of-way lacks any significant vegetation.

- Foss Creek North Reach

After crossing Dry Creek Road, the proposed pathway alignment shifts to the east side of the railroad, while Foss Creek follows a meandering alignment at a varying distance to the west of the railroad track. Along the pathway alignment east of the track, the section south of McConnell Chevrolet property includes some unmaintained drainage ditches that have been colonized by young oak, Oregon ash and willow. However, the remainder of the alignment all the way to Grove Street has been recently cleared of woody vegetation for construction of The Geysers pipeline project.

Adjacent land uses include highway commercial uses along Healdsburg Avenue (Big John's Market, McConnell Chevrolet), and thence a mostly vacant property south of the former Foss

Creek Elementary School. Properties west of the railroad track are either vacant or used for light industrial purposes.

At the north end of the project, the pathway alignment may cross the north tip of a vacant property to directly join with the intersection of Grove Street and Healdsburg Avenue. A traffic signal exists at this intersection. This property is devoid of significant vegetation.

- North Healdsburg Reach

After crossing Gove Street, the pathway alignment shifts to the west side of the railroad. Pathway users would be directed to cross the street at the existing pedestrian crossing at Grove Street and Healdsburg Avenue. The land uses adjacent to the pathway include the railroad to the east and a mix of residential uses and an agricultural processing use (Simi Winery) to the west. The pathway would run along the rear property line of the residential lots that face a private road, which lies further west and provides access to the Simi Winery. The winery's production facility lies adjacent to the west side of the railroad right-of-way. It also has a tasting room on the east side of the right-of-way that lies next to Healdsburg Avenue. There is an existing pedestrian railroad crossing that connects the winery's production facility and its tasting room. The pathway would run within the west side of the right-of-way as it passes through the winery facility. It would then leave the right of way, just north of the Simi Winery facility, to enter an existing utility road that climbs northward up a slope above the track. At this point the pathway would cross a drainage ravine and enter a large vacant lot known as the RJW property. The pathway would descend a short distance as it enters this property and then continue to an existing railroad crossing located on the west side of Healdsburg Avenue, near Passalacqua Road.

Foss Creek continues to meander on the west side of the railroad track north of Grove Street for about 1,000 feet until it turns east and crosses under the track and leaves the pathway alignment. The pathway alignment lies between the creek and the railroad right-of-way up to this point. At one location the creek comes close to the railroad, leaving about 10-feet for the pathway outside of the railroad 15-foot setback. The predominant vegetation in this area is oak woodland. There are some isolated eucalyptus trees growing in this area as well. The pathway must bridge the creek where it turns east and leaves the pathway alignment. The pathway would also bridge an unnamed ravine that drains run off from US 101. This ravine appears to have been created at the time the freeway was built. It is vegetated by oak woodland. There is no significant vegetation within the pathway alignment as it passes through the Simi Winery facility and the RJW property.

Required Permits and Approvals

The project will require encroachment permits, easements and site license agreements from the North Coast Railroad Authority (NCRA) for use of railroad right-of-way north of Mill Street, and from the Sonoma Marin Area Rail Transit (SMART) for the use of railroad right-of-way south of Mill Street.

It is possible that proposed bridges crossing Norton Slough and Foss Creek could require a Streambed Alteration Agreement from the California Fish and Game Department, depending upon bridge design and whether work to construct the bridges would be required within the creek banks.

It is also possible that the proposed project may require a permit from the U. S. Army Corps of Engineers (Corps) in the event that work must be conducted within the bed and bank of Foss Creek and Norton Slough for the pathway bridge crossings. Both Foss Creek and Norton Slough are perennial streams that qualify as "waters of the United States". The Corps has jurisdiction over the ordinary high water mark of waters of the U. S. A permit from the Corps is required before any work can be conducted within the ordinary high water mark of the creek. The proposed pathway alignment also encroaches on existing drainage ditches that may qualify as seasonal wetlands federally protected under Section 404 of the Clean Water Act. These include a drainage ditch along the west side of the railroad track just north of the proposed Norton Slough crossing, which is densely covered with blackberries due to lack of maintenance. However, it is likely that this project will qualify under the Corps' Nationwide Permit Program since any jurisdictional wetland loss will involve considerably less than one acre and because the project will have minimal adverse affect to any waters of the U.S.

Permits issued by the Corps are not valid until a water quality certification is also acquired from the Regional Water Quality Control Board. The City of Healdsburg (as project applicant) will need to apply to the Board for a 401 water quality certification as part of the permit authorization from the Corps.

Environmental Factors Potentially Affected

As indicated by the checklist on the following pages, the following environmental factors would be potentially affected by this project, involving at least one impact that is a "potentially-significant impact":

Air Quality
Biological Resources
Cultural Resources
Geology and Soils
Hydrology / Water Quality
Noise
Utilities / Service Systems

Environmental Determination

On the basis of the attached Initial Study, I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent, and MITIGATED NEGATIVE DECLARATION will be prepared.

Robert Jones, AICP July 11, 2006
for the City of Healdsburg

Environmental Checklist

I. AESTHETICS

***Impact Significance Criteria*:** A significant impact would occur if a project results in a substantial reduction of visual quality, or if it results in the creation of substantial light or glare adversely affecting views in the area.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Result in visually obtrusive development on designated scenic ridgelines, as delineated in the General Plan, or otherwise have a substantial effect on a scenic vista?	☐	☐	☐	☒	1
b) Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within the viewshed of a designated scenic highway?	☐	☐	☒	☐	1
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐	
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☒	☐	

Discussion of Impacts

a) The proposed pathway alignment does not include any areas within 200 feet of any General Plan-designated Scenic Ridgeline, for which a visibility analysis is required by Scenic Resources and Urban Design Policy A-4 of the General Plan. The alignment follows close to the railroad track and Foss Creek for much of its length, and is not located in any hilly areas of the City.

The proposed project would not have an adverse effect on a scenic vista. Instead, it would provide new opportunities for pedestrians and cyclists to view scenic vistas of Foss Creek.

b) The proposed pathway would not be within the viewshed of either Highway 101 or Healdsburg Avenue, both of which are designated as scenic roadways in the General Plan, with two exceptions. These two exceptions include 1) where the pathway would cross the Healdsburg Avenue/Mill Street/Vine Street/railroad intersection, and 2) at the north terminus of the project where it ends at the intersection of Chiquita Road and Healdsburg Avenue. Regardless of visibility at these two locations, however, this pathway would not damage scenic resources. The project is being planned to limit the need to remove existing trees, and will include new landscaping and trees to compensate for those that must be removed. The project is also intended to provide and enhance public access to viewing riparian habitat and scenic resources along Foss Creek. No rock outcroppings or historic buildings would need to be removed to construct the project.

c) See response to I.b., above. As noted above, the project would include replacement of trees that would need to be removed for construction, and would include new trees and landscaping that would enhance the visual character and quality of areas surrounding the path.

d) Lighting provided along the pathway will be limited to 175-watt fixtures with refractive lenses. While the pathway alignment is adjacent to or near two properties that will be developed for high density housing (i.e., 20 W. Grant Street, and Grant Street Village), the light fixtures will not result in substantial light and glare.

II. AGRICULTURE RESOURCES

Impact Significance Criteria: A significant impact would occur if a project results in conversion of Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, to non-agricultural land, or conflict with existing zoning for agricultural use, or a Williamson Act contract.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒	2, 3
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒	5
c) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☒	

Discussion of Impacts

a) None of the area that would be impacted by the project consists of any land that is considered Prime Farmland, Unique Farmland or Farmland of Statewide Importance.

b) None of the area that would be impacted by the project is zoned for agricultural use or under a Williamson Act contract.

c) See II.a. above.

III. AIR QUALITY

Impact Significance Criteria: A significant impact would occur if the project would a) conflict with or obstruct implementation of any applicable air quality plan, b) violate any air quality standard or contribute substantially to an existing or projected air quality violation, c) result in a cumulative considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors), d) expose sensitive receptors to substantial pollutant concentrations, or e) create objectionable odors affecting a substantial number of people.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☒	☐	☐	6, 7
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐	7
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐	7
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐	
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒	

Discussion of Impacts

a) Pursuant to federal Clean Air Act requirements, all areas of California have been classified by attainment status with regard to National Ambient Air Quality standards. Northern Sonoma County is currently designated by the federal EPA as an attainment area for all federal standards. With regard to State Ambient Air Quality Standards, northern Sonoma County is designated by the California Air Resources Board (ARB) as a non-attainment area for both ozone and PM10 (fine particulate matter less than 10 microns in size). The local air district is considered by the ARB as a downwind ozone receptor subject to “overwhelming transport” from the San Francisco Bay Area. Therefore, the local air district has no separate ozone attainment plan, instead relying on the state ozone attainment plan.

Both ozone and PM10 are generated by vehicular traffic. The project could generate some traffic from path users that come from outside the city or who choose not to walk or bike to the path from residences within the city. However, this traffic generation would not be substantial, and would be offset by the reduction of traffic by persons choosing to bike or walk in place of using vehicles to travel to and from destinations connected by the path. To the extent it would be used as a non-motorized transportation facility in place of vehicular traffic, the proposed project would benefit air quality.

The project has the potential to temporarily create emissions associated with construction activities. Construction-related dust due to grading of the site could contribute to the level of particulate pollution, depending upon factors such as wind velocity, timing of construction and soil moisture levels. Downwind concentration of construction-related dust could also be a nuisance to the nearest sensitive receptors such as any nearby housing areas. Construction-related vehicles would contribute minor amounts of ozone precursors (i.e., reactive organic gases and nitrogen oxides) as a result of vehicular engine exhaust, but would not result in a cumulative considerable net increase in such pollutants because of the limited size of the project and the temporary nature of construction.

b) See response to 3.a., above.

c) See response to 3.a., above.

d) See response to 3.a., above.

e) The project does not involve the creation of any new source of air emissions that would create objectionable odors.

Mitigation Measures

In order to minimize the release of emissions of pollutants for which the local air district is considered non-attainment and/or for which there is an applicable attainment plan, and to reduce potential construction-related impacts involving ozone precursors (i.e., reactive organic gases and nitrogen oxides), and fine particulate matter (PM10), to less than significant, the following mitigation measures shall be incorporated as part of the project:

<u>Mitigation Measure 1</u>

Construction equipment shall be maintained and operated to minimize exhaust emissions. During construction, trucks and equipment shall be operated only when necessary. Equipment shall be kept in good condition and well tuned to minimize exhaust emissions.

Timing/Implementation: Specifications to be included in improvements plans and construction activities shall be monitored

Enforcement/Monitoring: City of Healdsburg Building and Public Works Departments

<u>Mitigation Measure 2</u>

Contactor shall provide dust control measures at all time, including weekends and holidays, during all phases of construction to the satisfaction of the City Engineer. Dust control measures shall include, but not be limited to, watering, application of dust suppressants or other means in order to prevent fugitive dust from the leaving the project site. Paved areas at the access points shall be swept or washed as often as necessary each day to eliminate tracing soil and debris tracking onto public streets. Any soil and/or debris, rock, gravel, etc. resulting on any public streets as a result of this project shall be removed immediately. Paved areas within the right-of-way shall be left in a cleaned and washed condition at the end of each work day.

Timing/Implementation: Specifications to be included in improvements plans and construction activities shall be monitored

Enforcement/Monitoring: City of Healdsburg Public Works Department

IV. BIOLOGICAL RESOURCES

Impact Significance Criteria: Impacts upon biological resources would be significant if the proposed project substantially affected a rare or endangered plant or animal species (as defined and determined by the State Department of Fish and Game), the U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers, or the habitat of the species. Wetland losses can be considered significant depending upon significance or quality of habitat, presence of vernal pool features, and acreage. A substantial loss of riparian vegetation or habitat acreage or value resulting from development would be a significant impact. A substantial loss of acreage of other types of habitat identified as biologically unique and of limited distribution on a regional basis (e.g., serpentine chaparral, serpentine grassland, native grassland) may also be a significant impact.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐	15 - 21
b) Have a substantial adverse effect on any riparian habitat or result in a substantial loss of any other types of habitat identified as biologically unique and of limited distribution, such as serpentine chaparral, serpentine grassland, and native grassland?	☐	☒	☐	☐	15 - 19
c) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption or other means?	☐	☐	☒	☐	12
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐	15 - 21
e) Result in any loss of heritage trees (as defined in the City Zoning Ordinance), or any substantial loss of oak woodland and/or mixed evergreen forest??	☐	☒	☐	☐	5

Discussion of Impacts

a) The proposed pathway alignment includes two areas of biologically-sensitive habitat. These include the area where the pathway would cross Norton Slough, and sections where it would both parallel and cross over Foss Creek just east of the Grove Street Detention Basin and south of Simi Winery.

Otherwise, the project alignment is sited in highly-disturbed or developed environments such as along the existing railroad tracks and Grove Street, in which there does not exist suitable habitat for any locally known occurrences of special status plants or animals.

Riparian habitat loss would occur with construction of the pathway and associated bridges across Norton Slough and Foss Creek. It is estimated that the total loss of riparian habitat at these locations resulting from project implementation will be approximately 0.17 acre. Mitigation for this impact is shown below.

Based on numerous biological assessments for projects involving Foss Creek and Norton Slough in the vicinity of the proposed pathway alignment (see list of references at end of this Initial Study), the riparian woodland habitat along Foss Creek and Norton Slough does not provide habitat for any known special status plants. The understory and ground cover is dominated by dense blackberry thickets, non-native periwinkle, and non-native annuals and forbs. Therefore, construction of the project will not affect any special status plant species, including those which are federally- or state-listed.

The project does have the potential to affect two species of special-status animals based on the most recent biological assessment of a project affecting Foss Creek (Valerius, April 7, 2003). A recent survey conducted by a fisheries and wildlife biologist for a biological report prepared for the for the Grant Street / Foss Creek Culvert Crossing Extension Project indicated that Foss Creek provides habitat for two special-status animal species: steelhead trout, a federally-listed threatened species, and northwestern pond turtle, a California species of special concern. While a California Department of Fish and Game biologist stated a concern that California freshwater shrimp could also be present in Foss Creek during a field review for the Grant Street bridge project, a subsequent field survey did not find this species present.

It is anticipated that any bridge associated with the pathway will be a clear span structure, rather than using a culvert, and that the bridge abutments will be sited outside the normal high water mark of the waterway and outside the limits of any jurisdictional wetland.

The project could also affect nesting raptors, loggerhead shrikes and other special-status birds due to removal of trees used for nesting, or in the event that construction causes disturbance to these species.

b) As noted under item 4.a, above, riparian habitat loss would occur with construction of the pathway and associated bridges across Norton Slough and both along and across Foss Creek. (See the Environmental Setting section of this Initial Study for a description of the riparian vegetation in these two areas).

The loss of riparian habitat was calculated for this project by multiplying the proposed width of the pavement and graveled shoulders (16 feet) of the pathway by the length of the alignment through areas of riparian woodland canopy as shown on aerial photos (see Pathway Plan Appendix C, Pathway Alignment Details). Additional acreage could be temporarily affected by construction due to grading to establish the pathway, but such areas would likely naturally revegetate with riparian woody vegetation within a few years of project completion, unless mowed or kept clear by maintenance activities, as evidenced by the regrowth of riparian woody vegetation on the sides and tops of the embankment constructed for the Grove Street detention basin.

It is estimated that the loss of riparian woodland habitat in the area of the Norton Slough bridge crossing will involve approximately 2,160 square feet, or about 0.05 acre. It is estimated that the loss of riparian woodland habitat in the vicinity of the Grove Street detention basin where the pathway would both parallel and cross Foss Creek will involve approximately 5,210 square feet, or about 0.12 acre. This includes the section of the top of embankment enclosing the east side of the Grove Street detention basin where rock rip rap is used for protecting the outlet weir for overflow from the detention basin into Foss Creek during very high flood events, and where riparian vegetation, primarily willow and blackberry) has colonized this section of the embankment. Finally, the estimated riparian woodland habitat loss south of Simi Winery due to the parallel pathway next to the creek and a bridge will involve approximately ____ square feet, or about 0.12 acre.

Otherwise, the rest of the embankment top, where the pathway alignment is sited, is kept mowed or otherwise maintained to prevent woody vegetation encroachment.

The total loss of riparian habitat at both locations resulting from project implementation would be approximately 0.17 acre.

Some additional minor areas of riparian vegetation (i.e., willows, Oregon ash, valley and live oaks, blackberries) will be impacted where it has colonized ditches along the railroad right-of-way, and where the pathway will either cross or encroach on these existing drainage ditches. The largest such area is situated near Front Street where the City plans on constructing a culvert to improve drainage where flooding currently occurs. Woody vegetation in this area consists of blackberries and young live oaks.

In the event that work to construct the bridge crossings at Norton Slough and Foss Creek will be conducted within the beds and banks of these two waterways, the project will require a Streambed Alteration Agreement from the California Department of Fish and Game under Section 1601 of the California Fish and Game Code.

Other than riparian habitat, the project site does not include any other types of habitat identified as biologically-unique and of limited distribution, such as serpentine chaparral, serpentine grassland or native grassland.

The riparian setback required by City of Healdsburg Zoning Ordinance Section 18120 (a) is not applicable to the project since facilities such as public streets and utilities are exempt from these requirements, and the proposed pathway will function as a type of public street that is intended to serve non-motorized transportation.

c) It is possible that the proposed project will require that work be conducted within the bed and bank of Foss Creek and Norton Slough for pathway bridge crossings. Both Foss Creek and Norton Slough are perennial streams that qualify as “waters of the United States.” The U. S. Army Corps of Engineers (Corps) has jurisdiction over the ordinary high water mark of waters of the U. S. A permit from the Corps will be required before any work can be conducted within the ordinary high water mark of the creek. The proposed pathway alignment also encroaches on existing drainage ditches that may qualify as seasonal wetlands federally protected under Section 404 of the Clean Water Act. These include a drainage ditch along the west side of the railroad track just north of the proposed Norton Slough crossing, which is densely covered with blackberries due to a lack of maintenance. However, it is likely that this project will qualify under the Corps’ Nationwide Permit Program since it would involve considerably less than one acre and because it will have minimal adverse affect to any waters of the U.S. Therefore, no mitigation is needed since the project will not have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the Clean Water Act.

d) See response to item 4.a., above.

e) Under the City’s Zoning Ordinance, heritage trees are defined as any tree with a diameter of 30 inches, measured two feet above ground level. A tree survey and evaluation have not yet been conducted for the entire proposed pathway alignment. However, a preliminary review indicates that there are three large oak trees located on the embankment on the east side of the Seghesio Winery wastewater treatment pond, close to the proposed pathway alignment, that could qualify as heritage trees. The pathway will not require the removal of these trees, but will likely require a retaining wall and some fill slope, possibly within the drip line of these three trees.

A number of small- to medium-sized native trees, including valley and live oak, walnut, willow and Oregon ash have colonized margins of the railroad track in recent years due to lack of maintenance, although much of the alignment north of Dry Creek Road has been recently cleared to construct The Geysers pipeline project. Some of these trees will need to be removed to construct the pathway. Mitigation Measure #5 requires the replacement of trees in the areas of riparian woodland that will be removed for the project at a ratio of 3:1.

As described in the Environmental Setting section of this initial study, the project site does not contain any substantial acreage of oak woodland or any mixed evergreen forest.

Mitigation Measures

In order to ensure that potential impacts to special-status animal species will be reduced to a less-than-significant level, and as recommended by the biological report prepared for the Grant Street bridge project, the following mitigation measure shall be incorporated into the project:

Mitigation Measure #3

Design the bridge crossings to avoid encroachment of abutment and piers, and the need to divert water during construction, within the banks of Foss Creek and Norton Slough. Furthermore, schedule construction during the time of year when there is the least amount of water in either waterway (e.g., August, September). In the event that construction impacts to the aquatic habitat of either creek cannot be avoided, conduct a pre-construction survey of the site to determine the possible presence of steelhead trout and northwestern pond turtle at locations where bridge crossings are proposed. If any steelhead trout or northwestern pond turtle are found at these locations, consult with the California Department of Fish and Game for guidance. Measures for avoiding impacts to these species during construction of bridges would be similar to those required for the Grant Street bridge project.

Timing/Implementation: Prior to approval of improvement plans

Enforcement/Monitoring: City of Healdsburg Planning and Building Department

Mitigation Measure #4

Conduct a pre-construction survey of the site to determine the presence of trees used for nesting raptors, loggerhead shrikes and other special-status birds. If any special-status birds are nesting in trees that will either be removed or located in close vicinity to the area affected by construction, delay construction in the area where the nests are located until the young have fledged.

Timing/Implementation: Prior to construction.

Enforcement/Monitoring: City of Healdsburg Planning and Building Department

Mitigation Measure #5

For the proposed pathway in the vicinity of the Norton Slough bridge crossing, along Foss Creek in the vicinity of the Grove Street detention basin and south of Simi Winery, a qualified arborist or a biologist shall conduct a survey to determine the number of native riparian trees species that would need to be removed to construct the project. Replace these removed trees by planting at a ratio of 3:1 mitigation to loss, using the same species as those that are removed. Plant materials shall, to the extent that materials are available, be collected from the project site. If sufficient plant material is not available for collection, then plant material shall be obtained from a certified native nursery and the plants should be from a site with similar conditions to ensure survival. The new trees shall be located along sections of either Foss Creek or Norton Slough that have insufficient riparian vegetation, and/or have problems with erosion. The new plantings shall extend the area of riparian woodland to provide at least 0.14 acre so that no net loss of riparian habitat occurs. Potential project impacts involving construction-related increases in erosion and sedimentation shall be mitigated through implementation of Mitigation Measure 8.

Prior to construction, the City shall consult with the California Department of Fish and Game (DFG) to determine if a Streambed Alteration Agreement may also be required for these bridge crossings. DFG may place restrictions or conditions on the alteration of streambed or bank and on the removal of riparian trees and shrubs.

Timing/Implementation: Prior to approval of improvement plans for roads and road crossings of drainages, and following completion of construction as required under mitigation plans. Monitoring and replacement of any replacement trees that do not survive shall be conducted for a period of not less than three years.

Enforcement/Monitoring: City of Healdsburg Planning Department

In order to protect any heritage trees, and to compensate for loss of, or significant adverse impacts to trees within or close to areas affected by grading or pathway construction, the following measure shall be incorporated into the project:

Mitigation Measure #6

A qualified arborist shall work with project planners and engineers during each stage of design to maximize the preservation of native trees. To the extent possible, the pathway alignment shall be modified to minimize the loss of trees.

Trees shall be protected from construction by fencing the root zone, defined as 1.5 times the radius between the trunk and drip line and keeping all grading and construction activity outside of this zone. Specific tree protection measures shall be determined by a qualified arborist, with periodic monitoring to ensure that such measures are being implemented properly and in accordance with the mitigation requirements. The following tree protection measures are typically recommended for all trees to be retained:

- If pruning for clearance is required on any trees to remain, it should be done by trained, qualified tree workers according to ISA and ANSI Pruning Guidelines prior to construction. Pruning should be the minimum needed for hazard reduction (i.e., the removal of deadwood 2" and larger, etc.) and clearance.
- Plastic tree protection fencing should be installed at the driplines of trees within the zone of construction activity, (or the outer edge of the dripline or groups of trees). If access within the dripline will be required, fence to be placed at expected limit of grading. Fence should be installed prior to the start of clearing and grading operations, and kept in place throughout construction activities.
- If any roots larger than 1" are encountered during construction activities, they should be cut cleanly across the face of the root with a sharp saw, past any damaged portions.
- No parking, operation of equipment, storage of materials, disposal of wastes or other construction activity shall occur within driplines of protected trees.

Timing/Implementation: Specifications to be included in the grading and improvement plans. Monitoring shall occur during project construction.

Monitioring/Enforcement: City of Healdsburg Public Works Department

V. CULTURAL RESOURCES

Impact Significance Criteria: A significant impact would occur if a project would adversely affect the significance of a historical or archaeological resource (defined by CEQA Guidelines Sec. 15064.5), destroy a unique paleontological resource, or disturb any human remains.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☒	☐	☐	
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☒	☐	☐	
c) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☐	☐	☒	
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐	

Discussion of Impacts

a) <u>Railroad Station Reach</u>

Identified historic resources that are located adjacent to this reach include two railroad depot buildings and a house at 329 Harmon and built in 1880. These properties are eligible for the National Register of Historic Places (Par Environmental Services, Inc., 2001). However, the pathway would not affect any of these resources.

<u>Foss Creek South Reach</u>

Cultural resource evaluations have been conducted for two segments of this reach. An Initial Study prepared for the property at 20 W. Grant Street, which has approximately 800 feet of frontage on the pathway, did not identify any potentially-significant cultural resources.

A cultural resources evaluation conducted for approximately 1,650 linear feet of this reach as part of the Mitigated Negative Declaration for the Foss Creek Detention Basin project did not identify any significant cultural resources in this area and no sub-surface resources were reported to have been discovered during construction of the basin.

The former Miller Packing House (55 West Grant Street), is a large, single-gable industrial building constructed of corrugated metal in 1913 on the north side of W. Grant Street west of the railroad track. It was used for packing prunes, an important agricultural commodity in the region from 1925 to 1970. It was also used for packing apples and pears, and for dehydrating vegetables during World War II. This building is listed in the Historic Resources Inventory published by the California Department of Parks and Recreation, Office of Historic Preservation as a historic resource eligible for listing in the California Register. The building appears to have been modified with a number of additions since its original construction that encroach into the railroad right-of-way. Since several additions may need to be removed to accommodate construction of the pathway, an evaluation is needed to ensure that the historic integrity of the original structure is not adversely affected.

<u>Foss Creek North Reach</u>

A number of historic telegraph poles are located along this reach within the railroad right-of-way. As part of The Geysers pipeline project, the poles were removed and reinstalled after the completion of work. If poles are found to be located within the pathway alignment, a similar approach could be used.

<u>North Healdsburg</u>

No cultural resource evaluations have been conducted for this reach.

b) See response to item 5.a., above.

c) See response to item 5.a., above.

d) See response to item 5.a., above.

Mitigation Measures

To avoid any potentially significant to possible buried cultural resources, the following mitigation measures will be incorporated into the project:

<u>Mitigation Measure #7</u>

The City shall ensure that construction documents require the construction contractor to stop work if cultural resources or archaeological sites are accidentally discovered during construction. In this event, Section 15064.5 (f) of the State CEQA Guidelines shall be followed if archaeological sites are accidentally found during construction. If any human remains are accidentally discovered, Section 15064.5 (d) of the State CEQA Guidelines shall be followed.

Timing/Implementation: Specifications to be included in improvements plans.

Enforcement/Monitoring: City of Healdsburg Planning Department

Mitigation Measure #8

Cultural resource evaluations shall be conducted for the pathway segments 1) between West Grant Street and the south end of the detention basin, 2) between the north end of the detention basin and Dry Creek Road and 3) north of Grove Street at Healdsburg Avenue if the Class I pathway design is selected for the North Healdsburg reach.

Timing/Implementation: To be completed prior to approval of the improvement plans for the affected reach

Enforcement/Monitoring: City of Healdsburg Planning Department

Mitigation Measure #9

An evaluation of the structures at 55 W. Grant Street shall be prepared by a qualified historian to determine potential historic resource impacts related to pathway improvements and to recommend measures needed to avoid such impacts.

Timing/Implementation: To be completed prior to approval of the improvement plans for the affected reach

Enforcement/Monitoring: City of Healdsburg Planning Department

VI. GEOLOGY AND SOILS

Impact Significance Criteria: A significant geologic impact would occur if a project exposes people or structures to major geologic hazards such as seismic damage, slope and/or foundation instability, erosion or sedimentation, land subsidence, and/or other problems of a geologic nature as set forth in the City of Healdsburg General Plan. A significant impact would also occur if a project results in substantial increases in erosion and sedimentation rates.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Expose people or structures to potentially substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault?	☐	☐	☐	☒	2
ii) Strong seismic ground shaking?	☐	☐	☒	☐	2
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐	2
iv) Landslides?	☐	☐	☐	☒	1
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐	
c) Be located on expansive soil, creating substantial risks to life or property?	☐	☐	☒	☐	

Discussion of Impacts

a.i) The closest known potentially active fault is the Healdsburg Fault, lying a considerable distance to the east/northeast of the project site. Since there are no potentially-active faults within or near the project site, the potential for ground rupture beneath the proposed pathway is considered nil.

a.ii) While persons using the proposed pathway for walking and cycling would be subject to strong seismic ground shaking in the event of a major earthquake, this risk would be no different than existing on city streets and sidewalks in the same area.

a.iii) The project site includes sections adjacent to Foss Creek that are located in Ground Failure Zone 3, defined in Figure IX-3 of the General Plan as "Areas of highest potential for liquefaction, lurching and lateral spreading. Lurching and lateral spreading is highest adjacent to stream channels where free face conditions exist." The remainder of the alignment is located in Zone 2, defined as "Areas of moderate potential for liquefaction, lurching and lateral spreading." The entire project site is located in Ground Failure Zone 4, which is defined as "Areas with higher potential for ground shaking and settlement."

The design and specifications for constructing the pathway pavement will account for soils at the site and any other potential ground failure risk factors such as liquefaction, lurching, lateral spreading, ground shaking and settlement. Therefore, the project will not expose people or structures to potentially substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure.

a.iv.) None of the project site is located within Slope Hazard Zone 3, which is defined in Figure II-4 of the General Plan Policy Document as having the "Highest Potential for Slope Instability." Instead, the proposed pathway alignment is located in Zone 1, with the lowest potential of slope instability. The alignment is situated in relatively level terrain that is not subject to risk of landsliding.

b) Some grading will be needed to construct the pathway just east of the Seghesio Winery wastewater treatment pond and just south of the detention basin since this section of the alignment traverses an embankment, necessitating a retaining wall to the west of the pathway along this section. Otherwise, minimal grading will be needed to construct the pathway on the alignment as proposed, since the terrain is relatively level. Removal of vegetation to construct the pathway would also expose soil, but the only areas that would remain exposed to soil erosion would be outside the paved path and graveled shoulders. Limited areas outside te paved pathway and shoulders may be exposed where needed to construct cut or fill slopes. Both vegetation removal and exposure of soil due to grading could lead to erosion and loss of topsoil, affecting water quality of nearby waterways, such as Foss Creek.

c) It is possible that portions of the project alignment could include areas of expansive soil. The design and specifications for use in constructing the pathway pavement will account for any such expansive soils found at the site. In any case, since the project does not involve any habitable structures and instead involves a paved pathway that can be repaired if damaged by expansive soil, it would not create a substantial risk to life or property.

Mitigation Measure

To ensure that this potential impact involving soil erosion and water quality degradation is minimized, the following mitigation measure shall be incorporated into the project:

<u>Mitigation Measure #10</u>

Implement an erosion control plan for all phases of the project in which earth will be exposed. This plan shall include both short-term measures, such as hydroseeding and/or straw mulching, and long-term measures, such as landscaping and native habitat restoration, to ensure no loss of topsoil and flow of sediment into Foss Creek or other waterways.

Timing/Implementation: Specifications to be included in the construction plans, with implementation prior to the beginning of the rainy season (end of October).

Enforcement/Monitoring: City of Healdsburg Public Works Department p

VII. HAZARDS AND HAZARDOUS MATERIALS **Impact Significance Criteria:** A significant impact would occur if the proposed project creates a potential health or safety hazard, or involves the use, production, or disposal of materials that pose a hazard to people or animal or plant populations in the project area, or interferes with emergency response plans or emergency evacuation plans.					
Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	☐	☐	☐	☒	
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒	
d) Be located on a site which is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒	
e) Be located within two miles of the Healdsburg Municipal Airport and result in any safety hazard or noise problem for persons using the airport or for persons residing or working in the project area?	☐	☐	☐	☒	
f) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒	
g) Be located in an area designated as having a high, extreme or severe fire hazard, or otherwise expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐	1

Discussion of Impacts

a) The project will not involve any transport, use, or disposal of any hazardous materials.

b) See response to item 7.a., above.

c) See response to item 7.a., above.

d) Most of the proposed pathway is situated along the railroad tracks in which previous maintenance has included the use of herbicides to maintain the track from encroaching vegetation. However, none of the pathway alignment proposed to utilize the railroad right-of-way is known to be located on any known or listed hazardous material sites. A Limited Level 1 Initial Site Assessment (ISA) for hazardous waste/materials was conducted for the Healdsburg Train Depot Park and Ride Project. The area assessed included the first section of the proposed pathway between Front Street and Healdsburg Avenue, in the vicinity of the currently unused Healdsburg Train Depot. The only area of contamination found was the turntable, located approximately 660 southeast of the depot on the other side of the tracks from the proposed pathway alignment. This site has been subsequently remediated (Par Environmental Services, Inc., March 2001).

The section of the proposed pathway north of Norton Slough through the eastern edge of city-owned property at 20 West Grant Street was also assessed for hazardous waste/materials for a project previously proposed for this site (*Initial Study for Alzheimer's and Elder Care Facilities, 20 West Grant Street*, Earthcraft Planning Services, December 1998.)

The section of the pathway through City-owned property used for the Grove Street detention basin will utilize an embankment and areas that were used to construct the detention basin in the early 1980's; no known hazardous material/waste sites are known to exist in this area.

e) None of the project site is located within two miles of the Healdsburg Municipal Airport.

f) Project implementation would not involve any closure of roads and therefore would not impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan.

g) According to Figure II-5 (Wildland Fire Hazard) in the City General Plan Policy Document, none of the site or adjacent properties is located within any zone designated having a high, extreme or severe fire hazard. The only area of native woodland that is included within the project site is a riparian woodland in the vicinity of the City's Grove Street Detention Basin. This type of woodland is not as subject to wildland fire as oak woodlands or chaparral areas that comprise areas designated as having a high, extreme or severe fire hazard, such as found in the foothills on the north and east side of Healdsburg. However, in dry summer season, it is possible that a fire outbreak could occur due to human activity in the area. While this project would generate more human activity in this area of riparian woodland, in the event of a fire, fire apparatus would be able to use the 12-foot wide paved pathway to provide better fire response and access to this area than currently exists.

VIII. HYDROLOGY AND WATER QUALITY

Impact Significance Criteria: A significant impact would occur where a project results in an increased exposure of persons or property to substantial flooding or erosion, or would result in adverse effects to surface or groundwater quality or quantity.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Violate any water quality standards, waste discharge requirements, or otherwise substantially degrade water quality?	☐	☒	☐	☐	
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such as there would be a net deficit in aquifer volume or a lowering of the local groundwater table?	☐	☐	☐	☒	

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or offsite?	☐	☐	☒	☐	
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff, in a manner that would result in flooding on- or offsite?	☐	☐	☒	☐	
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐	
f) Place housing within a 100-year flood as mapped on a federal Flood Hazard Boundary, or otherwise expose people or structures to a significant risk of loss, injury or death involving flooding?	☐	☐	☐	☒	2

Discussion of Impacts

a) Site grading for this project could result in erosion-related impacts to water quality. However, implementation of Mitigation Measure #8 under item 6.d., above, will ensure such impacts will be adequately mitigated to less than significant.

b) The project does not involve any pumping of groundwater, and will not interfere with groundwater recharge or movement in the project site vicinity.

c) The project will not substantially alter the existing drainage pattern of the area. Furthermore, implementation of Mitigation Measure #8 under item 6.d., above, will avoid substantial erosion or siltation on- or off-site.

d) As noted under item 8.c. above, the project will not substantially alter the existing drainage of the site. The project will incrementally increase surface storm runoff due to additional non-permeable surfaces associated with installing a 12-foot wide paved pathway for a distance of approximately 2.49 miles. However, this additional surface runoff is not considered substantial to the degree that it would result in any drainage problems, exceed the capacity of existing or planned storm water drainage systems, or cause in an increase in flooding on- or off-site.

e) See response to item 8.d., above. Runoff from paved surfaces of the bike path will not include grease or residues from motorized vehicles since the path will normally only be used by cyclists and pedestrians, with the exception of infrequent maintenance or emergency response vehicles.

f) The project does not involve any new housing that would be situated within an area subject to the 100-year flood.

IX. LAND USE AND PLANNING					
Impact Significance Criteria: Significant land use impacts would occur if the project would substantially conflict with established uses in the project area, disrupt or divide established land use configurations, or result in a conflict with any applicable land use plan or policy (including but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.					
Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Substantially conflict with established uses in the project area?	☐	☐	☒	☐	
b) Physically divide an established community?	☐	☐	☒	☐	
c) Conflict with any applicable land use plan or policy (including but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒	1, 11

Discussion of Impacts

a) As noted under the Project Description, the project includes design measures intended to avoid conflicts with the future, planned use of the railroad for freight or commuter transport by the Sonoma Marin Area Rail Transit (SMART). The City will be submitting plans for the project to SMART for review and approval to ensure that potential conflicts are minimized to acceptable levels, including any requests for variances to setback requirements.

The project would not conflict with established uses in the project area. All of the land uses adjacent to the proposed pathway alignment are public, industrial or commercial. The proposed pathway would provide a new non-motorized transportation facility that would serve existing adjacent land uses. However, construction of the pathway just north of Grant Street will require the City to remove and possibly replace some storage sheds that have been built in the railroad right-of-way. Also, the pathway will cross the northeast corner of Seghesio Winery. The City would obtain an easement over the affected property. These impacts are minor because they will not adversely affect the use of these properties nor will they hinder operation of the existing business. The project will not require the relocation of housing or businesses, or acquisition of property from any of the adjacent properties. The construction of the project would likely be beneficial to adjacent uses by upgrading the visual aspect of the area and bringing a public presence and police patrol to an area that would make vandalism or other illegal activities less likely.

b) The project would not disrupt or divide established land use configurations. As noted under item 9.c. above, the project would provide a new non-motorized transportation facility that would provide additional access to existing adjacent land uses.

c) The project would not conflict with any applicable land use plan or policy adopted for the purpose of avoiding or mitigating an environmental effect. The project is consistent with and supportive of, goals and policies of the City's General Plan as listed on page 9 and 10 of Working Paper #2 (Existing Conditions).

X. NOISE

Impact Significance Criteria: Noise impacts would be significant if implementation of a non-preempted project exposes residences or other noise-sensitive land uses to noise levels exceeding the standards set forth in Article 21 under Section 9 of the City Zoning Ordinance. Construction noise impacts would be significant if such noise levels exceed limits specified in Section 8 of the above referenced section of the Zoning Ordinance. A cumulative noise impact is considered significant if noise from the project substantially contributes to a condition where a normally acceptable noise level is exceeded.

Would the project result in:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies?	☐	☒	☐	☐	1, 4
b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?	☐	☐	☒	☐	
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐	
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐	

Discussion of Impacts

a) The proposed pathway alignment is located adjacent to the following sensitive noise receptors: the Montessori School on Grove Street just north of the proposed Norton Slough crossing and the Oak Grove apartments on the north end of Grove Street. The pathway alignment is also located on a portion of a property that is owned and planned by the City as an affordable housing site. All of these locations are currently impacted by traffic noise from nearby streets, and would be impacted by noise created by passing of trains if and when train service resumes since the track is located immediately to the east of these sensitive receptor locations. Since cyclists and pedestrians will primarily use the pathway, it would not be a source of traffic noise such associated with a new street or a land use that generates motor vehicle traffic. However, construction of the pathway could generate some short-term noise increases in the area.

b) Project construction, specifically site grading or any rolling for paving operations, could result in vibration. However, this effect will be temporary and localized, and should not expose any person to any excessive ground borne vibration or ground borne noise levels. Since existing or future planned housing areas are located at a sufficient distance from the proposed pathway alignment, it would not be perceptible to any nearby residents.

c) See response to item 10.a., above.

d) See response to item 10.a., above.

Mitigation Measure

To ensure that construction noise impacts are reduced to less than significant, the following mitigation measure shall be incorporated into the project.

Mitigation Measure #11

The following noise-reducing construction practices shall be employed for all improvements:

a. All equipment shall have sound control devices no less effective than those provided on the original equipment. No equipment shall have an unmuffled exhaust.

b. Heavy equipment operation, grading activities and construction of improvements shall be limited to the hours of 7:30 a.m. to 6:00 p.m., Monday through Saturday in order to avoid disturbance to nearby residents during sensitive early morning and evening hours.

c. The contractor shall notify all adjoining residents in advance of clearing, grading and construction activities associated with the project.

Timing/Implementation: Specifications to be included in all improvement plans

Enforcement/Monitoring: City of Healdsburg Planning Department

XII. POPULATION AND HOUSING

Impact Significance Criteria: Direct or indirect significant impacts could occur if the project induces substantial population growth or if substantial numbers of existing housing or people are displaced, necessitating the construction of replacement housing elsewhere.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒	
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒	

Discussion of Impacts

a) The project will not directly induce population growth in Healdsburg since it does not involve either housing or new businesses.

b) The project site does not contain any existing housing, and therefore, the project will not displace any housing.

c) As discussed under item 11.b., above, the project does not involve the displacement of substantial numbers of people.

XII. PUBLIC SERVICES

Impact Significance Criteria: A significant impact would occur if the project results in substantial adverse physical impacts associated with the provision of new or physically altered government facilities, or the need for new or physically altered government facilities (in order to maintain acceptable service ratios, response times or other performance objectives), the construction of which could cause significant environmental impacts. A significant impact could also occur where the project results in an increase in the use of existing parks or other recreational facilities, such that substantial physical deterioration of the facility would occur or be accelerated.

Would the project involve adverse impacts associated with the following public services:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Fire protection?	☐	☐	☒	☐	
b) Police protection?	☐	☐	☒	☐	
c) Schools?	☐	☐	☐	☒	
d) Parks?	☐	☐	☐	☒	
e) Other public facilities?	☐	☐	☐	☒	

Discussion of Impacts

a) Please see response to item 7.g. regarding the project's impact on increasing fire hazards or location in fire hazardous areas. The project will not increase demand for fire protection services since no new housing or businesses are proposed. The project will provide a paved pathway that would be able to be used for emergency vehicles, including fire fighting equipment and apparatus in areas that presently lack such access.

b) The project will not increase demand for police services since it does not involve new housing or employment centers, as noted under item 12.a., above.

Currently, some areas along the railroad track and in the vicinity of the Grove Street Detention Basin are used by homeless persons or migrant workers for illegal camping. In addition, the unused railroad track and right-of-way is also used for pedestrian movement through the area. The proposed pathway will provide increased visibility in these areas, and provide a means of access for police to maintain public safety. Lighting will also be provided along more heavily trafficked segments of the pathway, such as in the downtown area.

c) The project will not increase demand for schools since it does not involve new housing or employment centers, as noted under item 12.a., above.

d) The project will not increase demand for parks since it does not involve new housing or employment centers, as noted under item 12.a., above. Instead, the project will have a beneficial impact on parks since it will provide opportunities for walking and biking, both of which are popular recreational pursuits. The path will also a safe and non-motorized transportation link to several park facilities, including Memorial Beach Park and Railroad Park on the Russian River, the downtown plaza, and a future park in Area C (Saggio Hills project site).

e) The project will not increase demand for other public facilities for the reasons listed under item 12.a., above.

XIII. TRANSPORTATION/TRAFFIC

Impact Significance Criteria: A significant impact would result if operation for any single traffic movement dropped to LOS E or F or if operation of an intersection as a whole fell below LOS D. For short, dead end streets, an increase in volumes of 500 vehicles per day would be considered significant. For longer streets, an increase in traffic volumes above 2,000 vehicles per day would be considered significant. A significant impact would also occur if there is inadequate emergency access or inadequate parking capacity.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐	
b) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible equipment (e.g., farm equipment)?	☐	☐	☒	☐	
c) Result in inadequate emergency access?	☐	☐	☐	☒	
d) Result in inadequate parking capacity?	☐	☐	☒	☐	

Discussion of Impacts

a) Implementation of the project could lower traffic volumes on Healdsburg Avenue and local streets to the extent persons use the path by walking or biking instead of travel by motor vehicle to get to and from destinations that the path would link. Offsetting some of this traffic reduction, implementation of the project could attract some traffic by out of town visitors desiring to use the path. However, visitor-related traffic generation would not be substantial, and such out of town visitors are likely to drive to Healdsburg for other reasons as well, such as to browse local shops or visit local wineries. Therefore, traffic impacts would remain less than significant.

b) At the proposed uncontrolled crossings of Matheson Street and North Street, crossings will occur at existing pedestrian crossings on the east side of Vine Street at intersections that are four-way stop sign controlled.

For roads with higher traffic volumes, mid-block crossings will utilize the Signalized Controlled Pedestrian Flasher type that would allow cyclists and pedestrians desiring to cross the roadway to activate a signal stopping vehicular traffic by using a push bottom.

Where the proposed pathway alignment require rail crossings, these two locations will utilize existing roadway/pedestrian grade crossings that will have operational crossing arms and signals if and when trains resume service through Healdsburg.

With these existing or proposed traffic controls, the project will not result in any dangerous conditions for pedestrians or cyclists at any of the proposed roadway or railroad crossings.

c) The project will create a means of access for emergency vehicles in areas where there presently is none. The pathway will be wide enough to permit the passage of emergency vehicles. Bollards will be used to keep non-authorized motor vehicles from entering the pathway where it crosses public streets.

d) The project will not require removal of any existing parking. Parking for those arriving by vehicle to use the pathway will be available on-street along Front Street at the south end of the project, at the proposed park-and-ride lot at the railroad depot, and at the West Plaza parking lot. A park-and-ride lot is also available at the south end of Healdsburg Avenue, connected to the south end of the pathway at Front Street by Class II bike lanes on Healdsburg Avenue and a Class III signed route on Front Street. This is considered adequate for the project since many users will originate from homes in neighborhoods in Healdsburg rather than drive to the path and thus require parking.

XIV. UTILITIES AND SERVICE SYSTEMS

Impact Significance Criteria: A significant impact would occur where utilities (i.e., water supply, fire flow, sewer capacity, electricity) are inadequate or unavailable to serve the proposed project unless needed improvements are implemented prior to or in conjunction with the project.

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less than Significant Impact	No Impact	Reference(s)
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒	
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒	
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☒	☐	☐	
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒	
e) Result in inadequate wastewater treatment capacity to serve the project's projected demand in addition to existing commitments?	☐	☐	☐	☒	
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☒	☐	☐	
g) Comply with federal, state and local statutes and regulations related to solid waste?	☐	☐	☐	☒	

Discussion of Impacts

a) The project will not generate any wastewater.

b) See response to 14.a, above.

c) As noted under the Project Description, an existing inadequate drainage ditch will be converted to a culvert below the pathway just north of Front Street. New culverts will be needed where the pathway will cross existing drainage ditches along the railroad right-of-way, and in some areas, the ditches may need to be realigned. These improvements are considered minor and would not cause significant environmental effects. The project could impair the function of the Grove Street Detention Basin if improperly designed and constructed. This facility is owned and used by the City of Healdsburg to control and reduce flooding along Foss Creek downstream of the basin, including the downtown area. The proposed pathway follows an alignment that utilizes the eastern embankment enclosing the west side of the basin, separating it from Foss Creek to the east. Construction of the pathway could potentially result in a modification to the present height of this embankment, affecting either the inlet or outlet to and from Foss Creek and thereby affect the intended function of the basin. The project would also convert the top of the embankment enclosing the western side of the detention basin to a paved pathway. Currently, most of the top of this embankment consists of earth, while the southern end is rock rip rapped for protection in functioning as an emergency spillway into Foss Creek under very high flood conditions.

d) This project does not involve new housing, commercial or industrial development and therefore will increase demand on water supplies. Some public drinking water facilities may be provided at entrance locations to the pathway, but these would not trigger the need for new or expanded water supply entitlements by the City.

e) See response to 14.a.

f) Implementation of the proposed project would generate short-term construction-related debris and solid waste to be disposed in the County landfill, thereby potentially exacerbating current difficulties of the City of Healdsburg and the County of Sonoma to meet the 50 percent diversion requirement of AB 939 (Integrated Waste Management Act of 1989).

Trash bins will be provided at entrance locations where the path begins, crosses, or ends at City streets, with routine pick-up by the City similar to maintenance requirements at other City parks and recreational facilities. The amount of solid waste that will need to be disposed of from these sources would not be substantial, and would be similar to that typically generated along existing City streets and sidewalks by passing pedestrians and cyclists.

g) See response to item 14.f., above.

Mitigation Measures

To ensure that the project does not adversely affect the current function of the detention basin and thereby potentially increase the risk of downstream flooding, the following mitigation measure shall be incorporated into the project:

Mitigation Measure #12

The project designer shall work with the City of Healdsburg Public Works Department to design the pathway in the vicinity of the Grove Street Detention Basin in such a way to ensure that the function of the detention basin, including inlet and outlet structures, is not impaired in any way.

Timing/Implementation: At the time construction plans for the pathway in the vicinity of the Grove Street detention basin are prepared for the project.

Monitoring/Enforcement: City Public Works Department

To ensure that reduce impacts associated with increases in solid waste generated by project construction are reduced to less than significant, the following measure shall be incorporated into the project:

Mitigation Measure #13

The construction contractor shall recycle waste materials during all construction phases of the project, particularly brush and vegetation removed, and any other materials that are prohibited from landfill disposal.

Timing/Implementation: Conditions to be included in approval of improvements plans, with implementtation by the construction contractor.

Enforcement/Monitoring: City of Healdsburg Planning and Building Department

XV. MANDATORY FINDINGS OF SIGNIFICANCE	Yes	No
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.	☐	☒
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒

a) Implementation of the mitigation measures included in this Initial Study, if incorporated into the project, would avoid any potential impacts that could otherwise result with implementation of the project. This mitigation includes measures to avoid any impacts to special status animals, compensate for the loss of riparian habitat. The project will not eliminate any important examples of California history or prehistory. Mitigation is provided to stop work in the area and notify a qualified archaeologist for inspection and recommendation if unknown buried historical or archaeological materials are accidentally uncovered during project construction.

b) The City of Healdsburg has implemented, or is planning to implement, two other projects involving impacts to Foss Creek and Norton Slough. These include the Grove Street extension project that involved a new bridge crossing Norton Slough, and the Grant Street Bridge reconstruction project, which is planned to widen the existing bridge over Foss Creek. Both projects included, or include, mitigation measures to ensure no net loss of riparian habitat acreage or functions, or the creation of adverse impacts to special status animals. This project also includes mitigation measures to compensate for impacts to riparian habitat, and to avoid impacts to special status animals. Therefore, due to the implementation of these mitigation measures, the project will not have a cumulatively considerable impact in conjunction with the effects of past or future projects on Foss Creek or Norton Slough.

c) Implementation of the mitigation measures included in this Initial Study (e.g., measures to avoid construction-related dust and noise), will avoid any environmental effects that could cause substantial adverse effects on human beings, either directly or indirectly.

REFERENCES

1. City of Healdsburg*, Healdsburg General Plan Policy Document,* adopted August 3, 1987, with text revisions adopted through October 4, 2004
2. City of Healdsburg, *Healdsburg General Plan Background Report*, June 1990, as amended
3. City of Healdsburg, *General Plan Assessment Report (Final EIR),* prepared by J. Laurence Mintier & Associates, July 1987.
4. City of Healdsburg Municipal Code, as amended
5. City of Healdsburg Zoning Ordinance, as amended
6. City of Healdsburg Public Works Department, Engineering Standard Plans and Specifications Manual, as adopted
7. U.S. Federal Emergency Management Agency, Flood Insurance Rate Map (Panel nos. 060378-0005C)
8. U.S. Department of Agriculture, *Soil Survey, Sonoma County, California*, May 1972.
9. *Categorical Exemption/Exclusion Information Summary Report for Healdsburg Train Depot Park and Ridge Project, Draft Report,* Par Environmental Services, Inc., March 2001
10. *Cultural Resources Investigation of the Healdsburg Intercity Intermodal Transportation Center Project, Healdsburg, Sonoma County, California*, Par Environmental Services, Inc., January 2001
11. *Foss Creek Pathway Working Paper #1, Goals and Objectives & Design and Operating Standards*, Alta Design + Planning, July 2005.
12. *Foss Creek Pathway Working Paper #2, Existing Conditions*, Alta Design + Planning, July 2005.
13. *Foss Creek Pathway Working Paper #4, Pathway Design Concept*, Alta Design + Planning, July 2005
14. *Foss Creek Multi-Use Trail Design, Preliminary Trail Layout, Healdsburg, California*, Alta Design + Planning, July 2005
15. *Grant Street/Foss Creek Culvert Crossing Extension Project Initial Study, Healdsburg, California*, Earthcraft Planning Services, April 2003.
16. *Grove Street Extension, Widening, and Trunk Sewer Project, Healdsburg, California*, *Draft and Final Environmental Impact Report,* Earthcraft Planning Services, July and November 1993.
17. *Grove Street Neighborhood Plan Background Report, Healdsburg, California,* Earthcraft Planning Services, April 1998.
18. *Grove Street Neighborhood Plan Initial Study, Healdsburg, California,* Earthcraft Planning Services, September 1999.
19. *Initial Study for Alzheimer's and Elder Care Facilities, 20 West Grant Street*, Earthcraft Planning Services, December 1998.
20. Letter Report to Rob Jones from Jane Valerius, Environmental Consulting, dated April 7, 2003
21. Letter Report to Jane Valerius from Michael Fawcett, Ecologist, dated March 31, 2003

APPENDIX B

Biological Resources Assessment

March 7, 2018 (Updated 3/18/19)

John Wanger, CEO
Coastland Civil Engineering, Inc.
1400 Neotomas Ave.
Santa Rosa, CA 95405

Dear Mr. Wanger:

This letter provides you with the results of a Biological Resources Assessment (BRA) and jurisdictional wetland delineation performed on June 17, 2017, December 19, 2017, and February 5, 2018 at the site of the proposed Foss Creek Pathway Segments 7 and 8 Project (Project), located between the intersection of Healdsburg Avenue and Grove Street, and Grant Street in the western portion of the City of Healdsburg, Sonoma County, California (Study Area, Attachment A - Figure 1). The approximately 10.1-acre Study Area is located along the western edge of the City of Healdsburg within the public right-of-way (ROW). The site consists of a narrow strip of land paralleling Highway 101 and Grove Street to the west. Segment 7 commences from the northern edge of Segment 6, and would include a pedestrian bridge crossing which crosses over Foss Creek and runs through adjacent riparian woodland habitat. Segment 7 continues paralleling Foss Creek and the Northwestern Pacific Railroad tracks from south of Monte Vista Avenue to Dry Creek Road. Segment 8 continues from the northern side of Dry Creek Road to Grove Street, west of the Grove Street and Healdsburg Avenue Intersection).

This report describes the results of the site visit, which assessed the Study Area for: (1) the potential to support special-status plant and wildlife species; (2) the potential presence of sensitive biological communities such as wetlands or riparian habitats; and (3) the potential presence of other sensitive biological resources protected by local, state, and federal laws and regulations. A routine wetland delineation was conducted concurrent with this assessment on June 17, 2017, the results of which are also discussed in this report. Study Area figures are provided in Attachment A. A complete list of observed plant and wildlife species is provided in Attachment B. Biological database search results are provided in Attachment C. Representative photographs of the Study Area are provided in Attachment D. Standard Arid West Wetland Determination Data Forms are provided in Attachment E.

A BRA provides general information on the potential presence of sensitive species and habitats. The BRA is not an official protocol-level survey for listed species that may be required for project approval by local, state, or federal agencies. This assessment is based on information available at the time of the study and on-site conditions that were observed on the date of the site visits.

Project Description

The proposed Project is the construction of Segments 7 and 8 of the existing Foss Creek Pathway, a pedestrian pathway in the City of Healdsburg, Sonoma County, California. The construction of Segments 7 & 8, would complete the Foss Creek Pathway through Reach Four (Foss Creek North Reach) of the original Foss Creek Pathway Project. The Pathway would terminate at the Dry Creek and Grove Road intersection as depicted in the 2006 Initial Study for the Project. The proposed Project would be constructed in an alignment similar to the original project, implement the safety crossing planned for the Dry Creek Road crossing, install the fencing along the pathway, and install the 175 Watt LED light fixtures. The proposed segments of pathway would consist of a 10-foot-wide asphalt concrete paved pathway. All improvements would occur in the public ROW. As the 2006 Initial Study was based on information collected during that time period, this BRA provides an updated assessment of potential sensitive resources present in the Study Area under current conditions.

Regulatory Background

The following natural resources are protected under one or more of several Federal, State and/or local regulations, and were considered when analyzing the potential construction of the Project.

Waters of the U.S.: protected under the Clean Water Act (CWA), administered by the Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers (Corps):

- Includes wetlands, streams, rivers, and other aquatic habitats meeting the guidance issued by the Corps.

Waters of the State: protected under the Porter-Cologne Act, administered by the Regional Water Quality Control Board (RWQCB):

- Includes surface water or groundwater, including saline waters, within the boundaries of the state, and are generally delineated following the guidance issued by the Corps.

Streams, Lakes, and Riparian Habitat: protected under the California Fish and Game Code (CFGC), administered by the California Department of Fish and Wildlife (CDFW):

- Includes creeks and rivers (bodies where water flows at least periodically or intermittently through a bed or channel having banks and supports fish or other aquatic life), and vegetation adjacent to associated with such (riparian habitat).
-

Sensitive Natural Communities: protected under the CFGC, administered by the CDFW:

- Includes terrestrial vegetation or plant communities that are ranked by NatureServe and considered "threatened" or "endangered" by the CDFW, lists of such are included in *List of Vegetation Alliances and Associations* (CDFG 2010).
-

Special-status Plant and Wildlife Species including Critical Habitat: protected under one or more of the Federal Endangered Species Act (ESA), California Endangered Species Act (CESA), California Environmental Quality Act (CEQA), administered by the U.S. Fish and Wildlife Service (USFWS), and/or CDFW:

- Includes plant listed under the ESA and/or CESA, or those plants ranked by the California Native Plant Society as Rank 1, 2, and (occasionally) 3, and 4.
- Includes wildlife listed under the ESA and/or CESA, and those wildlife listed by CDFW as Species of Special Concern, Fully Protected Species, and/or Special-status Invertebrates, species listed by USFWS Birds of Conservation Concern, as well as bats listed as Medium or High Priority by the Western Bat Working Group (WBWG).

- In addition to regulations for special-status species, most birds in the United States, including non-status species, are protected by the Migratory Bird Treaty Act (MBTA) of 1918. Under this legislation, destroying active nests, eggs, and young is illegal.

City of Healdsburg Tree Ordinance: protects certain “heritage trees” on public and private lands within city limits

- Heritage trees are defined by the Tree Ordinance as “any tree that has a diameter of thirty (30) inches or more, measured two (2) feet above the level ground,” or any tree or group of trees identified by City Council resolution as being worthy of heritage tree protection due to historic or cultural value to the community.
- A tree permit from the City of Healdsburg is required for the removal, relocation or for conducting ground disturbance work within the protected zone (area within the dripline, from the trunk of the tree to the outer extent of the tree canopy) of any heritage tree as defined above.
- The design review application process requires a survey of all “trees”, as defined per the Tree Ordinance within the Study Area. A tree is defined by the Tree Ordinance as “any woody perennial plant with a single trunk diameter of six (6) inches or more or a combination of multiple trunks with a total diameter of twelve (12) inches or more, measured four and one-half (4.5) feet above the average natural grade.”

Survey Methods

Multiple site visits to the Study Area were conducted on June 17, 2017, December 19, 2017, and February 5, 2018. Prior to the site visits, background literature was reviewed to determine potential presence of sensitive vegetation types, aquatic communities (e.g. wetlands), and special-status plant and wildlife species. Resources reviewed for sensitive biological communities and aquatic features include:

- *A Flora of Sonoma County* (Best et al. 1996);
- *A Manual of California Vegetation, Online Edition* (CNPS 2018b);
- Aerial photographs (Google Earth 2018);
- *California Amphibian and Reptile Species of Special Concern* (Thomson et al. 2016);
- *California Bird Species of Special Concern* (Shuford and Gardali 2008);
- California Department of Fish and Game publication “California’s Wildlife, Volumes I-III” (Zeiner et al. 1990);
- California Native Plant Society Electronic Inventory for the Healdsburg, Jimtown, Guerneville, and Geyserville 7.5-minute quadrangles (CNPS 2018a);
- California Natural Diversity Database for the Healdsburg, Jimtown, Guerneville, and Geyserville 7.5-minute quadrangles (CNDDB; CDFW 2018a);
- Consortium of California Herbaria (CCH 2018);
- Healdsburg and Jimtown 7.5-minute quadrangles (United States Geological Survey [USGS] 1993a, 1993b);
- Maps for the California Essential Habitat Connectivity Project (CDFW 2018c).
- National Marine Fisheries California Species List Generator (NMFS 2018);
- Online Soil Survey (California Soil Resources Lab [CSRL] 2018);
- Sonoma County Breeding Bird Atlas (Burridge 1995);
- USFWS National Wetlands Inventory Database (USFWS 2018a)

- USFWS Information for Conservation and Planning (IPaC) search (USFWS 2018b);
- USFWS Critical Habitat Mapper (USFWS 2018c); and
- Western Bat Working Group, species accounts (WBWG 2018).

During the site visits, the Study Area was examined for: (1) the potential to support special-status plant and wildlife species; (2) the potential presence of sensitive biological communities such as wetlands or riparian habitats; and (3) the potential presence of other sensitive biological resources protected by local, state, and federal laws and regulations (e.g. City of Healdsburg General Plan and Code of Ordinances, California Environmental Quality Act [CEQA], and the Clean Water Act [CWA]).

Results

Six biological communities were observed in the Study Area including seasonal wetland, perennial stream, riparian woodland, non-native grassland, developed/landscaped, and disturbed areas. Of the communities observed in the Study Area, seasonal wetland, perennial stream, and riparian woodland are considered sensitive, and the remainder are considered non-sensitive. Biological communities observed in the Study Area are discussed in detail below. A map depicting biological communities within the Study Area is presented in Attachment A, Figure 2. Database maps and information indicate that 38 special-status plant species and 52 special-status wildlife species have been documented in the vicinity of the Study Area (Attachment A - Figures 2 and 3, respectively). Three special-status plant species and four special-status wildlife species were determined to have a moderate potential to occur within the Study Area; they are discussed below.

Biological Communities

The majority of the Study Area is characterized as non-native annual grassland, which is not considered a sensitive biological community. Three potentially sensitive biological communities, seasonal wetland, perennial stream, and riparian woodland, were identified in the Study Area. Biological communities present in the Study Area were classified based on existing plant community descriptions described in *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), and *A Manual of California Vegetation, Online Edition* (CNPS 2018b, CDFW 2018b), where possible; however, in some cases it was necessary to identify variants of community types or communities that are not described in the literature. Biological communities present within the Study Area are shown in Figure 1 and described below.

<u>Sensitive Biological Communities</u>

Seasonal Wetland. The Study Area contains approximately 0.25 acre of seasonal wetland. Seasonal wetlands are known throughout California on all aspects and topographic positions, and are typically underlain by clay-rich to loam soils. Seasonal wetlands within the Study Area are located in predominantly linear depressional swales and man-made ditches along the railroad tracks. Hydrology sources supporting these features appear to be direct precipitation and under- and over-land sheet flow, from adjacent uplands which forms a perched water table within the upper portion of the soil profile. Vegetation within seasonal wetlands in the Study Area was typically dominated by facultative grasses including Italian ryegrass (*Festuca perennis*, FAC[1]), and Mediterranean barley (*Hordeum marinum*, FAC), with other hydrophytic grasses and forbs present including English plantain (*Plantago lanceolata*, FAC), tall flatsedge (*Cyperus eragrostis,* FACW), annual beard grass (*Polypogon monspeliensis*, FACW), bristly ox-tongue (*Helminthotheca echioides*, FAC)*,* dallis grass (*Paspalum dilatatum*, FAC), and bird's foot trefoil (*Lotus corniculatus*, FAC). Areas mapped as perennial wetland contain a prevalence or dominance of hydrophytic vegetation hydric soils, and wetland hydrology sufficient to meet the requirements as jurisdictional features under Section 404 of the CWA.

Perennial Stream (Foss Creek). One perennial stream, Foss Creek, is present within the Study Area, occupying approximately 0.11 acre (173.8 linear feet). This feature is shown as a solid blue line on the Healdsburg and Jimtown 7.5-miniute topographic quadrangles (USGS 1993a, 1993b) and is labeled variably as "Foss Creek" and "Norton Slough". Foss Creek flows through the Study Area in a southerly direction. Foss Creek within the Study Area is approximately 8 to 10 feet wide between Ordinary High Water Marks (OWHM) and top of bank (TOB) (i.e. OHWM and TOB are equivalent). Foss Creek contains perennial flows and had flowing water during each of the site visits. The channel substrate is composed of a mix of sorted sediments, including silts, gravels, and cobbles. The vegetation on either side of the stream is composed of mixed riparian woodland described below. Areas mapped as intermittent stream are jurisdictional under Section 404 of the CWA and Section 1602 of the CFGC.

Mixed Riparian Woodland. Mixed riparian woodland occupies approximately 0.60 acre in the Study Area. Mixed riparian woodland within the Study Area contains a mixture typically riparian species at or directly above the OHWM of Foss Creek, including arroyo willow (*Salix lasiolepis*), red willows (*S. laevigata*) and Oregon ash (*Fraxinus latifolia*), which transitions to large mature coast live oak (*Quercus agrifolia*) trees above TOB of Foss Creek. The understory is typically dominated by a mixture of native and non-native woody vines including Himalayan blackberry (*Rubus armeniacus*), and poison oak (*Toxicodendron diversilobum*) at and above TOB, and other native and non-native shrubs, grasses and forbs are present including California blackberry (*Rubus ursinus*), French broom (*Genista monspessulana*), Harding grass (*Phalaris aquatica*), and big periwinkle (*Vinca major*). Mixed riparian woodland is considered a sensitive community under Section 1602 of the CFGC, and this community also contains individual trees protected per the City of Healdsburg Tree Ordinance.

Non-Sensitive Biological Communities

Non-native Annual Grassland. Non-native annual grassland comprises approximately 5.57 acres of the Study Area. This community is dominated by a mix of non-native annual grasses typical of disturbed areas. Dominant grass species included rattlesnake grass (*Briza maxima*) slim oat (*Avena barbata*), soft chess (*Bromus hordeaceus*), Harding grass, and ripgut brome (*Bromus diandrus*). Other predominantly non-native forbs dominant or present within this community include English plantain, bristly ox-tongue, prickly lettuce (*Lactuca serriola*), big heron bill (*Erodium botrys*), California poppy (*Eschscholzia californica*), coastal tarweed (*Madia sativa*), yellow starthistle (*Centaurea solstitialis*), and field bindweed (*Convolvulus arvensis*). Scattered trees and shrubs are present but in low overall cover, including coyote brush (*Baccharis pilularis*),

---

[1] OBL = Obligate, always found in wetlands (> 99% frequency of occurrence); FACW = Facultative wetland, usually found in wetlands (67-99% frequency of occurrence); FAC = Facultative, equal occurrence in wetland or non-wetlands (34-66% frequency of occurrence).

valley oak (*Quercus lobata*), and coast live oak. Non-native annual grassland is not considered a sensitive biological community.

Developed/landscaped. Developed and/or landscaped areas comprise approximately 3.12 acres of the Study Area. Developed/landscaped areas include the railroad tracks, paved roads, buildings, a ballfield, and associated ornamental landscaping. Vegetation within these areas, if present, is dominated by non-native ornamental or planted native trees including coast redwood (*Sequoia sempervirens*), London plane (*Platanus* x *acerifolia*). Devleoped/landscaped areas are not considered a sensitive biological community.

Disturbed. Approximately 0.46 acre of disturbed area occurs in the Study Area, in the northernmost portion of the Study Area. This area is composed of an undeveloped gravel parking lot that is nearly completely devoid of vegetation. Disturbed areas are not considered a sensitive biological community.

Heritage Trees

A tree survey was conducted by an ISA-Certified Arborist concurrent with the December 19, 2017, and February 5, 2018 site visits (WRA 2018). The survey identified a total of 86 trees within the Study Area including seven heritage trees, and 79 non-heritage trees. A total of 22 trees are anticipated to be removed by the Project, one of which is large enough to be considered a heritage tree.

Special-Status Species

<u>Special-Status Plant Species</u>

Based upon a search of the databases listed above, 39 special-status plant species have documented occurrences within the vicinity of the Study Area, defined to include the Healdsburg, Jimtown, Guerneville, and Geyserville 7.5-minute USGS quadrangles; CNDDB occurrences of these species within 5 miles of the Study Area are shown in Figure 3. Of the 39 special-status species documented, three were determined to have a moderate potential to occur in the Study Area and are discussed in Table 1 below. The remainder of these species are either unlikely or have no potential to occur within the Study Area for one or more of the following reasons:

- The Study Area has been repeatedly and intensively disturbed by mowing or weed whipping thereby eliminating the seedbank or diminishing establishment of the special-status plant(s);
- The Study Area does not contain hydrologic conditions (e.g., brackish or salt marsh) necessary to support the special-status plant(s);
- The Study Area does not contain edaphic (soil) conditions (e.g., serpentine, volcanics) necessary to support the special-status plant(s);
- The Study Area does not contain vegetation communities (e.g., chaparral, vernal pools) associated with the special-status plant(s);

Table 1. Special-status Plant Species with the Potential to Occur in the Study Area.

SPECIES / STATUS	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN THE STUDY AREA
Johnny-nip *Castilleja ambigua* var. *ambigua* CNPS Rank 4	Coastal bluff scrub, coastal prairie, coastal scrub, marshes and swamps, valley and foothill grassland, vernal pools margins. Elevation ranges from 0 to 1425 feet. Blooms Mar-Aug.	**Moderate Potential (Not Observed).** The Study Area contains potentially suitable mesic grassland habitat and seasonal wetlands that could potentially support this species. However, this species was not observed during the site visit conducted during the species' bloom period. No further actions recommended for this species.
congested-headed hayfield tarplant *Hemizonia congesta* ssp. *congesta* CNPS Rank 1B	Valley and foothill grassland/sometimes roadsides. Elevation ranges from 70 to 1840. Blooms Apr-Nov.	**Moderate Potential (Not Observed).** The Study Area contains potentially suitable grassland habitat that could support this species. However, this species was not observed during the site visit conducted during the species' bloom period. No further actions recommended for this species.
marsh microseris *Microseris paludosa* CNPS Rank 1B	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland. Elevation ranges from 15 to 1165 feet. Blooms Apr-Jun (Jul).	**Moderate Potential (Not Observed).** The Study Area contains potentially suitable grassland habitat that could support this species. However, this species was not observed during the site visit conducted during the species' bloom period. No further actions recommended for this species.

Special-status Wildlife Species

No special-status wildlife species were observed during the site visit. A total of 52 special-status wildlife species have been documented within the vicinity of the Study Area; CNDDB occurrences of these species within 2 miles of the Study Area are shown in Figure 4. Forty-eight of these species are unlikely or have no potential to occur within the Study Area due to one or more of the following reasons:

- The Project avoids all impacts to habitats that are potentially occupied by species (i.e. the path will fully bridge Foss Creek above the top of bank and will therefore avoid impacts to all fish or other aquatic species);
- Suitable estuarine, or tidal habitats are absent;
- Vegetation communities (e.g., old-growth coniferous forest, emergent marsh, expansive grassland) required to support nesting and/or foraging by special-status species are not present in the Study Area;
- Structures such as caves, abandoned buildings, or standing snags necessary to provide roosting habitat are not present in the Study Area;
- The Study Area is outside (e.g., north of, west of) the species local documented range, or specifically breeding/nesting range (generally applies to birds);
- The Study Area is inundated by anthropogenic disturbances which make the habitat unsuitable for the species.

The absence of such habitat features along the Study Area's length eliminates components critical to the survival or movement of most special-status species. Species like California red-legged frog (*Rana draytonii*; federal threatened) may occur in natural, less modified habitats in the vicinity; but the level of development surrounding the Study Area, as well as the lack of suitable aquatic breeding habitat makes this species unlikely to occur. Additionally, steelhead (*Oncorhynchus mykiss irideus*) may use Foss Creek for rearing or spawning. However, the only portion of the Project with potential to interact with the creek is at the bridge crossing. According to the measures laid out in the Initial Study, the bridge has been designed to fully span the creek, and will not impact any areas below the high water mark. Given this design, no impediments to migration or affects to the creek will occur and all potential effects to steelhead are avoided.

Four special-status wildlife species (three birds, one reptile) were assessed as having potential to occur within the Study Area. These species are detailed in Table 2 below.

Table 2. Special-status Wildlife Species with the Potential to occur in the Study Area.

SPECIES / STATUS	HABITAT REQUIREMENTS	POTENTIAL TO OCCUR IN THE STUDY AREA
loggerhead shrike *Lanius ludovicianus* (USFWS Bird of Conservation Concern, CDFW Species of Special Concern)	Year-round resident in open woodland, grassland, savannah and scrub. Prefers areas with sparse shrubs, trees, posts, and other suitable perches for foraging. Preys upon large insects and small vertebrates. Nests are well-concealed in densely-foliaged shrubs or trees.	**Moderate Potential.** The Study Area a mix of open grasslands and large trees that may provide suitable nesting and foraging habitat for this species.
Nuttall's woodpecker *Picoides nuttallii* (USFWS Bird of Conservation Concern)	Year-round resident in lowland woodlands throughout much of California west of the Sierra Nevada. Typical habitat is dominated by oaks; also occurs in riparian woodland. Nests in tree cavities.	**Moderate Potential.** The Study Area contains a mix of open grasslands and large trees that may provide suitable cavities to support nesting by this species. This species has been observed in the local area (Burridge 1995).
oak titmouse *Baeolophus inornatus* (USFWS Bird of Conservation Concern)	Occurs year-round in woodland and savannah habitats where oaks are present, as well as riparian areas. Nests in tree cavities.	**Moderate Potential.** The Study Area contains a mix of open grasslands and large trees that may provide suitable cavities to support nesting by this species. This species has been observed in the local area (Sullivan 2018).
Western pond turtle *Actinemys marmorata* (CDFW Species of Special concern)	A thoroughly aquatic turtle of ponds, marshes, rivers, streams and irrigation ditches with aquatic vegetation. Require basking sites such as partially submerged logs, vegetation mats, or open mud banks, and suitable upland habitat (sandy banks or grassy open fields) for egg-laying.	**Moderate Potential.** This species has been documented downstream of the Study Area within Foss Creek. Because the species may leave the stream channel and occur in the surrounding uplands under specific circumstances, this species has a moderate potential to occur.

General Wildlife

General (non-status) wildlife expected to be present within the vicinity of the Study Area are primarily common species affiliated with grassland, and urban environments. Many of these species also exhibit adaptations to urban environments and anthropogenic disturbance. The Study Area provides foraging and nesting habitat for variety of locally common bird species, the majority of which have baseline legal protections under the federal Migratory Bird Treaty Act (MBTA) and the California Fish and Game Code (CFGC). Under these laws/codes, deliberately destroying the active nests (those with eggs or young) of these species is illegal. Depending on species, nesting may occur in trees (both in foliage and cavities), other vegetation, or even on the ground.

Common mammal species such as Botta's pocket gopher (*Thomomys bottae*), western harvest mouse (*Reithrodontomys megalotis*) as well as widespread, urban-adapted mammals such as raccoon (*Procyon lotor*) and striped skunk (*Mephitis mephitis*) are also presumably present within the Study Area. Reptile species adapted to disturbed/urban environments, such as western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarnata*) and gopher snake (*Pituophis catenifer*) are common in much of Sonoma County and likely present within the Study Area. Amphibians that are present include the very common tree frog (*Pseudacris regilla*).

Wildlife Corridors

Wildlife movement between suitable habitat areas can occur via open space areas lacking substantial barriers. The key to a functioning corridor or linkage is that it connects two larger habitat blocks, also referred to as core habitat areas (Beier and Loe 1992, Soule and Terborgh 1999). The term "wildlife corridor" is useful in the context of smaller, local area planning, where wildlife movement may be facilitated by specific local biological habitats or passages and/or may be restricted by barriers to movement. Above all, wildlife corridors must link two areas of core habitat and should not direct wildlife to developed areas or areas that are otherwise void of core habitat (Hilty et al. 2006).

The Study Area is primarily bounded to the east and west by development associated with the City of Healdsburg. At the southern end of the Study Area, a bridge is proposed that would cross Foss Creek. Foss Creek may serve as a wildlife corridor in two ways: (1) local wildlife may use the riparian corridor as cover to move between habitats, or (2) various species of fish may spawn, or rear within Foss Creek and migrate through its waters in order to reach additional habitats downstream. The bridge across Foss Creek is not expected to impact the bed, or banks of the creek, therefore the Project will not create an impediment to fish migration. Additionally, any local wildlife which are present in the area would be accustomed to anthropogenic disturbances due to the numerous bridges and roads that cross Foss Creek. Therefore, it is not anticipated that the Project will impede the function of Foss Creek as a migration corridor.

Recommendations

Analysis of Potential Effects to Sensitive Vegetation Communities

Wetlands and Waters of the U.S.

A jurisdictional wetland delineation was done concurrent with the June 17, 2017 site visit. The Study Area contains approximately 0.25 acre of seasonal wetlands, and 0.11 acre (173.8 linear feet) of perennial stream which are potentially within the jurisdiction of the Corps under Section 404 of the Clean Water Act and RWQCB under the Porter Cologne Act and Section 401 of the Clean Water Act. The proposed Project will impact approximately 0.06 acre of seasonal wetland, and 0.01 acre of perennial stream via pathway construction. Impacts to jurisdictional features would require permitting from regulatory agencies. These permits would likely include:

- Section 404 Nationwide Permit from the Corps
- Section 401 Water Quality Certification from the RWQCB

A Section 404 permit would require mitigation for impacts to jurisdictional wetlands and non-wetland waters. Required mitigation may include a mitigation and monitoring plan to ensure environmental impacts are mitigated and the sensitive habitats are returned to a natural state after the project is complete. Wetland mitigation requirements will be determined by the regulatory agencies during the permitting process. Required mitigation ratios can be met by creating wetlands on-site or off-site or purchasing wetland credits from a wetland mitigation bank.

Riparian Habitat

The Study Area contains 0.60 acre of mixed riparian woodland which is potentially subject to CDFW jurisdiction under Section 1602 of the CFGC. The proposed Project will impact approximately 0.12 acre of mixed riparian woodland via pathway construction. Impacts to riparian habitat would require a CFGC Section 1602 Streambed Alteration Agreement from CDFW. The project shall comply with all regulatory agency permit conditions and compensatory mitigation measures as determined and required by regulatory agencies during permit authorization. Mitigation options may include the following: (1) planting replacement riparian vegetation, (2) purchase of mitigation bank credits from an approved mitigation bank, and/or (3) paying an in-lieu fee to a natural resource agency or habitat resource organization.

For habitat that is preserved and/or established for mitigation, a Habitat Mitigation and Monitoring Plan (HMMP) would likely be required. The HMMP will include a detailed description of restoration/enhancement/preservation actions; restoration performance criteria for each biological parameter (i.e., native/invasive plants, wildlife use); and a monitoring/maintenance/reporting requirements for each biological parameter to evaluate restoration performance criteria.

Analysis of Potential Effects to Heritage Trees

One heritage tree is likely to be removed as part of the Project. Removal of the heritage tree is anticipated to require a permit from the City of Healdsburg.

Analysis of Potential Effects to Special-Status Species

Special-Status Plant Species

Based on the disturbed nature of the site, and lack of associated natural vegetation communities, and/or lack of unique edaphic conditions such as serpentine substrate, the Study Area provides potential habitat for only three of the 38 special-status plant species documented within the vicinity of the Study Area, Johnny-nip, congested headed hayfield tarplant, and marsh microseris. The June 2017 site was conducted during the bloom period of these species, and these species were not observed. No impacts to special-status plant species are anticipated as a result of the proposed Project, and no further actions are recommended for special-status plant species.

Special-Status and Non-Special-Status Nesting Birds

The three special-status bird species assessed as having the potential to occur within the Study Area consist of loggerhead shrike, Nuttall's woodpecker, and oak titmouse. In addition to these species, a variety of other native raptors and songbird species with baseline legal protection under MBTA and CFGC have the potential to nest within the Study Area.

To avoid adverse impacts to nesting birds due to project activities within the Study Area, the following minimization measures are recommended:

- If possible, initial ground disturbance and/or vegetation removal should occur during the non-nesting season (August 16 to January 31). No pre-construction surveys would be required during this period.
- If initial ground disturbance and/or vegetation removal occurs during the nesting season (February 1 through August 15), a qualified biologist should conduct a nesting bird survey no more than 14 days prior to ground disturbance to determine if any birds are nesting within or adjacent to project impact areas.
- If active nests are found within project impact areas or close enough to these areas to be affected by project activities, the biologist should establish an appropriate exclusion zone around the nest. This exclusion zone may be modified depending upon the species, nest location, and existing visual buffers and ambient sound levels. Once all young have become independent of the nest (or the nest otherwise becomes inactive), work may take place in the former exclusion zone.
- If initial ground disturbance is delayed or there is a break in project activities of greater than 14 days within the nesting season, then a follow-up nesting bird survey should be performed to ensure no nests have been established in the interim.

Western Pond Turtle

Western pond turtle has been identified in the Initial Study as having potential to occur. The only portion of the Study Area that has potential to interact with this species is at the bridge crossing.

To avoid adverse impacts to western pond turtle the following minimization measures are recommended:

- Prior to initiation of initial ground disturbance or vegetation removal around the proposed bridge, a qualified biologist should perform a preconstruction survey. If any pond turtles are observed within the construction area, the animal should be allowed to leave the area on its own.
- Any open holes or trenches should be fully covered, or backfilled at the end of the day to prevent turtles or other wildlife from falling into said features and becoming trapped.
- To avoid impacts to aquatic habitats staging, or maintenance of equipment should occur outside of the top of bank within previously developed or disturbed areas.
- During refueling, any equipment within 50 feet of the Creek should use appropriate secondary containment to prevent spills or contamination.
- All vehicles operating near the creek should be checked daily for leaks.

With the implementation of surveys, exclusion buffers, and minimization measures, construction within the Study Area is unlikely to affect special-status and non-special-status species.

Please contact me if you have any questions or require clarification regarding any aspect of this report.

Sincerely,

Scott Yarger
Biologist

Enclosures: Attachment A – Figures
Attachment B – List of Observed Plant and Wildlife Species
Attachment C – Database Search Results
Attachment D – Representative Photographs
Attachment E – Wetland Determination Data Forms

References

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, 2nd Edition. University of California Press, Berkeley, CA.

Beier, P. and S. Loe. 1992. A checklist for evaluating impacts to wildlife movement corridors. Wildlife Society Bulletin 20:434-440.

Burridge, B., 1995. Sonoma County breeding bird atlas. Madrone Audubon Society.

California Department of Fish and Game (CDFG). 2010. List of Vegetation Alliances and Associations. Vegetation Classification and Mapping Program. Sacramento, CA. September.

California Department of Fish and Wildlife (CDFW). 2018a. California Natural Diversity Database (CNDDB), Wildlife and Habitat Data Analysis Branch. Sacramento. Most recently accessed: March 2018.

California Department of Fish and Wildlife (CDFW). 2018b. Natural Communities – Background Information. Biogeographic Data Branch. Available online at: http://www.dfg.ca.gov/biogeodata/vegcamp/natural_comm_background.asp; most recently accessed: March 2018.

California Department of Fish and Wildlife (CDFW). 2018c. Biogeographic Data Branch, Biogeographic Information and Observation System online mapping tool, Sacramento, CA. Accessed: April 2017.

California Invasive Plant Council (Cal-IPC). 2018. California Invasive Plant Inventory Database. California Invasive Plant Council, Berkeley, CA. Online at: http://www.cal-ipc.org/ip/inventory/index.php; most recently accessed: March 2018.

California Native Plant Society (CNPS). 2018a. Online Inventory of Rare, Threatened, and Endangered Plants of California. Available at: http://www.rareplants.cnps.org; most recently accessed: March 2018.

California Native Plant Society (CNPS). 2018b. A Manual of California Vegetation, Online Edition. Sacramento, California. Online at: http://vegetation.cnps.org/; most recently accessed: March 2018.

California Soil Resources Lab (CSRL). 2018. Online Soil Survey. Online at: http://casoilresource.lawr.ucdavis.edu/drupal/; most recently accessed: March 2018.

Consortium of California Herbaria. 2018. Data provided by the participants of the Consortium of California Herbaria. Available online at: http://ucjeps.berkeley.edu/consortium/; most recently accessed: March 2018.

Google Earth. 2018. Aerial Imagery 1993-2017. Most recently accessed: March 2018.

Hilty, J.A., W.Z. Lidicker Jr., and A.M. Merenlender. 2006. Corridor Ecology. Pp. 195-198. Island Press, Washington D.C.

Holland, R.F. 1986. Preliminary Descriptions of the Terrestrial Natural Communities of California. Prepared for the California Department of Fish and Game, Sacramento, CA.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

NatureServe. 2018. NatureServe Conservation Status. Available at: http://www.natureserve.org/explorer/ranking; most recently accessed: March 2018.

National Marine Fisheries Service (NMFS). 2018. California Species List Tools. Maps and Data. Available Online: http://www.westcoast.fisheries.noaa.gov/maps_data/california_species_list_tools.html. Most recently Accessed: March 2018.

Shuford, W.D. and T. Gardali, editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

Soulé, M.E. and J. Terbough. 1999. Conserving nature at regional and continental scales - a scientific program for North America. Bioscience 49:809-817.

Thomson, R.C., A.N. Wright, and H.B. Shaffer. 2016. California Amphibian and Reptile Species of Special Concern. Co-published by the California Department of Fish and Wildlife and University of California Press. Oakland, California.

U.S. Fish and Wildlife Service (USFWS). 2018a. National Wetlands Inventory. Available at: http://www.fws.gov/wetlands/index.html; most recently accessed: March 2018.

U.S. Fish and Wildlife Service (USFWS). 2018b. Information for Conservation and Planning Database. Available online at: https://ecos.fws.gov/ipac/; most recently accessed: March 2018.

U.S. Fish and Wildlife Service (USFWS). 2018c. ECOS – Environmental Conservation Online System. U.S. FWS Threatened & Endangered Species Active Critical Habitat Report. Sacramento Fish and Wildlife Office. Available onlinehttps://ecos.fws.gov/ecp/report /table/critical-habitat.html; most recently accessed March 2018.

U.S. Geological Survey (USGS). 1993a. Healdsburg 7.5 minute topographic map.

U.S. Geological Survey (USGS). 1993b. Jimtown 7.5 minute topographic map.

Western Bat Working Group (WBWG). 2018. Species accounts. Prepared by: Betsy C. Bolster. Available online at: http://wbwg.org/western-bat-species/. Accessed March 2018

Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White. 1990. California's Wildlife, Volume I-III: Amphibians and Reptiles, Birds, Mammals. California Statewide Wildlife Habitat Relationships System, California Department of Fish and Game, Sacramento.

Attachment A -

Figures

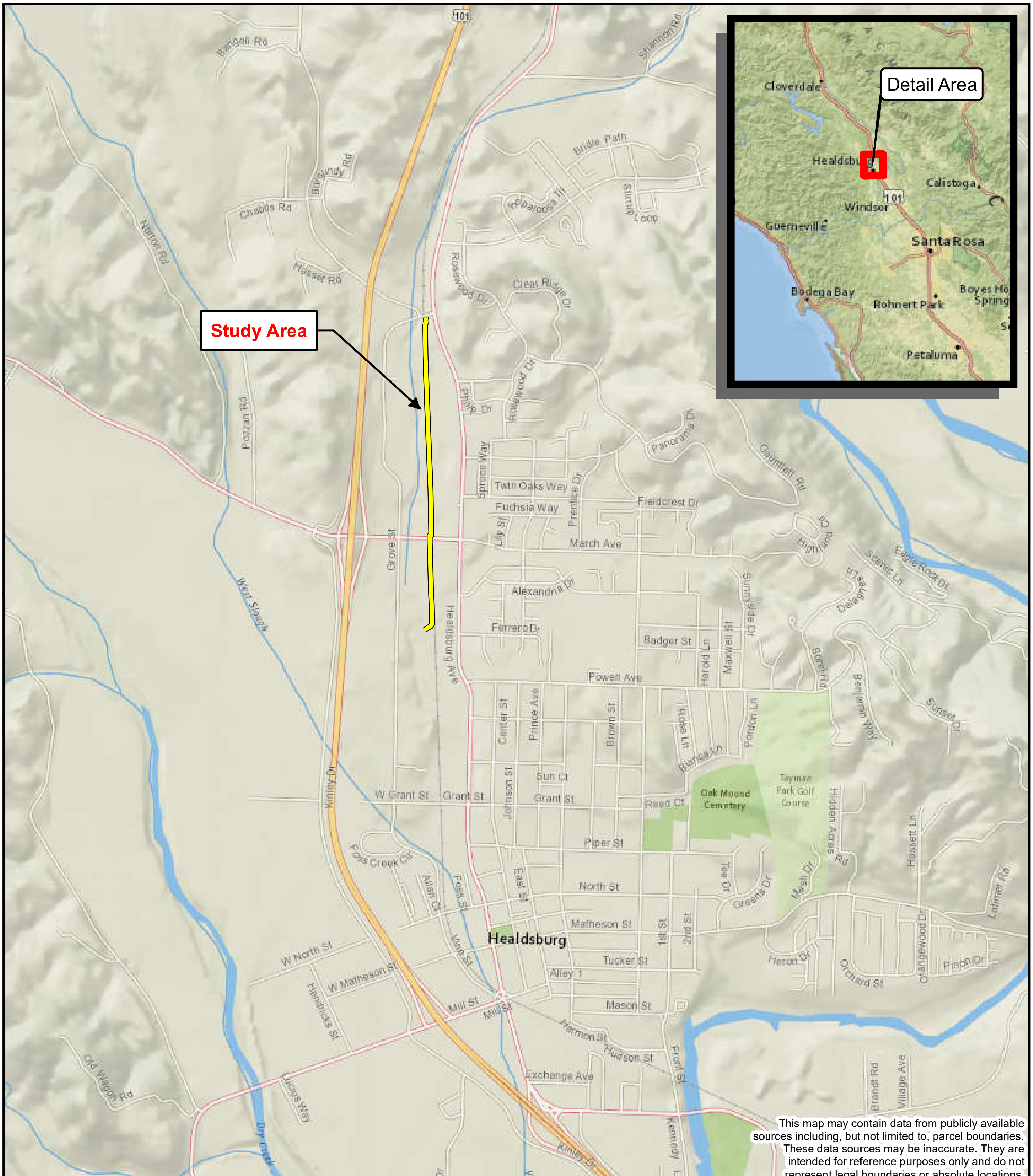


Figure 1. Location

N
W E
S

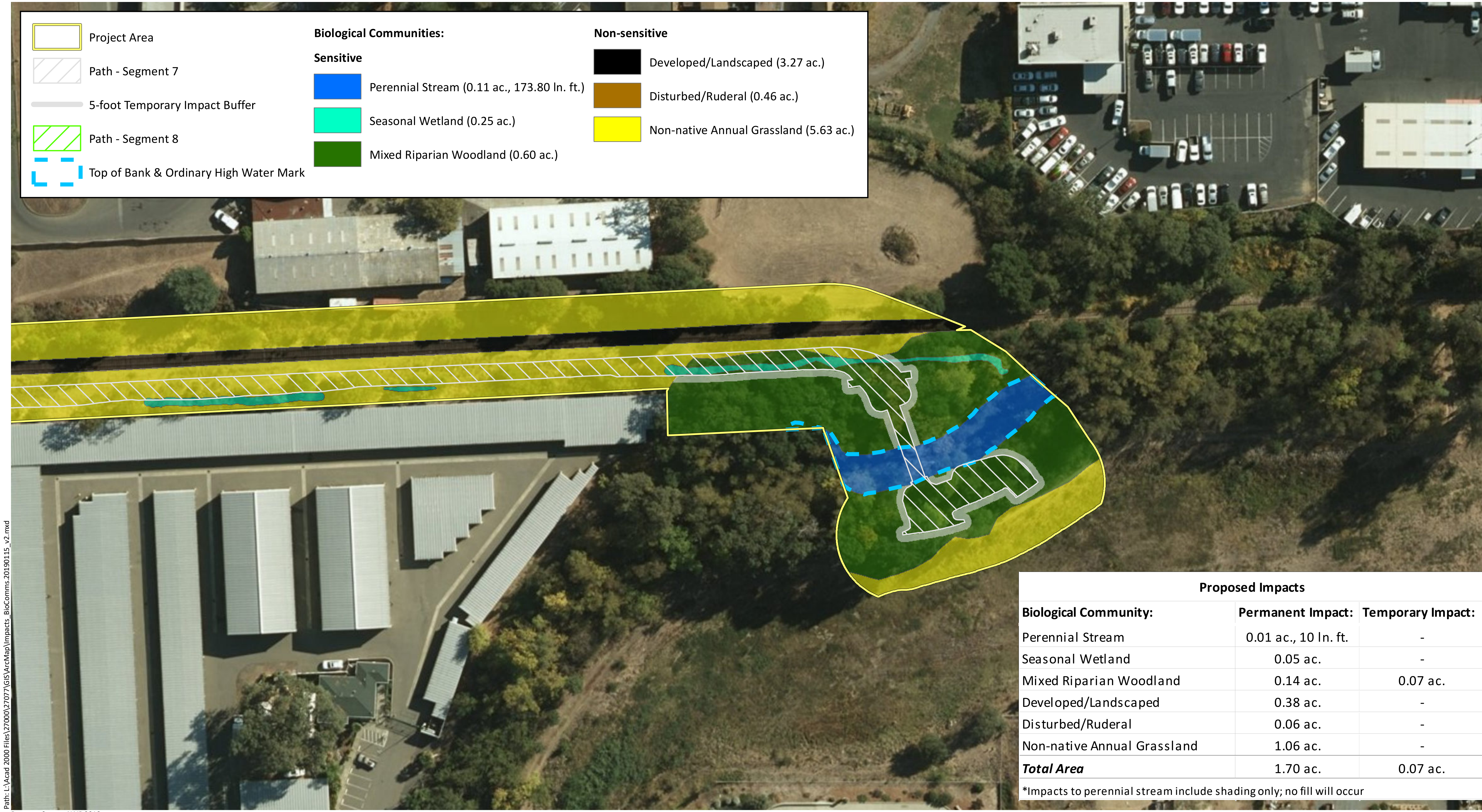
Coastland Healdsburg CEQA and Permitting
Healdsburg, California

0 0.25 0.5
Miles

ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 2/22/2018
Map Prepared By: smortensen
Base Source: Esri Streaming - National Geographic
Data Source(s): WRA

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Location.mxd



Proposed Impacts

Biological Community:	Permanent Impact:	Temporary Impact:
Perennial Stream	0.01 ac., 10 ln. ft.	-
Seasonal Wetland	0.05 ac.	-
Mixed Riparian Woodland	0.14 ac.	0.07 ac.
Developed/Landscaped	0.38 ac.	-
Disturbed/Ruderal	0.06 ac.	-
Non-native Annual Grassland	1.06 ac.	-
Total Area	1.70 ac.	0.07 ac.

*Impacts to perennial stream include shading only; no fill will occur

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Impacts_BioComms.20190115_v2.mxd

Basemap Source: NAIP 2016

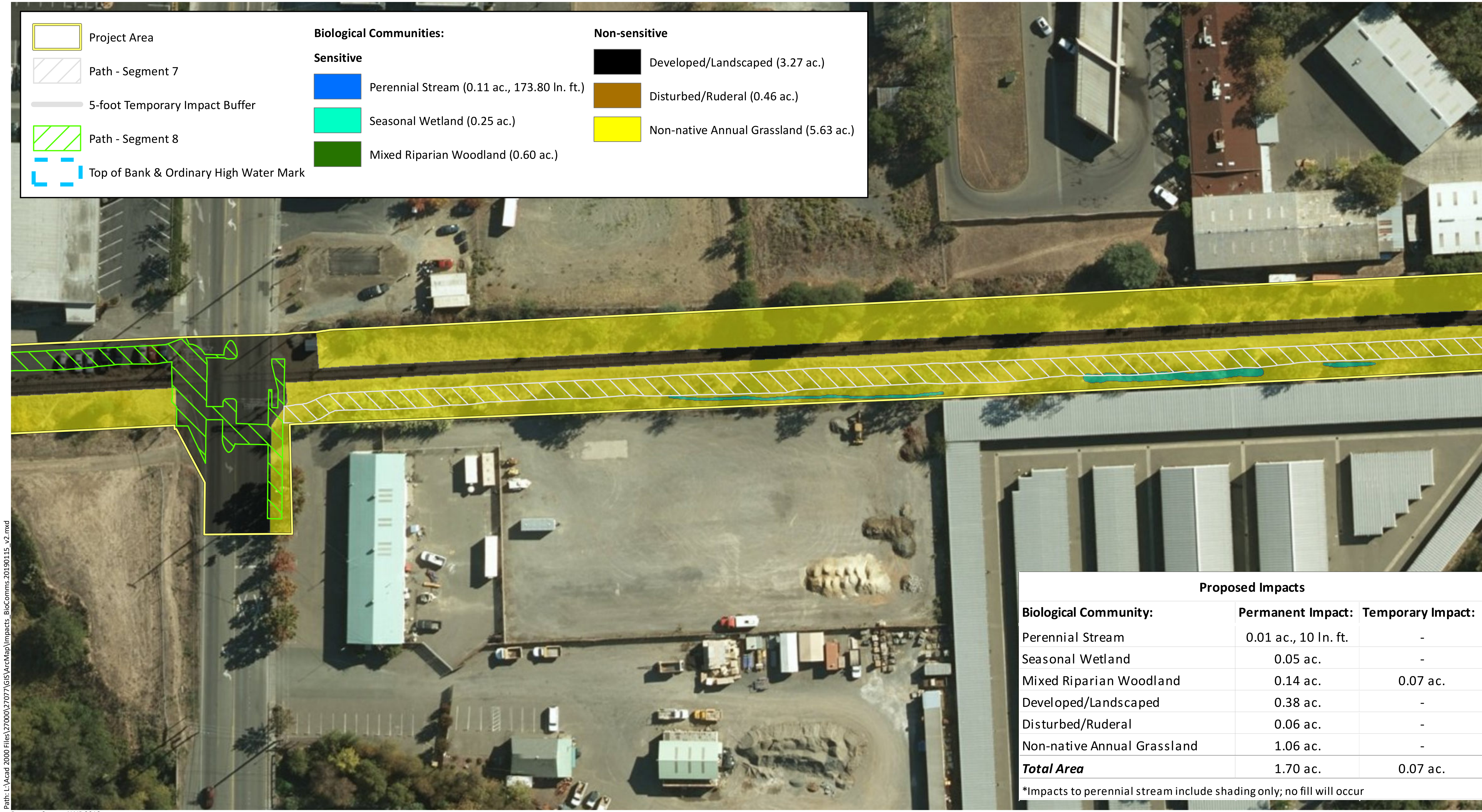
Figure 2. Proposed Impacts to Biological Communities in the Project Area

Coastland Healdsburg CEQA and Permitting
Healdsburg, Sonoma County, California

0 37.5 75 150
Feet
N

ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 1/15/2019
Map Prepared By: mweidenbach
Data Source(s): WRA



Proposed Impacts

Biological Community:	Permanent Impact:	Temporary Impact:
Perennial Stream	0.01 ac., 10 ln. ft.	-
Seasonal Wetland	0.05 ac.	-
Mixed Riparian Woodland	0.14 ac.	0.07 ac.
Developed/Landscaped	0.38 ac.	-
Disturbed/Ruderal	0.06 ac.	-
Non-native Annual Grassland	1.06 ac.	-
Total Area	1.70 ac.	0.07 ac.

*Impacts to perennial stream include shading only; no fill will occur

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Impacts_BioComms.20190115_v2.mxd

Basemap Source: NAIP 2016

Figure 2. Proposed Impacts to Biological Communities in the Project Area

Coastland Healdsburg CEQA and Permitting
Healdsburg, Sonoma County, California

0 37.5 75 150 Feet

N

wra
ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 1/15/2019
Map Prepared By: mweidenbach
Data Source(s): WRA

Proposed Impacts

Biological Community:	Permanent Impact:	Temporary Impact:
Perennial Stream	0.01 ac., 10 ln. ft.	-
Seasonal Wetland	0.05 ac.	-
Mixed Riparian Woodland	0.14 ac.	0.07 ac.
Developed/Landscaped	0.38 ac.	-
Disturbed/Ruderal	0.06 ac.	-
Non-native Annual Grassland	1.06 ac.	-
Total Area	1.70 ac.	0.07 ac.

*Impacts to perennial stream include shading only; no fill will occur

Basemap Source: NAIP 2016

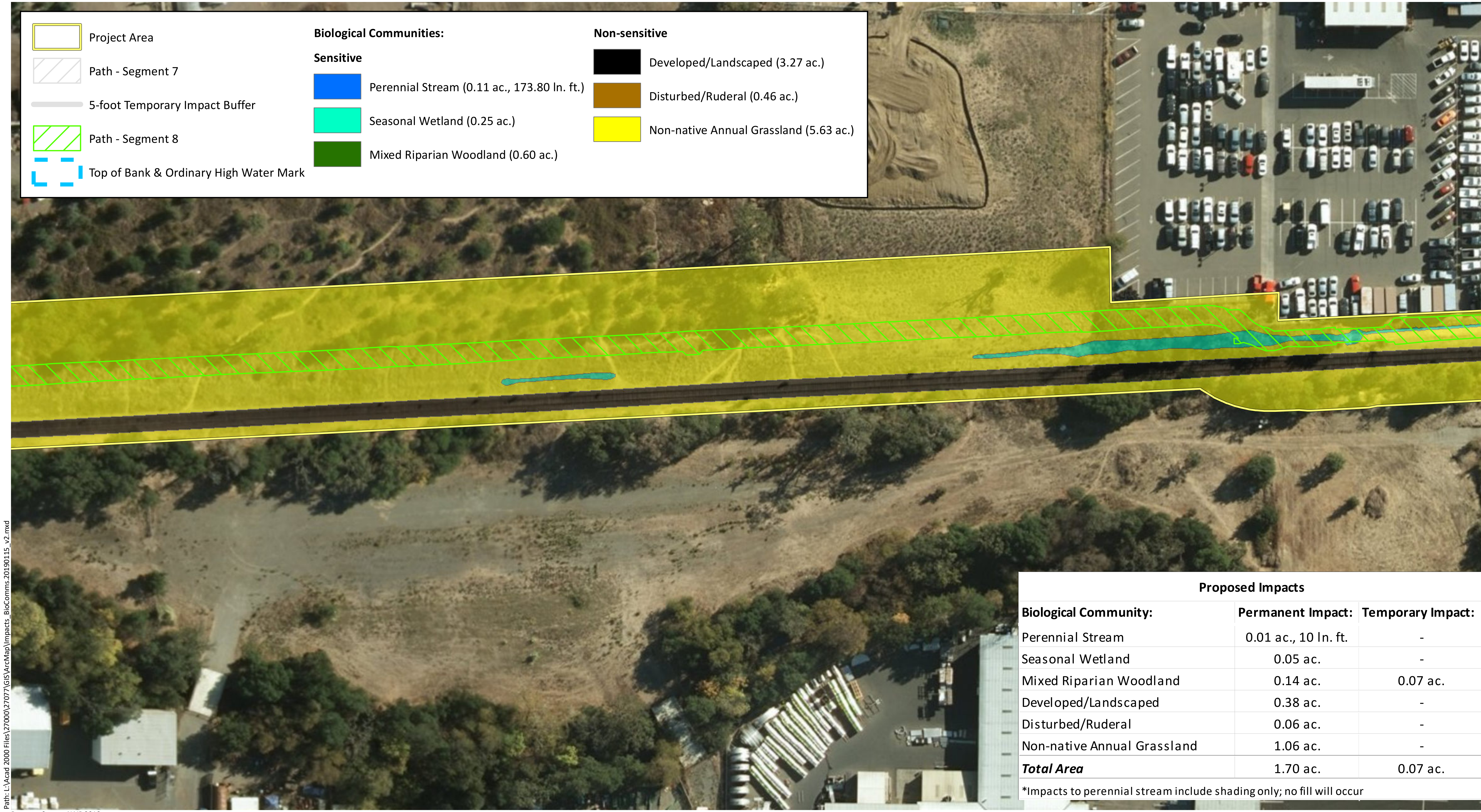
Figure 2. Proposed Impacts to Biological Communities in the Project Area

Coastland Healdsburg CEQA and Permitting
Healdsburg, Sonoma County, California

0 37.5 75 150
Feet

ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 1/15/2019
Map Prepared By: mweidenbach
Data Source(s): WRA



Proposed Impacts

Biological Community:	Permanent Impact:	Temporary Impact:
Perennial Stream	0.01 ac., 10 ln. ft.	-
Seasonal Wetland	0.05 ac.	-
Mixed Riparian Woodland	0.14 ac.	0.07 ac.
Developed/Landscaped	0.38 ac.	-
Disturbed/Ruderal	0.06 ac.	-
Non-native Annual Grassland	1.06 ac.	-
Total Area	1.70 ac.	0.07 ac.

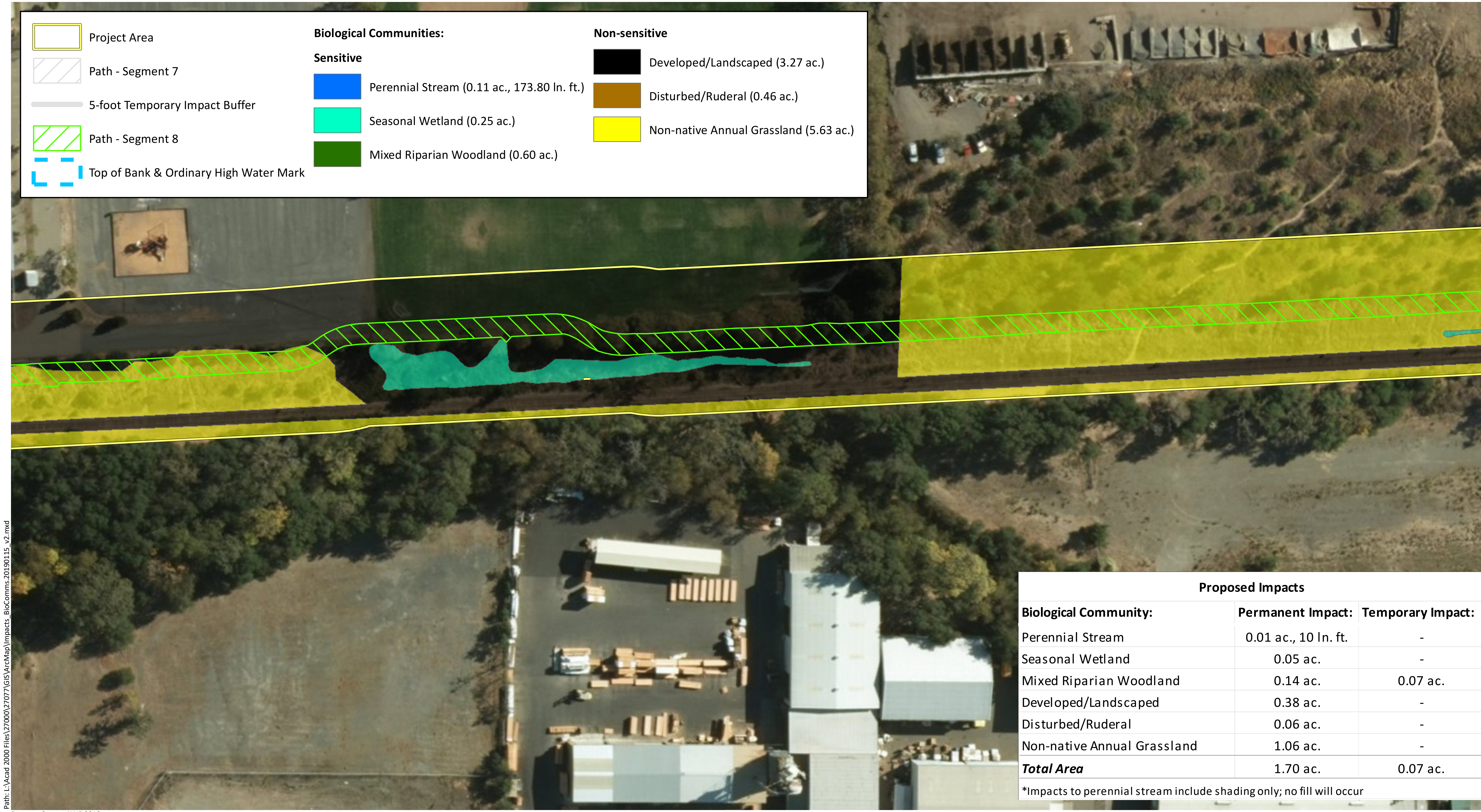
*Impacts to perennial stream include shading only; no fill will occur

Figure 2. Proposed Impacts to Biological Communities in the Project Area

Coastland Healdsburg CEQA and Permitting
Healdsburg, Sonoma County, California

ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 1/15/2019
Map Prepared By: mweidenbach
Data Source(s): WRA



Proposed Impacts

Biological Community:	Permanent Impact:	Temporary Impact:
Perennial Stream	0.01 ac., 10 ln. ft.	-
Seasonal Wetland	0.05 ac.	-
Mixed Riparian Woodland	0.14 ac.	0.07 ac.
Developed/Landscaped	0.38 ac.	-
Disturbed/Ruderal	0.06 ac.	-
Non-native Annual Grassland	1.06 ac.	-
Total Area	1.70 ac.	0.07 ac.

*Impacts to perennial stream include shading only; no fill will occur

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Impacts_BioComms.20190115_v2.mxd

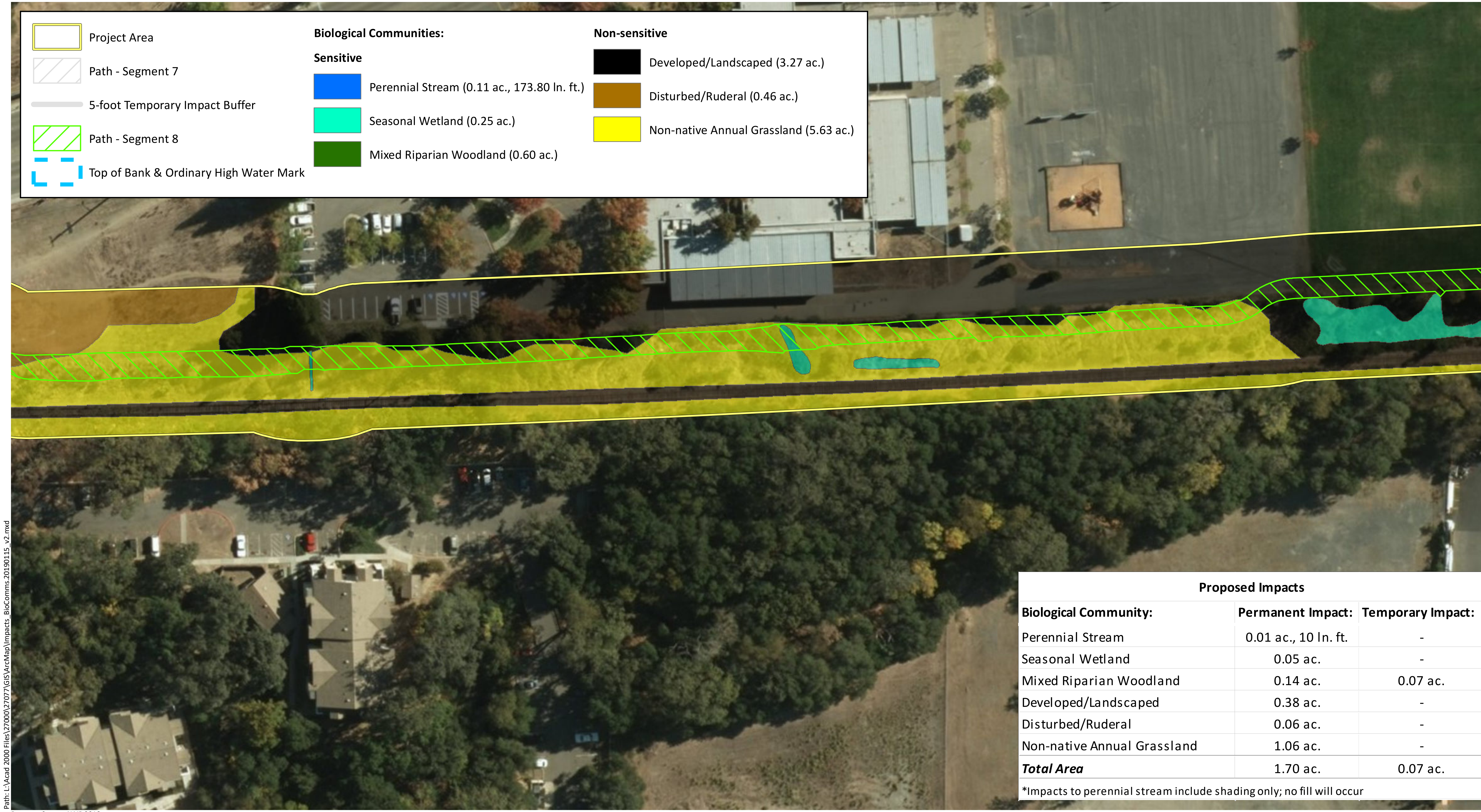
Basemap Source: NAIP 2016

Figure 2. Proposed Impacts to Biological Communities in the Project Area

Coastland Healdsburg CEQA and Permitting
Healdsburg, Sonoma County, California

wra
ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 1/15/2019
Map Prepared By: mweidenbach
Data Source(s): WRA



Proposed Impacts

Biological Community:	Permanent Impact:	Temporary Impact:
Perennial Stream	0.01 ac., 10 ln. ft.	-
Seasonal Wetland	0.05 ac.	-
Mixed Riparian Woodland	0.14 ac.	0.07 ac.
Developed/Landscaped	0.38 ac.	-
Disturbed/Ruderal	0.06 ac.	-
Non-native Annual Grassland	1.06 ac.	-
Total Area	1.70 ac.	0.07 ac.

*Impacts to perennial stream include shading only; no fill will occur

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Impacts_BioComms.20190115_v2.mxd

Basemap Source: NAIP 2016

Figure 2. Proposed Impacts to Biological Communities in the Project Area

Coastland Healdsburg CEQA and Permitting
Healdsburg, Sonoma County, California

0 37.5 75 150 Feet N

ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 1/15/2019
Map Prepared By: mweidenbach
Data Source(s): WRA

Proposed Impacts

Biological Community:	Permanent Impact:	Temporary Impact:
Perennial Stream	0.01 ac., 10 ln. ft.	-
Seasonal Wetland	0.05 ac.	-
Mixed Riparian Woodland	0.14 ac.	0.07 ac.
Developed/Landscaped	0.38 ac.	-
Disturbed/Ruderal	0.06 ac.	-
Non-native Annual Grassland	1.06 ac.	-
Total Area	1.70 ac.	0.07 ac.

*Impacts to perennial stream include shading only; no fill will occur

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Impacts_BioComms.20190115_v2.mxd

Basemap Source: NAIP 2016

Figure 2. Proposed Impacts to Biological Communities in the Project Area

Coastland Healdsburg CEQA and Permitting
Healdsburg, Sonoma County, California

ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 1/15/2019
Map Prepared By: mweidenbach
Data Source(s): WRA

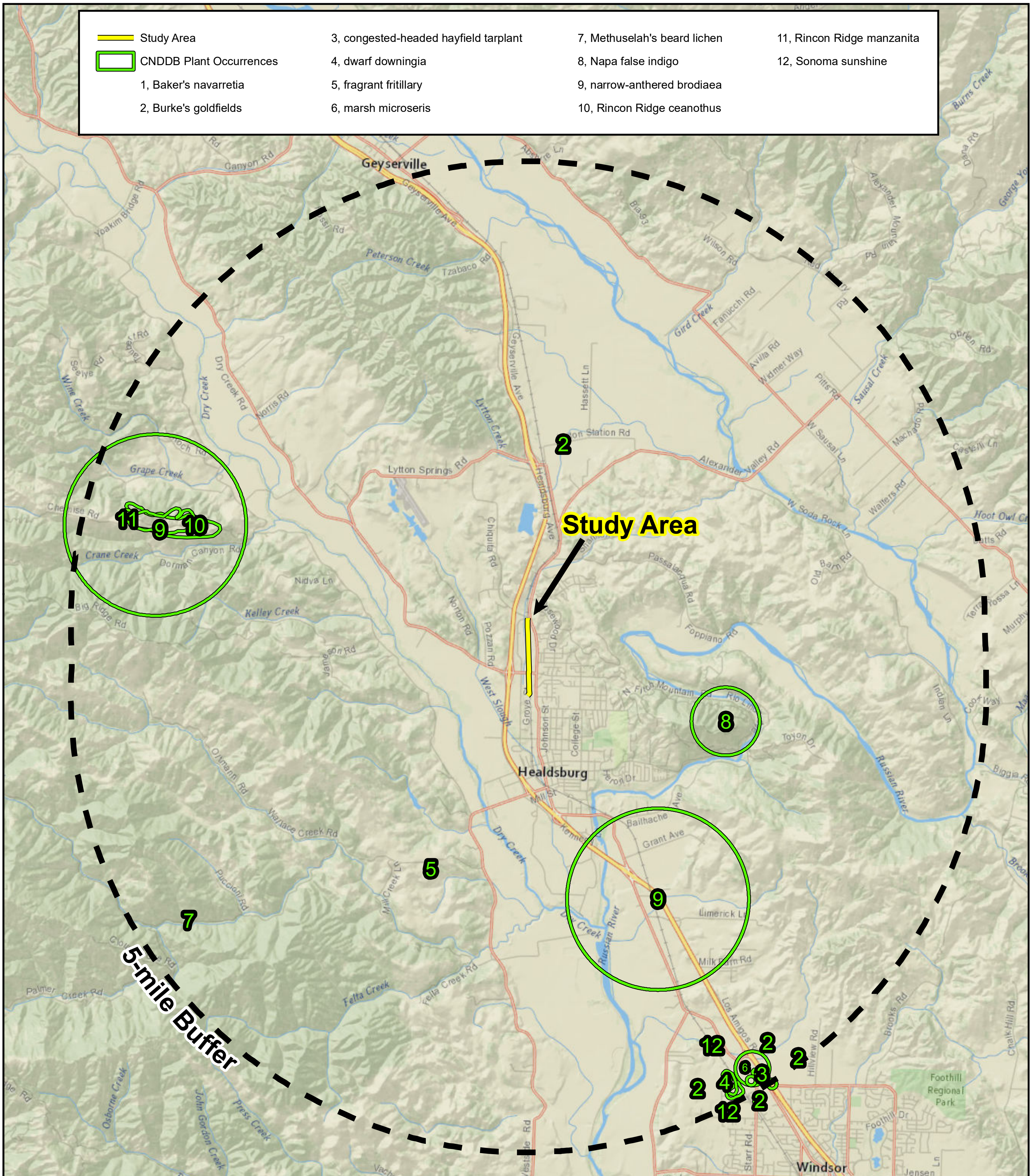


Figure 3. Special-status Plants Documented within 5 Miles of the Study Area

N W E S

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

0 0.5 1 2
Miles

WRA ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 6/9/2017
Map Prepared By: czumwalt
Base Source: National Geographic
Data Source(s): CNDDB May 2017

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\CNDDB Plants.mxd

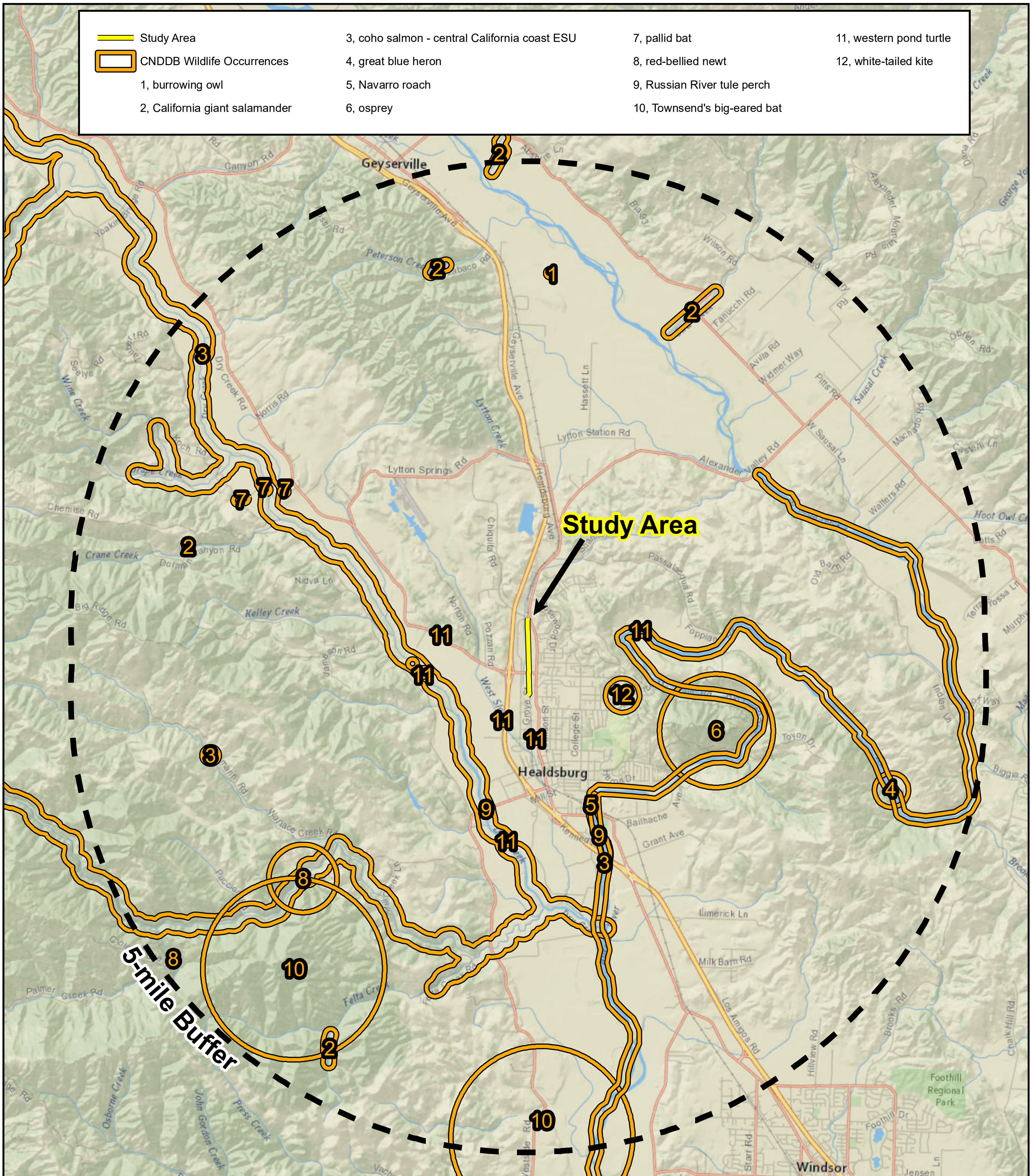


Figure 4. Special-status Wildlife Documented within 5 Miles of the Study Area

N
W E
S

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

0 0.5 1 2
Miles

ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 6/9/2017
Map Prepared By: czumwalt
Base Source: National Geographic
Data Source(s): CNDDB May 2017

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\CNDDB Wildlife.mxd

Attachment B -

List of Observed Plant Species

Attachment B – Plant and Wildlife Species Observed During the June 17, 2017, December 19, 2017, and February 5, 2018 Site Visits

Family	**Scientific name**	**Common name**	**Life form**	**Origin**	**Rare Status**[1]	**Invasive Status**[2]	**Wetland indicator**[3]
Adoxaceae	*Sambucus nigra* ssp. *caerulea*	Blue elderberry	native	shrub	-	-	FAC
Alliaceae	*Allium triquetrum*	White flowered onion	non-native (invasive)	perennial herb (bulb)	-	-	-
Anacardiaceae	*Toxicodendron diversilobum*	Poison oak	native	vine, shrub	-	-	FACU
Apiaceae	*Conium maculatum*	Poison hemlock	non-native (invasive)	perennial herb	-	Moderate	FACW
Apiaceae	*Daucus carota*	Carrot	non-native (invasive)	perennial herb	-	-	UPL
Apiaceae	*Foeniculum vulgare*	Fennel	non-native (invasive)	perennial herb	-	High	-
Apiaceae	*Torilis arvensis*	Field hedge parsley	non-native (invasive)	annual herb	-	Moderate	-
Apocynaceae	*Vinca major*	Vinca	non-native (invasive)	perennial herb	-	Moderate	-
Araliaceae	*Hedera helix*	English ivy	non-native (invasive)	vine, shrub	-	-	FACU
Asteraceae	*Baccharis pilularis* ssp. *consanguinea*	Coyote brush	native	shrub	-	-	-
Asteraceae	*Carduus pycnocephalus* ssp. *pycnocephalus*	Italian thistle	non-native (invasive)	annual herb	-	Moderate	-

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Asteraceae	*Centaurea solstitialis*	Yellow starthistle	non-native (invasive)	annual herb	-	High	-
Asteraceae	*Cichorium intybus*	Chicory	non-native	perennial herb	-	-	FACU
Asteraceae	*Cirsium vulgare*	Bullthistle	non-native (invasive)	perennial herb	-	Moderate	FACU
Asteraceae	*Dittrichia graveolens*	Stinkwort	non-native (invasive)	annual herb	-	Moderate	-
Asteraceae	*Helminthotheca echioides*	Bristly ox-tongue	non-native (invasive)	annual, perennial herb	-	Limited	FAC
Asteraceae	*Hypochaeris radicata*	Hairy cats ear	non-native (invasive)	perennial herb	-	Moderate	FACU
Asteraceae	*Lactuca serriola*	Prickly lettuce	non-native (invasive)	annual herb	-	-	FACU
Asteraceae	*Madia sativa*	Coastal tarweed	native	annual herb	-	-	-
Asteraceae	*Sonchus asper* ssp. *asper*	Sow thistle	non-native (invasive)	annual herb	-	-	FAC
Asteraceae	*Sonchus oleraceus*	Sow thistle	non-native	annual herb	-	-	UPL

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Asteraceae	*Tolpis barbata*	European milkwort	non-native	annual, perennial herb	-	-	-
Asteraceae	*Tragopogon porrifolius*	Salsify	non-native	perennial herb	-	-	-
Brassicaceae	*Hirschfeldia incana*	Mustard	non-native (invasive)	perennial herb	-	Moderate	-
Brassicaceae	*Raphanus sativus*	Wild radish	non-native (invasive)	annual, biennial herb	-	Limited	-
Caprifoliaceae	*Symphoricarpos albus* var. *laevigatus*	Snowberry	native	shrub	-	-	FACU
Caryophyllaceae	*Spergularia rubra*	Purple sand spurry	non-native	annual, perennial herb	-	-	FAC
Chenopodiaceae	*Atriplex prostrata*	Fat-hen	non-native	annual herb	-	-	FACW
Convolvulaceae	*Convolvulus arvensis*	Field bindweed	non-native (invasive)	perennial herb, vine	-	-	-
Cupressaceae	*Sequoia sempervirens*	Coast redwood	native	tree	-	-	-
Cyperaceae	*Carex* cf. *tumulicola*	Split awn sedge	native	perennial grasslike herb	-	-	FACU

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Cyperaceae	*Cyperus eragrostis*	Tall flat sedge	native	perennial grasslike herb	-	-	FACW
Dipsacaceae	*Dipsacus sativus*	Indian teasel	non-native (invasive)	biennial herb	-	Moderate	-
Fabaceae	*Acmispon americanus* var. *americanus*	Spanish lotus	native	annual herb	-	-	UPL
Fabaceae	*Genista monspessulana*	French broom	non-native (invasive)	shrub	-	High	-
Fabaceae	*Lotus corniculatus*	Bird's foot trefoil	non-native (invasive)	perennial herb	-	-	FAC
Fabaceae	*Medicago polymorpha*	California burclover	non-native (invasive)	annual herb	-	Limited	FACU
Fabaceae	*Trifolium angustifolium*	Narrow leaved clover	non-native	annual herb	-	-	-
Fabaceae	*Trifolium hirtum*	Rose clover	non-native (invasive)	annual herb	-	Limited	-
Fabaceae	*Vicia benghalensis*	Purple vetch	non-native	annual herb, vine	-	-	-
Fabaceae	*Vicia villosa*	Hairy vetch	non-native (invasive)	annual herb, vine	-	-	-

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Fagaceae	*Quercus agrifolia* var. *agrifolia*	Coast live oak	native	tree	-	-	-
Fagaceae	*Quercus lobata*	Valley oak	native	tree	-	-	FACU
Gentianaceae	*Centaurium tenuiflorum*	Slender centaury	non-native	annual herb	-	-	FACW
Geraniaceae	*Erodium botrys*	Big heron bill	non-native (invasive)	annual herb	-	-	FACU
Geraniaceae	*Geranium dissectum*	Wild geranium	non-native (invasive)	annual herb	-	Limited	-
Hypericaceae	*Hypericum perforatum* ssp. *perforatum*	Klamathweed	non-native	perennial herb	-	-	FACU
Juglandaceae	*Juglans hindsii*	Northern California black walnut	native	tree	Rank 1B.1*	-	FAC
Juncaceae	*Juncus bufonius*	Common toad rush	native	annual grasslike herb	-	-	FACW
Juncaceae	*Juncus patens*	Rush	native	perennial grasslike herb	-	-	FACW
Lamiaceae	*Mentha* sp.	-	-	-	-	-	-
Linaceae	*Linum bienne*	Flax	non-native	annual herb	-	-	-

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Moraceae	*Ficus carica*	Common fig	non-native (invasive)	tree	-	Moderate	FACU
Myrsinaceae	*Lysimachia arvensis*	Scarlet pimpernel	non-native	annual herb	-	-	FAC
Oleaceae	*Fraxinus latifolia*	Oregon ash	native	tree	-	-	FACW
Oleaceae	*Ligustrum* sp.	-	-	-	-	-	-
Onagraceae	*Epilobium brachycarpum*	Willow herb	native	annual herb	-	-	-
Onagraceae	*Epilobium ciliatum*	Slender willow herb	native	perennial herb	-	-	FACW
Onagraceae	*Epilobium* cf. *torreyi*	Narrow boisduvalia	native	annual herb	-	-	FACW
Orobanchaceae	*Parentucellia viscosa*	Yellow parentucellia	non-native (invasive)	annual herb	-	Limited	FAC
Papaveraceae	*Eschscholzia californica*	California poppy	native	annual, perennial herb	-	-	-
Plantaginaceae	*Kickxia spuria*	Fluellin	non-native	perennial herb	-	-	-
Plantaginaceae	*Plantago coronopus*	Cut leaf plantain	non-native (invasive)	annual herb	-	-	FAC

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Plantaginaceae	*Plantago lanceolata*	English plantain	non-native (invasive)	perennial herb	-	Limited	FAC
Platanaceae	*Platanus × acerifolia*	London plane	non-native	tree	-	-	-
Poaceae	*Avena barbata*	Slim oat	non-native (invasive)	annual, perennial grass	-	Moderate	-
Poaceae	*Briza maxima*	Rattlesnake grass	non-native (invasive)	annual grass	-	Limited	-
Poaceae	*Briza minor*	Little rattlesnake grass	non-native	annual grass	-	-	FAC
Poaceae	*Bromus diandrus*	Ripgut brome	non-native (invasive)	annual grass	-	Moderate	-
Poaceae	*Bromus hordeaceus*	Soft chess	non-native (invasive)	annual grass	-	Limited	FACU
Poaceae	*Cynodon dactylon*	Bermuda grass	non-native (invasive)	perennial grass	-	Moderate	FACU
Poaceae	*Cynosurus echinatus*	Dogtail grass	non-native (invasive)	annual grass	-	Moderate	-
Poaceae	*Elymus glaucus*	Blue wildrye	native	perennial grass	-	-	FACU

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Poaceae	*Festuca myuros*	Rattail sixweeks grass	non-native (invasive)	annual grass	-	-	FACU
Poaceae	*Festuca perennis*	Italian rye grass	non-native	annual, perennial grass	-	-	FAC
Poaceae	*Holcus lanatus*	Common velvetgrass	non-native (invasive)	perennial grass	-	Moderate	FAC
Poaceae	*Hordeum marinum* ssp. *gussoneanum*	Mediterranean barley	non-native (invasive)	annual grass	-	Moderate	FAC
Poaceae	*Hordeum murinum*	Foxtail barley	non-native (invasive)	annual grass	-	Moderate	FACU
Poaceae	*Paspalum dilatatum*	Dallis grass	non-native	perennial grass	-	-	FAC
Poaceae	*Phalaris aquatica*	Harding grass	non-native (invasive)	perennial grass	-	Moderate	FACU
Poaceae	*Phalaris minor*	Mediterranean canarygrass	non-native	annual grass	-	-	-
Poaceae	*Poa annua*	Annual blue grass	non-native	annual grass	-	-	FAC
Poaceae	*Polypogon interruptus*	Ditch beard grass	non-native	perennial grass	-	-	FACW

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Poaceae	*Polypogon monspeliensis*	Annual beard grass	non-native (invasive)	annual grass	-	Limited	FACW
Poaceae	*Polypogon viridis*	Water beard grass	non-native	perennial grass	-	-	FACW
Polygonaceae	*Persicaria* sp.	-	-	-	-	-	-
Polygonaceae	*Polygonum aviculare*	Prostrate knotweed	non-native	annual, perennial herb	-	-	FAC
Polygonaceae	*Rumex acetosella*	Sheep sorrel	non-native (invasive)	perennial herb	-	Moderate	FACU
Polygonaceae	*Rumex crispus*	Curly dock	non-native (invasive)	perennial herb	-	Limited	FAC
Polygonaceae	*Rumex pulcher*	Fiddleleaf dock	non-native	perennial herb	-	-	FAC
Rosaceae	*Heteromeles arbutifolia*	Toyon	native	shrub	-	-	-
Rosaceae	*Prunus cerasifera*	Cherry plum	non-native (invasive)	tree	-	Limited	-
Rosaceae	*Pyrus calleryana*	Callery pear	non-native	tree	-	-	-
Rosaceae	*Rosa* sp.	Rose	-	-	-	-	-

Family	Scientific name	Common name	Life form	Origin	Rare Status[1]	Invasive Status[2]	Wetland indicator[3]
Rosaceae	*Rubus armeniacus*	Himalayan blackberry	non-native (invasive)	shrub	-	High	FAC
Rosaceae	*Rubus ursinus*	California blackberry	native	vine, shrub	-	-	FAC
Rubiaceae	*Galium aparine*	Cleavers	native	annual herb	-	-	FACU
Salicaceae	*Populus fremontii* ssp. *fremontii*	Cottonwood	native	tree	-	-	FAC
Salicaceae	*Salix laevigata*	Red willow	native	tree	-	-	FACW
Salicaceae	*Salix lasiolepis*	Arroyo willow	native	tree, shrub	-	-	FACW
Vitaceae	*Parthenocissus inserta*	Woodbine	native	vine, shrub	-	-	FACU
Vitaceae	*Vitis californica*	California wild grape	native	vine, shrub	-	-	FACU

Wildlife	
Common Name	**Scientific Name**
acorn woodpecker	*Melanerpes formicivorus*
American crow	*Corvus brachyrhynchos*
barn swallow	*Hirundo rustica*
California scrub-jay	*Aphelocoma californica*
California towhee	*Melozone crissalis*

chestnut-backed chickadee	*Poecile rufescens*
dark-eyed junco	*Junco hyemalis*
mourning dove	*Zenaida macroura*
northern flicker	*Colaptes auratus*
turkey vulture	*Cathartes aura*
tree frog	*Pseudacris regilla*

*Rarity status only applies to native stands of the species which are not present in the Study Area (CDFW 2018). This species has been widely planted outside of its native range, and is naturalized within the Study Area.

All species identified using the *Jepson Manual, 2nd Edition* (Baldwin et al. 2012), *A Flora of Sonoma County* (Best et al. 1996), and *The Jepson Flora Project* (Jepson eFlora 2018); nomenclature follows *The Jepson Flora Project* (Jepson eFlora 2018) unless otherwise noted

Sp.: "species", intended to indicate that the observer was confident in the identity of the genus but uncertain which species
Cf.: intended to indicate a species appeared to the observer to be specific, but was not identified based on diagnostic characters

[1]Rare Status: The CNPS Inventory of Rare and Endangered Plants (CNPS 2018)

- FE: Federal Endangered
- FT: Federal Threatened
- SE: State Endangered
- ST: State Threatened
- SR: State Rare
- Rank 1A: Plants presumed extirpated in California and either rare or extinct elsewhere
- Rank 1B: Plants rare, threatened, or endangered in California and elsewhere
- Rank 2A: Plants presumed extirpated in California, but more common elsewhere
- Rank 2B: Plants rare, threatened, or endangered in California, but more common elsewhere
- Rank 3: Plants about which we need more information – a review list
- Rank 4: Plants of limited distribution – a watch list

[2]Invasive Status: California Invasive Plant Inventory (Cal-IPC 2018)

- High: Severe ecological impacts; high rates of dispersal and establishment; most are widely distributed ecologically.
- Moderate: Substantial and apparent ecological impacts; moderate-high rates of dispersal, establishment dependent on disturbance;

limited- moderate distribution ecologically
Limited: Minor or not well documented ecological impacts; low-moderate rate of invasiveness; limited distribution ecologically
Assessed: Assessed by Cal-IPC and determined to not be an existing current threat

[3]Wetland Status: National List of Plant Species that Occur in Wetlands, Arid West Region (Lichvar et al. 2016)

OBL: Almost always a hydrophyte, rarely in uplands
FACW: Usually a hydrophyte, but occasionally found in uplands
FAC: Commonly either a hydrophyte or non-hydrophyte
FACU: Occasionally a hydrophyte, but usually found in uplands
UPL: Rarely a hydrophyte, almost always in uplands
NL: Rarely a hydrophyte, almost always in uplands
NI: No information; not factored during wetland delineation

Attachment C-

Database Search Results

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Jimtown (3812267) OR Healdsburg (3812257) OR Guerneville (3812258) OR Geyserville (3812268))
 AND Taxonomic Group IS (Ferns OR Gymnosperms OR Monocots OR Dicots OR Lichens OR Bryophytes)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Amorpha californica var. napensis Napa false indigo	PDFAB08012	None	None	G4T2	S2	1B.2
Arctostaphylos bakeri ssp. sublaevis The Cedars manzanita	PDERI04222	None	Rare	G2T2	S2	1B.2
Arctostaphylos stanfordiana ssp. decumbens Rincon Ridge manzanita	PDERI041G4	None	None	G3T1	S1	1B.1
Blennosperma bakeri Sonoma sunshine	PDAST1A010	Endangered	Endangered	G1	S1	1B.1
Brodiaea leptandra narrow-anthered brodiaea	PMLIL0C022	None	None	G3?	S3?	1B.2
Calochortus raichei The Cedars fairy-lantern	PMLIL0D1L0	None	None	G2	S2	1B.2
Calystegia collina ssp. oxyphylla Mt. Saint Helena morning-glory	PDCON04032	None	None	G4T3	S3	4.2
Carex comosa bristly sedge	PMCYP032Y0	None	None	G5	S2	2B.1
Ceanothus confusus Rincon Ridge ceanothus	PDRHA04220	None	None	G1	S1	1B.1
Ceanothus purpureus holly-leaved ceanothus	PDRHA04160	None	None	G2	S2	1B.2
Centromadia parryi ssp. parryi pappose tarplant	PDAST4R0P2	None	None	G3T2	S2	1B.2
Cordylanthus tenuis ssp. capillaris Pennell's bird's-beak	PDSCR0J0S2	Endangered	Rare	G4G5T1	S1	1B.2
Cryptantha dissita serpentine cryptantha	PDBOR0A0H2	None	None	G2	S2	1B.2
Downingia pusilla dwarf downingia	PDCAM060C0	None	None	GU	S2	2B.2
Erigeron serpentinus serpentine daisy	PDAST3M5M0	None	None	G2	S2	1B.3
Fritillaria liliacea fragrant fritillary	PMLIL0V0C0	None	None	G2	S2	1B.2
Hemizonia congesta ssp. congesta congested-headed hayfield tarplant	PDAST4R065	None	None	G5T1T2	S1S2	1B.2
Horkelia tenuiloba thin-lobed horkelia	PDROS0W0E0	None	None	G2	S2	1B.2

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Kopsiopsis hookeri small groundcone	PDORO01010	None	None	G4?	S1S2	2B.3
Lasthenia burkei Burke's goldfields	PDAST5L010	Endangered	Endangered	G1	S1	1B.1
Leptosiphon jepsonii Jepson's leptosiphon	PDPLM09140	None	None	G3	S3	1B.2
Limnanthes vinculans Sebastopol meadowfoam	PDLIM02090	Endangered	Endangered	G1	S1	1B.1
Microseris paludosa marsh microseris	PDAST6E0D0	None	None	G2	S2	1B.2
Navarretia leucocephala ssp. bakeri Baker's navarretia	PDPLM0C0E1	None	None	G4T2	S2	1B.1
Navarretia leucocephala ssp. plieantha many-flowered navarretia	PDPLM0C0E5	Endangered	Endangered	G4T1	S1	1B.2
Streptanthus brachiatus ssp. hoffmanii Freed's jewelflower	PDBRA2G071	None	None	G2T2	S2	1B.2
Usnea longissima Methuselah's beard lichen	NLLEC5P420	None	None	G4	S4	4.2

Record Count: 27

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Jimtown (3812267) OR Healdsburg (3812257) OR Guerneville (3812258) OR Geyserville (3812268))
 AND Taxonomic Group IS (Fish OR Amphibians OR Reptiles OR Birds OR Mammals OR Mollusks OR Arachnids OR Crustaceans OR Insects)

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Arborimus pomo Sonoma tree vole	AMAFF23030	None	None	G3	S3	SSC
Ardea herodias great blue heron	ABNGA04010	None	None	G5	S4	
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Corynorhinus townsendii Townsend's big-eared bat	AMACC08010	None	None	G3G4	S2	SSC
Dicamptodon ensatus California giant salamander	AAAAH01020	None	None	G3	S2S3	SSC
Dubiraphia giulianii Giuliani's dubiraphian riffle beetle	IICOL5A020	None	None	G1G3	S1S3	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Emys marmorata western pond turtle	ARAAD02030	None	None	G3G4	S3	SSC
Erethizon dorsatum North American porcupine	AMAFJ01010	None	None	G5	S3	
Hysterocarpus traski pomo Russian River tule perch	AFCQK02011	None	None	G5T4	S4	SSC
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Lavinia symmetricus navarroensis Navarro roach	AFCJB19023	None	None	G4T1T2	S2S3	SSC
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Mylopharodon conocephalus hardhead	AFCJB25010	None	None	G3	S3	SSC
Oncorhynchus kisutch pop. 4 coho salmon - central California coast ESU	AFCHA02034	Endangered	Endangered	G4	S2?	
Oncorhynchus mykiss irideus pop. 8 steelhead - central California coast DPS	AFCHA0209G	Threatened	None	G5T2T3Q	S2S3	

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Pandion haliaetus osprey	ABNKC01010	None	None	G5	S4	WL
Rana boylii foothill yellow-legged frog	AAABH01050	None	Candidate Threatened	G3	S3	SSC
Rana draytonii California red-legged frog	AAABH01022	Threatened	None	G2G3	S2S3	SSC
Taricha rivularis red-bellied newt	AAAAF02020	None	None	G4	S2	SSC

Record Count: 22

CNPS California Native Plant Society

Plant List

Inventory of Rare and Endangered Plants

39 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3812257, 3812267 3812268 and 3812258;

Modify Search Criteria Export to Excel Modify Columns Modify Sort Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Amorpha californica var. napensis	Napa false indigo	Fabaceae	perennial deciduous shrub	Apr-Jul	1B.2	S2	G4T2
Arctostaphylos bakeri ssp. bakeri	Baker's manzanita	Ericaceae	perennial evergreen shrub	Feb-Apr	1B.1	S1	G2T1
Arctostaphylos bakeri ssp. sublaevis	The Cedars manzanita	Ericaceae	perennial evergreen shrub	Feb,Apr,May	1B.2	S2	G2T2
Arctostaphylos stanfordiana ssp. decumbens	Rincon Ridge manzanita	Ericaceae	perennial evergreen shrub	Feb-Apr(May)	1B.1	S1	G3T1
Asclepias solanoana	serpentine milkweed	Apocynaceae	perennial herb	May-Jul(Aug)	4.2	S3	G3
Astragalus breweri	Brewer's milk-vetch	Fabaceae	annual herb	Apr-Jun	4.2	S3	G3
Blennosperma bakeri	Sonoma sunshine	Asteraceae	annual herb	Mar-May	1B.1	S1	G1
Brodiaea leptandra	narrow-anthered brodiaea	Themidaceae	perennial bulbiferous herb	May-Jul	1B.2	S3?	G3?
Calochortus raichei	The Cedars fairy-lantern	Liliaceae	perennial bulbiferous herb	May-Aug	1B.2	S2	G2
Calystegia collina ssp. oxyphylla	Mt. Saint Helena morning-glory	Convolvulaceae	perennial rhizomatous herb	Apr-Jun	4.2	S3	G4T3
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	2B.1	S2	G5
Castilleja ambigua var. ambigua	johnny-nip	Orobanchaceae	annual herb (hemiparasitic)	Mar-Aug	4.2	S4	G4T5
Ceanothus confusus	Rincon Ridge ceanothus	Rhamnaceae	perennial evergreen shrub	Feb-Jun	1B.1	S1	G1
Ceanothus purpureus	holly-leaved ceanothus	Rhamnaceae	perennial evergreen shrub	Feb-Jun	1B.2	S2	G2
Centromadia parryi ssp. parryi	pappose tarplant	Asteraceae	annual herb	May-Nov	1B.2	S2	G3T2
Cordylanthus tenuis ssp. brunneus	serpentine bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jul-Aug	4.3	S3	G4G5T3
Cordylanthus tenuis ssp. capillaris	Pennell's bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Sep	1B.2	S1	G4G5T1
Cryptantha dissita	serpentine cryptantha	Boraginaceae	annual herb	Apr-Jun	1B.2	S2	G2

Cypripedium montanum	mountain lady's-slipper	Orchidaceae	perennial rhizomatous herb	Mar-Aug	4.2	S4	G4
Downingia pusilla	dwarf downingia	Campanulaceae	annual herb	Mar-May	2B.2	S2	GU
Erigeron serpentinus	serpentine daisy	Asteraceae	perennial herb	May-Aug	1B.3	S2	G2
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	1B.2	S2	G2
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Asteraceae	annual herb	Apr-Nov	1B.2	S1S2	G5T1T2
Hesperevax caulescens	hogwallow starfish	Asteraceae	annual herb	Mar-Jun	4.2	S3	G3
Horkelia tenuiloba	thin-lobed horkelia	Rosaceae	perennial herb	May-Jul(Aug)	1B.2	S2	G2
Kopsiopsis hookeri	small groundcone	Orobanchaceae	perennial rhizomatous herb (parasitic)	Apr-Aug	2B.3	S1S2	G4?
Lasthenia burkei	Burke's goldfields	Asteraceae	annual herb	Apr-Jun	1B.1	S1	G1
Leptosiphon jepsonii	Jepson's leptosiphon	Polemoniaceae	annual herb	Mar-May	1B.2	S3	G3
Lessingia arachnoidea	Crystal Springs lessingia	Asteraceae	annual herb	Jul-Oct	1B.2	S2	G2
Limnanthes vinculans	Sebastopol meadowfoam	Limnanthaceae	annual herb	Apr-May	1B.1	S1	G1
Micropus amphibolus	Mt. Diablo cottonweed	Asteraceae	annual herb	Mar-May	3.2	S3S4	G3G4
Microseris paludosa	marsh microseris	Asteraceae	perennial herb	Apr-Jun(Jul)	1B.2	S2	G2
Monardella viridis	green monardella	Lamiaceae	perennial rhizomatous herb	Jun-Sep	4.3	S4	G4
Navarretia leucocephala ssp. bakeri	Baker's navarretia	Polemoniaceae	annual herb	Apr-Jul	1B.1	S2	G4T2
Navarretia leucocephala ssp. plieantha	many-flowered navarretia	Polemoniaceae	annual herb	May-Jun	1B.2	S1	G4T1
Perideridia gairdneri ssp. gairdneri	Gairdner's yampah	Apiaceae	perennial herb	Jun-Oct	4.2	S4	G5T4
Ranunculus lobbii	Lobb's aquatic buttercup	Ranunculaceae	annual herb (aquatic)	Feb-May	4.2	S3	G4
Streptanthus brachiatus ssp. hoffmanii	Freed's jewelflower	Brassicaceae	perennial herb	May-Jul	1B.2	S2	G2T2
Usnea longissima	Methuselah's beard lichen	Parmeliaceae	fruticose lichen (epiphytic)		4.2	S4	G4

Suggested Citation

California Native Plant Society, Rare Plant Program. 2018. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 02 March 2018].

Questions and Comments

rareplants@cnps.org

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: March 07, 2018
Consultation Code: 08ESMF00-2018-SLI-1447
Event Code: 08ESMF00-2018-E-04184
Project Name: Foss Creek Pathway Segments 7 and 8

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2018-SLI-1447

Event Code: 08ESMF00-2018-E-04184

Project Name: Foss Creek Pathway Segments 7 and 8

Project Type: TRANSPORTATION

Project Description: Public trail.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.628940427723194N122.87428029406226W

Counties: Sonoma, CA

Endangered Species Act Species

There is a total of 10 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (CA - Sonoma County) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Endangered

Crustaceans

NAME	STATUS
California Freshwater Shrimp *Syncaris pacifica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7903	Endangered

Flowering Plants

NAME	STATUS
Burke's Goldfields *Lasthenia burkei* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4338	Endangered
Many-flowered Navarretia *Navarretia leucocephala ssp. plieantha* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2491	Endangered
Pennell's Bird's-beak *Cordylanthus tenuis ssp. capillaris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3175	Endangered
Sebastopol Meadowfoam *Limnanthes vinculans* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/404	Endangered
Sonoma Sunshine *Blennosperma bakeri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1260	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Attachment D -

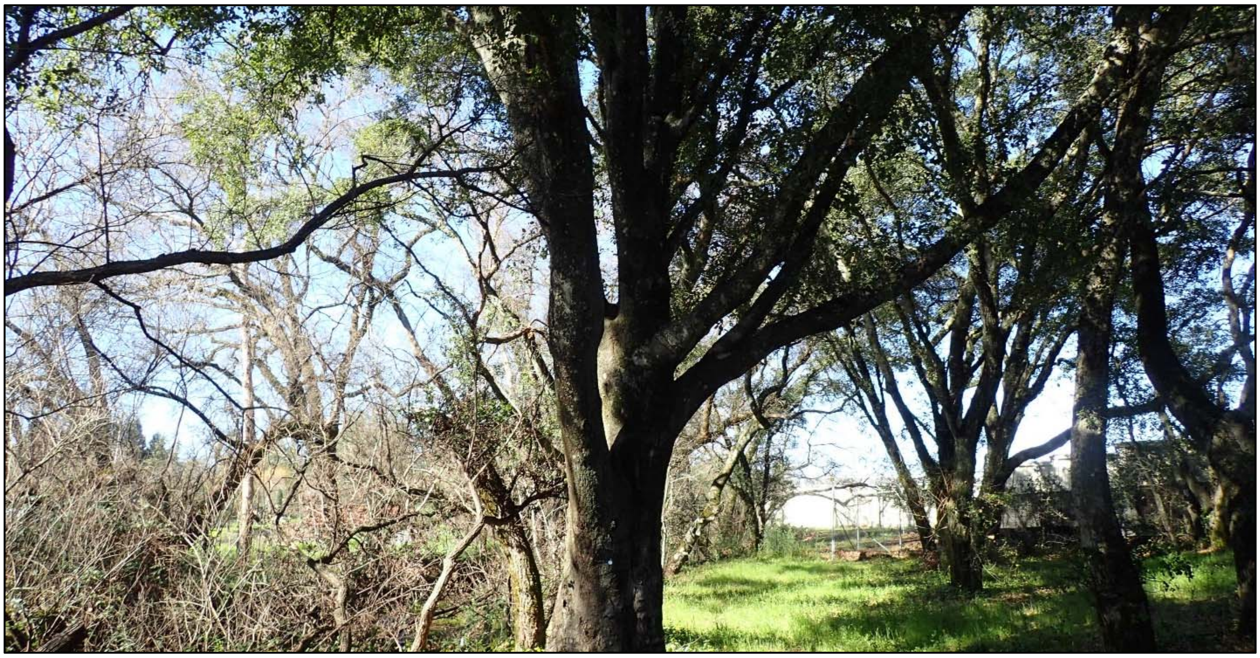
Representative Photographs

Photograph 1. Photograph depicting a typical seasonal wetland in the Study Area, dominated by curly dock (*Rumex crispus*), and tall flat sedge (*Cyperus eragrostis*).

Photograph 2. Photograph depicting perennial stream (Foss Creek) and mixed riparian woodland within the Study Area.

Photograph 3. Photograph depicting disturbed area at right and non-native grassland at center dominated by ruderal grasses and forbs including slim oat (*Avena barbata*), and fennel (*Foeniculum vulgare*).

Photograph 4. Photograph depicting non-native grassland at center, and developed area (i.e. railroad tracks) at right.



Photograph 5. Photograph depicting a large, coast live oak (*Quercus agrifolia*) heritage tree within the mixed riparian woodland community.

Photograph 6. Photograph depicting developed/landscaped area with planted coast redwood (*Sequoia sempervirens*) trees.

Attachment E -

Wetland Determination Data Forms

Wetland Determination Data Form - Arid West Region

Project/Site: Foss Creek Pathway | City: Healdsburg | County: Sonoma | Sampling Date: 6/17/2017

Applicant/Owner: City of Healdsburg | State: CA | Sampling Point: **SP01**

Investigator(s): Kate Allan, Scott Batiuk | Section,Township,Range: Land Grant - Sotoyome

Landform (hillslope, terrace, etc.): fill terrace | Local Relief (concave, convex, none): concave | Slope(%): 1

Subregion(LRR): California | Lat: 38.63029821 | Long: -122.8743937 | Datum: WGS 84

Soil Map Unit Name: Zamora silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes ☐ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☐ Yes ☒ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: Upland sample point located in a shallow, linear depression in a vacant area adjacent to railroad tracks in the central portion of the site. The sil is compact gravelly fill. Although the sample point meets hydrophytic vegetation indicators, it does not meet hydric soil and wetland hydrology indicators and is therefore not a wetland.

VEGETATION (use scientific names)

	Absolute % cover	Dominant Species?	Indicator Status
TREE STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Festuca perennis*	25	yes	FAC
2. *Bromus hordeaceus*	15	yes	FACU
3. *Hordeum marinum*	15	yes	FAC
4. *Paspalum dilatatum*	10	no	FAC
5. *Hypochaeris radicata*	5	no	FACU
6. *Lotus corniculatus*	5	no	FAC
7. *Plantago lanceolata*	5	no	FAC
8. *Helminthotheca echioides*	3	no	FAC
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 15 | % cover of biotic crust: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	2	(A)
Total number of dominant species across all strata?	3	(B)
% of dominant species that are OBL, FACW, or FAC?	67	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: Additional cover: Cyperus eragrostis, 2%, no, FACW.
The sample point meets the Dominance Test hydropytic vegetation indicator.

SOIL

Sampling Point SP01

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 3/2	100					gravelly sandy	
4-10	10YR 4/3	100	7.5YR 3/4	<1	C	M	sandy clay loam	
10-14	10YR 4/3	60	7.5YR 4/6	1	C	M	sandy clay loam	
	10YR 4/2	40					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: The profile is comprised of compact fill soil, approximately 25% is larger chunks of rock and asphalt.
The sample point does not meet hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	☐ Yes	☒ No	Depth (inches):
Water table present?	☐ Yes	☒ No	Depth (inches):
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not meet wetland hydrology indicators.

Wetland Determination Data Form - Arid West Region

Project/Site: Foss Creek Pathway | City: Healdsburg | County: Sonoma | Sampling Date: 6/17/2017

Applicant/Owner: City of Healdsburg | State: CA | Sampling Point: **SP02**

Investigator(s): Kate Allan, Scott Batiuk | Section,Township,Range: Land Grant - Sotoyome

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): concave | Slope(%): 1

Subregion(LRR): California | Lat: 38.62307454 | Long: -122.874004 | Datum: WGS 84

Soil Map Unit Name: Zamora silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Hydric Soil Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland sample point located in a shallow, linear, manmade ditch situated between railroad tracks and Foss Creek in the southern portion of the site. South of the sample point, the ditch broadens out into a swale that drains into Foss Creek. Vegetation partially mowed. The sample point samples wetland feature w01. SP02 and SP03 are paired.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: 5' radius			
1. *Toxicodendron diversilobum*	5	no	FACU
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:	5		
HERB STRATUM Plot Size: 5' radius			
1. *Festuca perennis*	60	yes	FAC
2. *Cyperus eragrostis*	15	no	FACW
3. *Rumex crispus*	3	no	FAC
4. *Polypogon monspeliensis*	2	no	FACW
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	80		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 15 | % cover of biotic crust: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	1	(A)
Total number of dominant species across all strata?	2	(B)
% of dominant species that are OBL, FACW, or FAC?	50	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species	0	x1	0
FACW species	17	x2	34
FAC species	63	x3	189
FACU species	5	x4	20
UPL species	0	x5	0
Column Totals	85 (A)		243 (B)

Prevalence Index = B/A = 2.85

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☒ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: The sample point meets the Prevalence Index hydropytic vegetation indicator.

SOIL

Sampling Point SP02

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
0-2	10YR 3/2	70	7.5YR 4/6	3	C	M	clay loam	
	10YR 4/1	27						
2-12	10YR 3/2	30	7.5YR 4/6	15	C	M	clay loam	
	10YR 4/1	55						

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☒ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________________

Depth (inches): ____________________

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point meets the Depleted Matrix and Redox Dark Surface hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): ____________

Water table present? ☐ Yes ☒ No Depth (inches): ____________

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): ____________

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point meets the water-stained leaves wetland hydrology indicator.

Wetland Determination Data Form - Arid West Region

Project/Site Foss Creek Pathway City Healdsburg County Sonoma Sampling Date 6/17/2017

Applicant/Owner City of Healdsburg State CA Sampling Point **SP03**

Investigator(s) Kate Allan, Scott Batiuk Section,Township,Range Land Grant - Sotoyome

Landform (hillslope, terrace, etc.) terrace Local Relief (concave, convex, none) convex Slope(%) 3

Subregion(LRR) California Lat: 38.62308244 Long: -122.8740391 Datum: WGS 84

Soil Map Unit Name Zamora silty clay loam, 0 to 2 percent slopes NWI classification N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☐ Yes ☒ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: Upland sample point located in oak riparian canopy adjacent to a shallow, linear, manmade ditch situated between railroad tracks and Foss Creek in the southern portion of the site. Vegetation partially mowed. SP02 and SP03 are paired.

VEGETATION (use scientific names)

TREE STRATUM **Plot Size:** 20' x 40'	Absolute % cover	Dominant Species?	Indicator Status
1. *Quercus agrifolia*	70	yes	NL
2.			
3.			
4.			
Tree Stratum Total Cover:	70		
SAPLING/SHRUB STRATUM **Plot Size:** 5' radius			
1. *Toxicodendron diversilobum*	25	yes	FACU
2. *Genista monspessulana*	9	yes	NL
3.			
4.			
Sapling/Shrub Stratum Total Cover:	34		
HERB STRATUM **Plot Size:** 5' radius			
1. *Briza maxima*	20	yes	NL
2. *Festuca perennis*	20	yes	FAC
3. *Cynosurus echinatus*	10	yes	NL
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	50		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum 16 % cover of biotic crust 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	1	(A)
Total number of dominant species across all strata?	6	(B)
% of dominant species that are OBL, FACW, or FAC?	17	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample point does not meet hydrophytic vegetation indicators.

SOIL

Sampling Point SP03

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-3	10YR 3/2	100					silty clay loam	
3-10	7.5YR 4/4	100					silty clay loam	
10-12	7.5YR 4/4	99	7.5YR 4/6	1	C	M	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ______

Depth (inches): ______

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: The sample point does not meet hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	☐ Yes	☒ No	Depth (inches): ______
Water table present?	☐ Yes	☒ No	Depth (inches): ______
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (inches): ______

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not meet wetland hydrology indicators.

Wetland Determination Data Form - Arid West Region

Project/Site: Foss Creek Pathway | City: Healdsburg | County: Sonoma | Sampling Date: 6/17/2017

Applicant/Owner: City of Healdsburg | State: CA | Sampling Point: **SP04**

Investigator(s): Kate Allan, Scott Batiuk | Section,Township,Range: Land Grant - Sotoyome

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): concave | Slope(%): 0-1

Subregion(LRR): California | Lat: 38.62934947 | Long: -122.8743311 | Datum: WGS 84

Soil Map Unit Name: Zamora silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☒ Yes	☐ No
Hydric Soil Present?	☒ Yes	☐ No
Wetland Hydrology Present?	☒ Yes	☐ No

Is the Sampled Area within a Wetland? ☒ **Yes** ☐ **No**

Remarks: Wetland sample pointt in a shallow, linear swale in a mowed field east of the railroad tracks in the central portion of the site. The sample point samples wetland feature w06. SP04 and SP05 are paired.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 20' x 2'			
1. *Festuca perennis*	45	yes	FAC
2. *Hordeum marinum*	25	yes	FAC
3. *Plantago lanceolata*	7	no	FAC
4. *Cyperus eragrostis*	2	no	FACW
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	79		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 16 | % cover of biotic crust: 5

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	2	(A)
Total number of dominant species across all strata?	2	(B)
% of dominant species that are OBL, FACW, or FAC?	100	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☒ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: The sample point meets the Dominance Test hydropytic vegetation indicator.

SOIL

Sampling Point SP04

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 3/2	100					gravelly sandy	
4-10	10YR 4/3	100	7.5YR 3/4	<1	C	M	sandy clay loam	
10-14	10YR 4/3	60	7.5YR 4/6	1	C	M	sandy clay loam	
	10YR 4/2	40					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☒ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: The soil profile is comprised of compact gravel fill. The sample point does not meet any of the non-probmatic hydric soil indicators. However, it does meet hydrophytic vegetation and wetland hydrology indicators, and it is located in a shallow, seasonally ponded depression. Therefore, the soil should be considered hydric.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☒ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☒ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches): ____________

Water table present? ☐ Yes ☒ No Depth (inches): ____________

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches): ____________

Wetland Hydrology Present ? ☒ **Yes** ☐ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point meets the Water-Stained Leaves and Biotic Crust wetland hydrology indicators.

Wetland Determination Data Form - Arid West Region

Project/Site: Foss Creek Pathway | City: Healdsburg | County: Sonoma | Sampling Date: 6/17/2017

Applicant/Owner: City of Healdsburg | State: CA | Sampling Point: **SP05**

Investigator(s): Kate Allan, Scott Batiuk | Section,Township,Range: Land Grant - Sotoyome

Landform (hillslope, terrace, etc.): terrace | Local Relief (concave, convex, none): convex | Slope(%): 2

Subregion(LRR): California | Lat: 38.62934844 | Long: -122.874314 | Datum: WGS 84

Soil Map Unit Name: Zamora silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☒ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? ☐ Yes ☒ No
Hydric Soil Present? ☐ Yes ☒ No
Wetland Hydrology Present? ☐ Yes ☒ No

Is the Sampled Area within a Wetland? ☐ **Yes** ☒ **No**

Remarks: Upland sample point on a gentle slope adjacent to the manmade ditch sampled in SP04 in the cnetral portion of the site. The sample point meets a hydrophytic vegetation indicator, but it does not meet hydric soil or wetland hydrology indicators. SP04 and SP05 are paired.

VEGETATION (use scientific names)

TREE STRATUM Plot Size: N/A	Absolute % cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM Plot Size: N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM Plot Size: 5' radius			
1. *Festuca perennis*	80	yes	FAC
2. *Plantago lanceolata*	15	no	FAC
3. *Foeniculum vulgare*	5	no	NL
4.			
5.			
6.			
7.			
8.			
Herb Stratum Total Cover:	100		
WOODY VINE STRATUM Plot Size: N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 0 | % cover of biotic crust: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	1	(A)
Total number of dominant species across all strata?	1	(B)
% of dominant species that are OBL, FACW, or FAC?	100	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:
OBL species		x1
FACW species		x2
FAC species		x3
FACU species		x4
UPL species		x5
Column Totals	(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

☒ Dominance Test is >50%
☐ Prevalence Index is </= 3.0[1]
☐ Morphological adaptations (provide supporting data in remarks)
☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☒ Yes ☐ No

Remarks: The sample point meets the Dominance Test hydropytic vegetation indicator.

SOIL

Sampling Point SP05

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 3/2	100					gravelly sandy	
4-10	10YR 4/3	100	7.5YR 3/4	<1	C	M	sandy clay loam	
10-14	10YR 4/3	60	7.5YR 4/6	1	C	M	sandy clay loam	
	10YR 4/2	40					sandy clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type: ____________

Depth (inches): ____________

Hydric Soil Present ? ☐ **Yes** ☒ **No**

Remarks: The soil profile is comprised of compact gravel fill. The sample point does not meet hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present?	☐ Yes	☒ No	Depth (inches):
Water table present?	☐ Yes	☒ No	Depth (inches):
Saturation Present? (includes capillary fringe)	☐ Yes	☒ No	Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not meet wetland hydrology indicators.

Wetland Determination Data Form - Arid West Region

Project/Site: Foss Creek Pathway | City: Healdsburg | County: Sonoma | Sampling Date: 6/17/2017

Applicant/Owner: City of Healdsburg | State: CA | Sampling Point: **SP06**

Investigator(s): Kate Allan, Scott Batiuk | Section,Township,Range: Land Grant - Sotoyome

Landform (hillslope, terrace, etc.): terrace (ditch) | Local Relief (concave, convex, none): concave | Slope(%): 1

Subregion(LRR): California | Lat: 38.63418524 | Long: -122.8746806 | Datum: WGS 84

Soil Map Unit Name: Zamora silty clay loam, 0 to 2 percent slopes | NWI classification: N/A

Are climatic/hydrologic conditions on-site typical for this time of year? ☐ Yes ☐ No (If no, explain in remarks)

Are any of the following significantly disturbed? ☐ Vegetation ☐ Soil ☐ Hydrology | Are "Normal Circumstances" present? ☒ Yes ☐ No

Are any of the following naturally problematic? ☐ Vegetation ☐ Soil ☐ Hydrology (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	☐ Yes ☒ No	**Is the Sampled Area within a Wetland?** ☐ **Yes** ☒ **No**
Hydric Soil Present?	☒ Yes ☐ No	
Wetland Hydrology Present?	☐ Yes ☒ No	

Remarks: Upland sample point taken in a very shallow, linear depression situated between railroad tracks and a parking lot in the northern portion of the site. The sample point meets a primary hydric soil indicator, but it does not meet hydrophytic vegetation or wetland hydrology indicators.

VEGETATION (use scientific names)

	Absolute % cover	Dominant Species?	Indicator Status
TREE STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Tree Stratum Total Cover:			
SAPLING/SHRUB STRATUM **Plot Size:** N/A			
1.			
2.			
3.			
4.			
Sapling/Shrub Stratum Total Cover:			
HERB STRATUM **Plot Size:** 5' radius			
1. *Briza maxima*	25	yes	NL
2. *Festuca perennis*	20	yes	FAC
3. *Plantago lanceolata*	15	no	FAC
4. *Cynodon dactylon*	10	no	FACU
5. *Foeniculum vulgare*	5	no	NL
6. *Hypochaeris radicata*	5	no	FACU
7. *Lactuca serriola*	5	no	FACU
8.			
Herb Stratum Total Cover:	85		
WOODY VINE STRATUM **Plot Size:** N/A			
1.			
2.			
Woody Vines Total Cover:			

% Bare ground in herb stratum: 15 | % cover of biotic crust: 0

Dominance Test Worksheet

Number of Dominant Species that are OBL, FACW, or FAC?	1	(A)
Total number of dominant species across all strata?	2	(B)
% of dominant species that are OBL, FACW, or FAC?	50	(A/B)

Prevalence Index Worksheet

Total % cover of:		Multiply by:	
OBL species		x1	
FACW species		x2	
FAC species		x3	
FACU species		x4	
UPL species		x5	
Column Totals		(A)	(B)

Prevalence Index = B/A =

Hydrophytic Vegetation Indicators

- ☐ Dominance Test is >50%
- ☐ Prevalence Index is </= 3.0[1]
- ☐ Morphological adaptations (provide supporting data in remarks)
- ☐ Problematic hydrophytic vegetation[1] (explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present ? ☐ Yes ☒ No

Remarks: The sample point does not meet hydrophytic vegetation indicators.

SOIL

Sampling Point SP06

Profile description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[1]	Texture	Remarks
0-4	10YR 4/2	100					clay loam	
4-6	10YR 5/1	85	7.5YR 4/8	15	C	M, PL	silty clay loam	
6-10	10YR 6/1	27	7.5YR 4/4	3	C	M, PL	silty clay loam	
	10YR 5/4	70					silty clay loam	
10-12	10YR 5/3	85	7.5YR 4/6	15	C	M, PL	silty clay loam	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix. [2]Location: PL=Pore Lining, RC=Root Channel, M=Matrix

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5)(LRR C)
- ☐ 1cm Muck (A9)(LRR D)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☒ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ☐ 1cm Muck (A9) (LRR C)
- ☐ 2cm Muck (A10)(LRR B)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Other (explain in remarks)

[3]Indicators of hydric vegetation and wetland hydrology must be present.

Restrictive Layer (if present):

Type:

Depth (inches):

Hydric Soil Present ? ☒ **Yes** ☐ **No**

Remarks: The sample point meets the Depleted Matrix hydric soil indicator.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)(Nonriverine)
- ☐ Sediment Deposits (B2)(Nonriverine)
- ☐ Drift Deposits (B3)(Nonriverine)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Biotic Crust (B12)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in PLowed Soils (C6)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water Marks (B1)(Riverine)
- ☐ Sediment Deposits (B2)(Riverine)
- ☐ Drift Deposits (B3)(Riverine)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Thin Muck Surface (C7)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)

Field Observations:

Surface water present? ☐ Yes ☒ No Depth (inches):

Water table present? ☐ Yes ☒ No Depth (inches):

Saturation Present? (includes capillary fringe) ☐ Yes ☒ No Depth (inches):

Wetland Hydrology Present ? ☐ **Yes** ☒ **No**

Describe recorded data (stream guage, monitoring well, aerial photos, etc.) if available.

Remarks: The sample point does not meet wetland hydrology indicators.

APPENDIX C

Arborist Report

Tree Survey Report

FOSS CREEK PATHWAY PROJECT SEGMENTS 7 AND 8
HEALDSBURG, SONOMA COUNTY, CALIFORNIA

Prepared For:

Coastland Civil Engineering, Inc.
1400 Neotomas Ave.
Santa Rosa, CA 95405

Contact: John Wanger, CEO

Prepared By:

WRA, Inc.
2169-G East Francisco Boulevard
San Rafael, California 94901

Contacts:
Justin Semion, Principal
spicher@wra-ca.com

Scott Yarger, ISA-Certified Arborist #WE-9300A
yarger@wra-ca.com

Date:
February 2018 (Updated 3/18/19)

WRA Project No:
27077

ENVIRONMENTAL CONSULTANTS

TABLE OF CONTENTS

LIST OF TABLES

APPENDICES

1.0 INTRODUCTION

On December 19, 2017 and February 5, 2018 WRA, Inc. (WRA) conducted a comprehensive tree survey at the site of the proposed Foss Creek Pathway Segments 7 and 8 Project (Project), located between the intersection of Healdsburg Avenue and Grove Street, and Grant Street in the western portion of the City of Healdsburg, Sonoma County, California (Project Area). WRA's ISA Certified Arborist, Scott Yarger (ISA #WE-9300A) conducted this survey for the purpose of identifying and documenting the presence of all trees as defined by the City of Healdsburg Tree Ordinance within and directly adjacent to the limit of grade of the Project Area.

This report provides a survey of all trees within the limit of grade of the proposed pathway, and also includes a survey of all trees which are outside of the limit of grade of the pathway, whose driplines and/or root zones overhang the pathway, and thus may require pruning to facilitate the Project. GPS locations for all surveyed within the Project Area and information regarding the species, size in diameter at breast height (DBH; as measured 4.5 feet above grade), estimated crown radius, estimated height and health, structure, and overall condition ratings were collected and are included in this report. A table with all the relevant information pertaining to surveyed trees is provided in Appendix A. A tree survey location map is provided in Appendix B.

1.1 Project Area Description

Segments 7 & 8 of the Foss Creek Pathway (Project Area) are located along the western edge of the City of Healdsburg within the public right-of-way (ROW). The site consists of a narrow strip of land paralleling Highway 101 and Grove Street to the west. Segment 7 commences from the northern edge of Segment 6, and would include a pedestrian bridge crossing which crosses over Foss Creek and runs through adjacent riparian woodland habitat. Segment 7 continues paralleling Foss Creek and the Northwestern Pacific Railroad tracks from south of Monte Vista Avenue to Dry Creek Road. Segment 8 continues from the northern side of Dry Creek Road to Grove Street, west of the Grove Street and Healdsburg Avenue Intersection). All improvements would take place within the existing Northwestern Pacific Railroad ROW and associated easements.

1.2 Regulatory Background

The City of Healdsburg Municipal code regulates the protection of significantly-sized "heritage trees" in order to preserve and protect their contribution to the community, improve the quality of the environment, aid in the control of erosion, and support forms of life that are beneficial to the community interest. Heritage trees are defined by the Tree Ordinance as "any tree that has a diameter of thirty (30) inches or more, measured two (2) feet above the level ground," or any tree or group of trees identified by City Council resolution as being worthy of heritage tree protection due to historic or cultural value to the community. A tree permit from the City of Healdsburg is required for the removal, relocation or for conducting ground disturbance work within the protected zone (area within the dripline, from the trunk of the tree to the outer extent of the tree canopy) of any heritage tree as defined above.

The design review application process requires a survey of all “trees”, as defined per the Tree Ordinance within the Project Area. A tree is defined by the Tree Ordinance as “any woody perennial plant with a single trunk diameter of six (6) inches or more or a combination of multiple trunks with a total diameter of twelve (12) inches or more, measured four and one-half (4.5) feet above the average natural grade.”

2.0 METHODS

On December 19, 2017 and February 5, 2018 the Project Area was traversed on foot to inventory all heritage and non-heritage trees as defined per the City of Healdsburg Tree Ordinance, within the limit of grade of the pathway, as well as all trees outside of the Project Area with overhanging canopies and/or root zones which may require pruning to facilitate the Project. WRA’s ISA-Certified Arborist surveyed the area and recorded relevant tree information for each surveyed tree including species, DBH, estimated crown radius, estimated height, and health, condition and structure rankings.

2.1 Tree Inventory

The survey inventoried all “trees” within the Project Area, as defined by the Tree Ordinance, as having one major trunk measuring 6 inches DBH or greater, or a tree with multiple trunks with an aggregate DBH of 12 inches or greater. Heritage and non-heritage trees outside of the with canopies that overhang limit of grade of the pathway which may require trimming or root pruning to facilitate the Project were also surveyed.

Locations of surveyed trees within and directly adjacent to the Project Area were recorded using a handheld GPS unit with sub-meter accuracy. Each surveyed tree was given an aluminum tree tag with unique identification number. Information including species, size, health, structure, and overall condition ratings were recorded. The diameters of heritage-sized trees were measured at two feet above ground, as instructed by the Tree Ordinance whereas non-heritage trees were measured in the industry-standard diameter at breast height (DBH), at 4.5 feet above ground. In cases where an irregular buttress or bulge at two feet above ground or DBH, measurements were taken above or below the irregular feature in order to best represent the size of the tree.

2.2 Tree Assessment

General notes on the condition of trees were taken, including health, structure, and overall condition. Assessment of the health, structure, and overall condition of each tree was conducted according to the narratives listed in Table 1.

Table 1. Rating narratives for tree assessment

Health	
Good	Tree is free from symptoms of disease and stress.
Fair	Tree shows some symptoms of disease or stress including twig and small branch dieback, evidence of fungal / parasitic infection, thinning of crown, or poor leaf color.

Poor	Tree shows symptoms of severe decline.
Structure	
Good	Tree is free from major structural defects.
Fair	Tree shows some structural defects in branches but overall structure is stable.
Poor	Tree shows structural failure of a major branch or co-dominant trunk.
General Condition	
Good	Tree shows condition of foliage, bark, and overall structure characteristic of the species and lacking obvious defect, or disease.
Fair	Tree shows condition of foliage, bark, and overall structure characteristic of the species with some evidence of stress, defect, or disease.
Poor	Tree shows condition of foliage, bark, and overall structure uncharacteristic of the species with obvious evidence of stress, defect, or disease.

2.3 Tree Impact Assessment

Potential impacts to surveyed trees were analyzed in GIS. The Project footprint (i.e. the alignment of the proposed pathway was overlaid on tree survey data to determine which trees will potentially be impacted by removal or trimming (Appendix B). Potential impacts were assessed based on the location inside or outside of the limit of grade of the Project Area. Trees located inside the limit of grade were considered “potential removal”, while trees outside of the limit of grade, with canopies or root zones which overlap the limit of grade were considered to potentially require pruning (Appendix A).

3.0 RESULTS

3.1 Tree Inventory

A total of 86 trees were inventoried during this assessment, including seven heritage trees, and 79 non-heritage trees. A complete list of all trees surveyed within the Study Area is included in Appendix A. The GPS locations of surveyed trees are shown in Appendix B. Heritage trees present within the Project Area are predominantly coast live oak (*Quercus agrifolia*), but also included red willow (*Salix laevigata*), and Oregon ash (*Fraxinus latifolia*). Non-heritage trees surveyed included all of the aforementioned heritage tree species as well as coast redwood (*Sequoia sempervirens*), valley oak (*Quercus lobata*), red oak (*Q. rubra*), Callery pear (*Pyrus calleryana*), London plane (*Platanus* x *acerifolia*), and arroyo willow (*Salix lasiolepis*).

The largest heritage tree surveyed was a 71-inch multi-trunk Oregon ash (tree #706), located in the riparian zone associated with Foss Creek at the southern terminus of the Project Area. The largest single-trunk tree surveyed was a 39.1-inch heritage coast live oak (tree #739). Among all 82 trees surveyed, DBH ranged from 6 to 71 inches. Approximate canopy radii averaged from 6 to 30 feet. Approximate height ranged from 12 to 60 feet.

3.2 Tree Assessment

The majority of trees within the Project Area are in good condition, with good form, and vigorous growth habits. Trees that generally ranked ‘good’ in condition, health, and structure included most of the valley oaks, London planes, coast redwoods, and coast live oaks within the Project Area. Trees that generally ranked ‘poor’ included several arroyo willow and red willow within the Foss Creek riparian zone. Two of these trees assessed in poor condition were heritage trees, including a 71-inch multi-trunk Oregon ash (tree #706), and a 56-inch multi-trunk red willow (tree #707). Both of these trees were overmature, multi-trunk trees with previous failures of one or more trunks, and major heartwood decay was evident throughout.

Other maladies commonly observed throughout the Project Area affecting trees included codominant trunks with included bark, small to significant crown and/or branch dieback, cankers, heartrot, poor leaf color, and trunk and scaffold branch rot. The overall condition, structural condition, health of inventoried trees was found to be generally fair to good with the majority of trees ranking good in condition, health, and structure. Table 3 below summarizes the assessment results of all inventoried trees in the Project Area.

Table 2. Tree assessment results summary

Criteria Assessed/Rating	Condition	Health	Structure
Good	52 (60%)	58 (67%)	40 (46%)
Fair	25 (29%)	21 (23%)	36 (42%)
Poor	9 (11%)	8 (9%)	10 (12%)

3.3 Tree Impact Assessment

A total of 22 trees are anticipated to be removed by the Project, none of which are large enough to be considered heritage trees. Seven heritage trees have canopy driplines which overhang the pathway alignment, and therefore could potentially be impacted by the Project. Although impacts to heritage trees from trail construction are likely to be minimal grading footprint, potential impacts to the canopy or root system could include damage to branches or trunk during construction, or ripping or tearing roots during subgrade excavation, if necessary. These types of injuries should be avoided as they can lead to reduced tree vigor, increased susceptibility to pathogens or pests, or in severe cases eventual tree decline or death. Potential permit, mitigation, and tree protection requirements as required by the Tree Ordinance are provided below.

4.0 SUMMARY AND RECOMMENDATIONS

4.1 Tree Removal Permit Requirements

It is typically understood that cities and municipalities are exempt from their own tree protection ordinances. However, the Healdsburg Tree Ordinance does not appear to specifically identify such an exemption. If the pathway project is considered non-exempt, a Tree Permit from the City of Healdsburg may be required for encroachment into the dripline of any heritage tree. Conditions of approval, potential mitigation, and required tree protection measures are defined by Sections 20.24.070, 20.24.075, and 20.24.080 of the City of Healdsburg Municipal Code. The Project shall follow conditions of approval, tree replacement requirements, and tree protection guidelines of the tree removal permit for the Project as summarized/excerpted below.

4.2 Tree Replacement Requirements

One heritage trees is likely to be removed as part of the Project. The following tree replacement requirements may apply, as excerpted from Section 20.24.075 of the City Code:

When heritage trees are to be removed, they shall be replaced at a ratio of three (3) new trees for every heritage tree removed. Replacement trees proposed to be planted within a public right-of-way shall be approved by the City Arborist.

If the Planning and Building Director determines it would be infeasible to plant replacement trees on the same site or within immediately adjacent rights-of-way, an in-lieu equivalent fee may be paid based on a schedule of in-lieu fees established by the City Council. In-lieu fees collected shall be placed in a "Tree Planting and Maintenance Fund" to be used for the purpose of planting and maintaining trees throughout the city.

4.3 City Tree Protection Guidelines

In order to avoid and minimize damage to existing trees which are designated for preservation and not proposed for direct impact by project activities, the Project shall follow all tree protection guidelines outlined in Section 20.24.080 of the City Code as excerpted below:

A. Development proposals shall protect and preserve heritage trees to the fullest extent possible. Care shall be exercised by all individuals, builders, contractors and others working near protected trees so that no damage occurs to such trees.
B. The following measures shall be used to preserve and protect the health of trees to remain, relocated trees and new trees planted to replace those removed.
    - All trees to be saved shall be enclosed by a construction barrier placed around the protected zone of the tree, including but not limited to chain link fencing or other material acceptable to the Planning and Building Director and City Arborist, prior to the issuance of any grading or building permit and prior to the commencement of work. Barriers are to remain intact until construction is complete and may not be removed without the written consent of the Planning and Building Director.
    - When proposed development or other site work is to encroach into the protected zone of a tree, special measures shall be incorporated to allow for safe and healthy conditions for protected trees.

- Any excavation, cutting, filling, paving or construction of the existing ground surface within the protected zone of a tree shall be minimized. No adverse significant change in existing ground level shall occur within the drip line of a protected tree.
- Development proposals shall be configured to retain as many heritage and significant trees as possible.
- Construction equipment and material shall not be stored within tree protection areas. No oil, gas, chemicals or other substances that may be harmful to trees shall be stored or dumped within the protected zone or any other location on the site from which such substances might enter the protected zone.
- Trenching within the protected zone of trees shall be avoided wherever possible. Trenching for utilities shall avoid major roots and, if avoidance is impractical, tunnels shall be made below roots. Trenching is to be consolidated to serve as many units as possible. Trenching within the protected zone shall be done by hand to minimize impacts.
- Additional measures may be imposed by the Planning and Building Director to protect and preserve the health of the trees to remain, relocated trees and new trees planted to replace those removed.

In addition to the tree protection measures described above, any trees that require trimming and/or root pruning to accommodate construction shall be pruned to American National Standards Institute (ANSI) A300 standards for tree care practices. An ISA-Certified Arborist or tree specialist shall be retained to perform any necessary pruning of heritage trees during construction activity. The qualified Arborist shall supervise all pruning, relocation and trimming of heritage and significant trees and shall monitor construction activities where feasible to ensure protection of heritage trees during construction.

Additional conditions of approval may apply, including: a five (5) year minimum maintenance and preservation program, secured by a cash surety; and development of appropriate conditions, covenants and restrictions, landscape easements, special assessment districts and other measures to protect significant and heritage trees.

5.0 REFERENCES

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken (eds.). 2012. The Jepson Manual: Vascular Plants of California, second edition. University of California Press, Berkeley, California.

City of Healdsburg. 2011. City of Healdsburg Land Use Code, Title 20 of the Healdsburg Municipal Code, Article II, "Heritage Tree Protection."

Costello, L. R., B. W. Hagen and K. S. Jones. 2011. Oaks in the Urban Landscape – Selection, Care, and Preservation. University of California Agricultural and Natural Resources Publication 3518.

Fite, K. and E.T. Smiley. 2008. Managing Trees During Construction: Best Management Practices. Companion publication to the ANSI A300 Part 5: Tree, Shrub, and Other Woody Plant Maintenance – Standard Practices (Management of Trees and Shrubs During Site Development, and Construction). International Society of Arboriculture, P.O. Box 3129, Champaign, IL.

Google Earth. 2018. Aerial Photography 1993-2017.

Hatch, C. R. 2007. Trees of the California Landscape: A Photographic Manual of Native and Ornamental Trees. University of California Press, Berkeley, CA.

APPENDIX A

TREE SURVEY TABLE

Appendix A. Foss Creek Pathway Segments 7 and 8 Project Tree Survey, Healdsburg, Sonoma County, California. February 2018.

Tag ID	Species	Common Name	Multistem	Diameter 1	Diameter 2	Diameter 3	Diameter 4	Diameter 5	Total Diameter* (inches)	Estimated Dripline Radius (feet)	Estimated Height (feet)	Condition	Health	Structure	Heritage Tree	Tree Removal?
460	*Quercus lobata*	valley oak	Yes	10.50	5.30	0.00	0.00	0.00	15.80	12.00	30.00	Good	Good	Good	No	No
461	*Sequoia sempervirens*	redwood	No	19.40	0.00	0.00	0.00	0.00	19.40	10.00	55.00	Good	Good	Good	No	No
462	*Sequoia sempervirens*	redwood	No	8.60	0.00	0.00	0.00	0.00	8.60	8.00	35.00	Good	Good	Fair	No	No
463	*Sequoia sempervirens*	redwood	No	21.20	0.00	0.00	0.00	0.00	21.20	15.00	60.00	Fair	Fair	Fair	No	No
464	*Sequoia sempervirens*	redwood	Yes	7.10	4.00	10.00	0.00	0.00	21.10	10.00	35.00	Good	Good	Fair	No	No
465	*Sequoia sempervirens*	redwood	No	18.50	0.00	0.00	0.00	0.00	18.50	12.00	40.00	Fair	Fair	Fair	No	No
466	*Quercus lobata*	valley oak	Yes	6.90	4.90	5.40	2.50	0.00	19.70	14.00	40.00	Fair	Fair	Fair	No	Yes
467	*Quercus rubra*	red oak	No	14.00	0.00	0.00	0.00	0.00	14.00	25.00	45.00	Fair	Fair	Fair	No	No
468	*Quercus rubra*	red oak	No	12.90	0.00	0.00	0.00	0.00	12.90	17.00	45.00	Fair	Fair	Good	No	No
469	*Quercus agrifolia*	coast live oak	No	9.70	0.00	0.00	0.00	0.00	9.70	11.00	30.00	Good	Good	Good	No	No
470	*Sequoia sempervirens*	redwood	No	12.40	0.00	0.00	0.00	0.00	12.40	10.00	35.00	Good	Good	Good	No	Yes
471	*Pyrus calleryana*	Callery pear	No	6.10	0.00	0.00	0.00	0.00	6.10	18.00	30.00	Fair	Good	Fair	No	No
472	*Quercus agrifolia*	coast live oak	Yes	4.50	4.00	3.00	3.00	2.00	16.50	10.00	14.00	Good	Good	Fair	No	No
473	*Quercus agrifolia*	coast live oak	No	9.50	0.00	0.00	0.00	0.00	9.50	9.00	14.00	Poor	Fair	Poor	No	No
474	*Quercus agrifolia*	coast live oak	No	8.80	0.00	0.00	0.00	0.00	8.80	11.00	25.00	Good	Good	Fair	No	No
475	*Quercus agrifolia*	coast live oak	Yes	7.00	5.00	0.00	0.00	0.00	12.00	11.00	12.00	Good	Good	Fair	No	No
476	*Quercus agrifolia*	coast live oak	No	9.50	0.00	0.00	0.00	0.00	9.50	12.00	18.00	Good	Good	Fair	No	No
477	*Quercus agrifolia*	coast live oak	Yes	6.30	6.30	0.00	0.00	0.00	12.60	10.00	18.00	Good	Good	Good	No	No
478	*Quercus agrifolia*	coast live oak	Yes	4.00	3.50	3.50	4.00	3.00	18.00	8.00	12.00	Good	Good	Fair	No	No
479	*Quercus agrifolia*	coast live oak	No	6.00	0.00	0.00	0.00	0.00	6.00	8.00	13.00	Good	Fair	Good	No	No
480	*Quercus lobata*	valley oak	No	6.00	0.00	0.00	0.00	0.00	6.00	10.00	30.00	Good	Good	Good	No	Yes
481	*Platanus x acerifolia*	London plane	No	9.50	0.00	0.00	0.00	0.00	9.50	17.00	30.00	Good	Good	Good	No	Yes
482	*Platanus x acerifolia*	London plane	No	6.10	0.00	0.00	0.00	0.00	6.10	10.00	30.00	Good	Good	Good	No	Yes
483	*Quercus agrifolia*	coast live oak	No	6.70	0.00	0.00	0.00	0.00	6.70	6.00	22.00	Poor	Poor	Poor	No	No
484	*Platanus x acerifolia*	London plane	No	9.10	0.00	0.00	0.00	0.00	9.10	16.00	30.00	Good	Good	Good	No	Yes
485	*Quercus agrifolia*	coast live oak	No	12.00	0.00	0.00	0.00	0.00	12.00	16.00	20.00	Fair	Good	Fair	No	No
486	*Platanus x acerifolia*	London plane	No	7.00	0.00	0.00	0.00	0.00	7.00	13.00	30.00	Good	Good	Good	No	Yes
487	*Platanus x acerifolia*	London plane	No	7.50	0.00	0.00	0.00	0.00	7.50	14.00	30.00	Good	Good	Good	No	Yes
488	*Quercus agrifolia*	coast live oak	No	6.00	0.00	0.00	0.00	0.00	6.00	10.00	25.00	Fair	Good	Fair	No	No
489	*Platanus x acerifolia*	London plane	No	8.80	0.00	0.00	0.00	0.00	8.80	16.00	40.00	Good	Good	Good	No	Yes
490	*Platanus x acerifolia*	London plane	No	11.00	0.00	0.00	0.00	0.00	11.00	15.00	35.00	Poor	Poor	Fair	No	No
491	*Quercus lobata*	valley oak	Yes	6.00	5.50	0.00	0.00	0.00	11.50	18.00	35.00	Fair	Good	Fair	No	No
492	*Quercus lobata*	valley oak	Yes	6.00	5.50	0.00	0.00	0.00	11.50	12.00	30.00	Good	Good	Good	No	No
493	*Quercus lobata*	valley oak	Yes	6.40	6.00	3.80	0.00	0.00	16.20	12.00	35.00	Good	Good	Fair	No	No
494	*Platanus x acerifolia*	London plane	No	7.20	0.00	0.00	0.00	0.00	7.20	12.00	30.00	Good	Good	Good	No	No
495	*Platanus x acerifolia*	London plane	No	11.20	0.00	0.00	0.00	0.00	11.20	20.00	35.00	Good	Good	Good	No	No
496	*Quercus lobata*	valley oak	No	6.80	0.00	0.00	0.00	0.00	6.80	15.00	30.00	Fair	Good	Fair	No	No
497	*Sequoia sempervirens*	redwood	No	21.00	0.00	0.00	0.00	0.00	21.00	15.00	55.00	Good	Good	Good	No	No
498	*Quercus lobata*	valley oak	Yes	14.00	5.30	5.30	0.00	0.00	24.60	20.00	40.00	Fair	Good	Fair	No	No
499	*Sequoia sempervirens*	redwood	No	18.10	0.00	0.00	0.00	0.00	18.10	12.00	55.00	Good	Good	Good	No	No
500	*Quercus agrifolia*	coast live oak	Yes	6.30	3.00	0.00	0.00	0.00	9.30	9.00	16.00	Good	Good	Good	No	No
701	*Quercus agrifolia*	coast live oak	Yes	6.50	7.20	5.50	6.10	5.00	30.30	14.00	19.00	Fair	Fair	Fair	Yes	Yes
702	*Quercus agrifolia*	coast live oak	Yes	23.00	10.80	0.00	0.00	0.00	33.80	15.00	25.00	Fair	Good	Fair	Yes	No
703	*Quercus agrifolia*	coast live oak	No	6.30	0.00	0.00	0.00	0.00	6.30	10.40	15.00	Good	Good	Good	No	Yes
704	*Quercus agrifolia*	coast live oak	No	36.00	0.00	0.00	0.00	0.00	36.00	30.00	50.00	Good	Good	Good	Yes	No
705	*Fraxinus latifolia*	Oregon ash	No	19.50	0.00	0.00	0.00	0.00	19.50	25.00	35.00	Fair	Fair	Fair	No	No
706	*Fraxinus latifolia*	Oregon ash	Yes	20.00	13.00	14.00	14.00	10.00	71.00	30.00	50.00	Poor	Poor	Poor	Yes	No
707	*Salix laevigata*	red willow	Yes	40.00	16.00	0.00	0.00	0.00	56.00	20.00	45.00	Poor	Poor	Poor	Yes	No
708	*Salix laevigata*	red willow	Yes	36.00	14.00	0.00	0.00	0.00	50.00	40.00	30.00	Fair	Fair	Fair	Yes	No
709	*Salix lasiolepis*	arroyo willow	Yes	9.00	6.20	4.20	0.00	0.00	19.40	15.00	35.00	Poor	Poor	Poor	No	Yes
710	*Salix lasiolepis*	arroyo willow	No	6.00	0.00	0.00	0.00	0.00	6.00	8.00	15.00	Poor	Poor	Poor	No	Yes
711	*Fraxinus latifolia*	Oregon ash	No	10.00	0.00	0.00	0.00	0.00	10.00	9.00	25.00	Fair	Fair	Fair	No	No
712	*Salix lasiolepis*	arroyo willow	Yes	4.00	4.00	4.00	4.00	4.00	20.00	15.00	15.00	Poor	Poor	Poor	No	No
713	*Salix lasiolepis*	arroyo willow	Yes	4.00	3.00	2.00	2.00	2.00	13.00	8.00	11.00	Fair	Fair	Poor	No	No
714	*Quercus lobata*	valley oak	Yes	7.00	6.50	7.00	5.00	0.00	25.50	15.00	35.00	Good	Good	Good	No	No
715	*Sequoia sempervirens*	coast redwood	Yes	4.00	2.00	2.00	2.00	2.00	12.00	5.00	8.00	Dead	n/a	n/a	No	No
716	*Platanus x acerifolia*	London plane	No	12.00	0.00	0.00	0.00	0.00	12.00	16.00	40.00	Good	Good	Good	No	No
717	*Quercus lobata*	valley oak	Yes	6.00	5.00	0.00	0.00	0.00	11.00	10.00	30.00	Good	Good	Fair	No	No
718	*Platanus x acerfiolia*	London plane	No	11.00	0.00	0.00	0.00	0.00	11.00	18.00	30.00	Good	Good	Good	No	No
719	*Sequoia sempervirens*	coast redwood	No	21.20	0.00	0.00	0.00	0.00	21.20	16.00	40.00	Good	Good	Good	No	No
720	*Sequoia sempervirens*	coast redwood	No	20.20	0.00	0.00	0.00	0.00	20.20	16.00	40.00	Good	Good	Good	No	No
721	*Quercus lobata*	valley oak	No	7.20	0.00	0.00	0.00	0.00	7.20	10.00	22.00	Good	Good	Good	No	Yes
722	*Quercus lobata*	valley oak	No	18.00	0.00	0.00	0.00	0.00	18.00	25.00	35.00	Fair	Fair	Fair	No	No
723	*Quercus lobata*	valley oak	No	14.30	0.00	0.00	0.00	0.00	14.30	18.00	25.00	Good	Good	Good	No	No
724	*Quercus agrifolia*	coast live oak	No	7.90	0.00	0.00	0.00	0.00	7.90	9.00	12.00	Good	Good	Good	No	Yes
725	*Quercus lobata*	valley oak	Yes	8.00	10.00	11.00	0.00	0.00	29.00	15.00	35.00	Good	Good	Good	No	No
726	*Quercus lobata*	valley oak	Yes	13.10	6.00	5.00	0.00	0.00	24.10	15.00	40.00	Good	Good	Good	No	No
727	*Quercus lobata*	valley oak	No	10.00	0.00	0.00	0.00	0.00	10.00	15.00	25.00	Good	Good	Good	No	No
728	*Quercus lobata*	valley oak	No	15.30	0.00	0.00	0.00	0.00	15.30	18.00	35.00	Good	Good	Good	No	Yes
729	*Quercus agrifolia*	coast live oak	No	8.80	0.00	0.00	0.00	0.00	8.80	10.00	14.00	Good	Good	Good	No	Yes
730	*Quercus agrifolia*	coast live oak	Yes	7.20	4.90	0.00	0.00	0.00	12.10	9.00	15.00	Good	Good	Good	No	Yes
731	*Quercus agrifolia*	coast live oak	No	21.10	0.00	0.00	0.00	0.00	21.10	30.00	35.00	Fair	Good	Fair	No	No
732	*Quercus agrifolia*	coast live oak	No	11.50	0.00	0.00	0.00	0.00	11.50	30.00	15.00	Fair	Fair	Poor	No	No
733	*Quercus agrifolia*	coast live oak	No	18.90	0.00	0.00	0.00	0.00	18.90	20.00	45.00	Good	Good	Good	No	No
734	*Quercus agrifolia*	coast live oak	Yes	13.00	10.00	0.00	0.00	0.00	23.00	25.00	40.00	Good	Good	Fair	No	No
735	*Quercus agrifolia*	coast live oak	No	10.90	0.00	0.00	0.00	0.00	10.90	18.00	35.00	Good	Good	Fair	No	No
736	*Quercus agrifolia*	coast live oak	Yes	13.00	10.00	0.00	0.00	0.00	23.00	25.00	45.00	Good	Good	Fair	No	No
737	*Quercus agrifolia*	coast live oak	No	20.50	0.00	0.00	0.00	0.00	20.50	25.00	45.00	Good	Good	Good	No	No
738	*Quercus agrifolia*	coast live oak	No	15.00	0.00	0.00	0.00	0.00	15.00	25.00	20.00	Fair	Fair	Fair	No	No
739	*Quercus agrifolia*	coast live oak	No	39.10	0.00	0.00	0.00	0.00	39.10	30.00	45.00	Good	Fair	Good	Yes	No
740	*Quercus lobata*	valley oak	No	10.00	0.00	0.00	0.00	0.00	10.00	25.00	30.00	Good	Good	Fair	No	No
741	*Quercus lobata*	valley oak	No	21.00	0.00	0.00	0.00	0.00	21.00	25.00	45.00	Good	Good	Good	No	No
742	*Quercus agrifolia*	coast live oak	No	6.00	0.00	0.00	0.00	0.00	6.00	8.00	12.00	Fair	Fair	Fair	No	Yes
743	*Quercus alba*	white oak	No	8.00	0.00	0.00	0.00	0.00	8.00	10.00	20.00	Fair	Fair	Fair	No	Yes
744	*Quercus alba*	white oak	No	12.00	0.00	0.00	0.00	0.00	12.00	13.00	30.00	Fair	Fair	Fair	No	Yes
745	*Quercus alba*	white oak	No	18.00	0.00	0.00	0.00	0.00	18.00	20.00	35.00	Fair	Fair	Fair	No	Yes

*Non-heritage trees measured at 4.5 feet above grade. Heritage trees measured at 2 feet above grade.

APPENDIX B

TREE SURVEY MAP

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Tree Survey Figure 20180206.mxd

Basemap Source: NAIP 2016

Appendix B. Tree Survey Map

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

WRA ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 3/19/2019
Map Prepared By: mrochelle
Data Source(s): WRA

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Tree Survey Figure 20180206.mxd

Basemap Source: NAIP 2016

Appendix B. Tree Survey Map

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

WRA ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 3/19/2019
Map Prepared By: mrochelle
Data Source(s): WRA

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Tree Survey Figure 20180206.mxd

Basemap Source: NAIP 2016

Appendix B. Tree Survey Map

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

wra ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 3/19/2019
Map Prepared By: mrochelle
Data Source(s): WRA

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Tree Survey Figure 20180206.mxd

Basemap Source: NAIP 2016

Appendix B. Tree Survey Map

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

WRA ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 3/19/2019
Map Prepared By: mrochelle
Data Source(s): WRA

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Tree Survey Figure 20180206.mxd

Basemap Source: NAIP 2016

Appendix B. Tree Survey Map

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

WRA ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 3/19/2019
Map Prepared By: mrochelle
Data Source(s): WRA

Path: L:\Acad 2000 Files\27000\27077\GIS\ArcMap\Tree Survey Figure 20180206.mxd

Basemap Source: NAIP 2016

Appendix B. Tree Survey Map

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

WRA ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 3/19/2019
Map Prepared By: mrochelle
Data Source(s): WRA

Basemap Source: NAIP 2016

Appendix B. Tree Survey Map

Coastland Healdsburg CEQA and Permitting
Healdsburg, California

WRA ENVIRONMENTAL CONSULTANTS

Map Prepared Date: 3/19/2019
Map Prepared By: mrochelle
Data Source(s): WRA

APPENDIX C

REPRESENTATIVE PHOTOGRAPHS

Photograph 1. Photograph depicting tree #461, a non-heritage coast redwood tree assessed in good condition. This tree is not anticipated to be removed by the Project.

Photograph 2. Photograph depicting tree #723, a non-heritage valley oak tree, and tree #702, a heritage coast live oak tree in the southern portion of the Project Area. Both trees are not anticipated to be removed, however, their canopy driplines overhang the proposed trail alignment.

Photograph 3. Photograph depicting tree #732, a non-heritage coast live oak tree exhibiting a significant lean/poor growth form.

Photograph 4. Photograph depicting tree #739, a heritage coast live oak tree located within the Foss Creek riparian zone. This tree is not anticipated to be removed, however, its canopy dripline overhangs the proposed trail alignment.

APPENDIX D

Cultural Resources Data

HISTORIC PROPERTY SURVEY REPORT/FINDING OF EFFECT

(Historic Properties Affected - No Adverse Effect)

FOSS CREEK PATHWAY, SEGMENTS 7 AND 8, CITY OF HEALDSBURG, SONOMA COUNTY

FOR

WRA, Inc.
4225 Hollis Street
Emeryville, CA 94608

ATTN: Jonathan Hidalgo, AICP

BY

BASIN RESEARCH ASSOCIATES
1933 Davis Street, Suite 210
San Leandro, CA 94577

APRIL 2018

TABLE OF CONTENTS

TABLE OF CONTENTS, con't

ATTACHMENTS

FIGURES

CORRESPONDENCE

CHRIS/NWIC SEARCH RESULTS

1.0 INTRODUCTION

This *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) represents the identification and evaluation effort completed for the Foss Creek Pathway, Segments 7 and 8, City of Healdsburg, Sonoma County. The City of Healdsburg, Public Works Department, proposes to extend the existing Foss Creek Pathway (Pathway), a Class I (off-street) paved pedestrian path, that will parallel Foss Creek and/or the Northwestern Pacific Railroad and run along the western edge of the City of Healdsburg. Various segments of the 4.1 mile long pathway have been constructed since 2004 with the last segment, Segment 6, completed in 2015. The proposed Segments 7 & 8 (Project), would complete the Foss Creek Pathway through Reach 4 (Foss Creek North Reach). The proposed undertaking may require the analysis of the project in accordance with Section 404(b)(1) of the Clean Water Act (codified at 33 U.S.C. § 1344) and must comply with the regulatory requirements of the U.S. Department of the Army, Corps of Engineers (Corps) with regard to cultural resources (historic properties).

The Corps (San Francisco District) is the National Environmental Policy Act (NEPA) responsible entity and is required to complete the federal regulatory requirements for cultural resources pursuant to Section 106 of the National Historic Preservation Act (NHPA) of 1966 (as amended) (54 U.S.C. § 306108) and its implementing regulations 36 CFR Part 800. The regulations require a federal agency with jurisdiction over a federal, federally assisted or federally licensed undertaking to take into account the effort of the undertaking on properties listed on or eligible for the National Register of Historic Places (NRHP) and to afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on the undertaking should it adversely affect a NRHP eligible or NRHP listed property.

The criteria for determining NRHP eligibility are found in 36 CFR Part 60. The City of Healdsburg, Public Works Department, is the lead local agency and the Corps (San Francisco District) is the lead federal agency for the project. The Corps is responsible for consulting with the California State Historic Preservation Office (SHPO) on their identification and evaluation efforts and on the effects, if any, of the undertaking upon Historic Properties in accordance with 54 U.S.C. § 302303(b)(5), (b)(6) and (b)(9).

The Area of Potential Effects (APE) for Archaeology includes the area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, should any be present within the APE. The horizontal and vertical APE consists of the proposed construction within the project's right of way (ROW) including access roads to the project area and staging areas for material laydown and storage of excavated spoils.

The proposed project would be constructed in an alignment similar to the original project with a maximum 50-foot wide right of way (ROW). Pathway features will include 10-foot wide asphalt concrete paved pathway, decorative 175 Watt LED lighting, two creek/water crossings, fencing along the pathway, site furniture and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control. All of the improvements will be contained within existing public right of way and easements. The horizontal APE is commensurate with the footprint of the proposed undertaking while the vertical APE is generally 2.0-5.0 feet which is the maximum depth needed to install the path base and topping, small diameter metal posts for the chain link fence and the concrete piers for the precast concrete boardwalk within the wetlands just north of Segment 6 (STA 1+00 to STA 2+00) and at STA 33+00 to STA 34+00. The APE does not include the alignment of the adjacent Northwest Pacific Railroad.

This HPSR/FOE provides supporting materials for the Section 106 identification and evaluation including the results of a records search, a review of pertinent literature, consultation with local Native Americans, and a field review. The completion of this document allows the project proponent to partially satisfy the regulations of the Corps for implementing Section 106 of the NHPA of 1966 as amended.

The proposed Foss Creek Pathway, Sections 7 and 8, will not impact any NRHP historic properties within the APE including potential subsurface cultural resources. One historic property determined eligible for the NRHP for its engineering and design, the Northwestern Pacific Railroad (NWPRR) alignment, is present adjacent to and parallel to the APE. The proposed project will not the affect the resource such that its potential for inclusion on the NRHP under any of the criteria (36 CFR Part 60) could be affected. A determination of *Historic properties affected* (36 CFR Part 800.4(d)(2)) and the finding that the undertaking will have no adverse effect as defined in 36 CFR Part 800.5(a)(1), 800.5(b), and 800.16(i) is applicable

The City of Healdsburg, Public Works Department, as the lead local agency, is required to determine the potential impacts of the construction on both historical and archaeological cultural resources and mitigate impacts on any significant resources may be affected by the project to a less than significant effect in accordance with the California Environmental Quality Act (CEQA). The cultural resources documentation developed for the HPSR/FOE will be used to comply with the Initial Study/Mitigated Negative Declaration (IS/MND) requirements of CEQA.

2.0 LOCATION AND DESCRIPTION

The proposed Foss Creek Pathway, Segments 7 and 8, City of Healdsburg, Sonoma County is located between Grove Street on the north and about Ferrero Drive on the south if it extended west, parallel to the Northwestern Pacific (North Coast) railroad alignment/corridor (United States Geological Survey (USGS) Jimtown, Calif. 1993 [northern part]; USGS Healdsburg, Calif. 1993 [southern portion]; Township 9 North Range 9 West, unsectioned) [Figs. 1-3, APE Map].

2.1 DESCRIPTION

The City of Healdsburg has been developing the Foss Creek Pathway since 2004, but due to a variety of factors, the Pathway has not been completed. A total of five reaches covering 4.1 miles are planned: (1) Railroad Station Reach: (2) Downtown Reach; (3) Foss Creek South Reach; (4) Foss Creek North Reach; and, (5) North Healdsburg Reach.

The current project, Segments 7 and 8, will start from a connection to Segment 6 (southerly limit) and veer easterly over Foss Creek towards the North Coast Railroad Authority right of way turning and continuing north along the railroad tracks, to and across Dry Creek Road and finally terminating at Grove Street (northerly limit) west of the Healdsburg Avenue intersection.

The proposed project would be constructed in an alignment similar to the original project. Pathway features will include a 10-foot wide asphalt concrete paved pathway, decorative 175 Watt LED lighting, two creek/water crossings, fencing along the pathway, site furniture and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control. All of the improvements will be contained within existing public right of way and easements.

Segment 7

Segment 7 is a 10-foot-wide asphalt concrete paved pathway connecting northwest of Norton Slough at the terminus of the completed Segment 6 and would continue until Dry Creek Road. The connection would occur in two locations along the existing pathway that would then merge, forming a semi-circle, before connecting to a pedestrian bridge. The pedestrian bridge would be a 10-foot-wide, 60-foot-long bridge composed of installed over Foss Creek. Installation of the bridge would utilize culverts located outside of the Ordinary High Water Mark. The segment would then turn to continue north for its remaining length until terminating on the south side of Dry Creek Road. The segment will bend slightly to the west prior to ending on the south side of the Dry Creek Road. This would complete the end of the Foss Creek South Reach.

Segment 8

Segment 8 would be a 10-foot-wide asphalt concrete paved pathway that would connect on the northern side of Dry Creek Road. The pathway would switch from the west side of the rail road tracks to the east side at this point and then continue north until Grove Street. The pathway will continue in a general northern direction, but will be routed around trees to minimize tree removal. Near the middle of this segment a 10-foot-wide concrete boardwalk would be installed. The concrete boardwalk would be composed of a pre-cast concrete panel to be trucked in from an off-site location. The boardwalk would be supported by 10 steel piles installed into concrete piers and have a metal railing installed on both sides of the boardwalk. Prior to the termination of Segment 8, the pathway will be routed around a utility box.

Temporary Construction

Temporary construction access and staging will be required and will utilize the existing right of way.

2.2 AREA OF POTENTIAL EFFECTS (APE) [Fig. 3, APE Map]

The Area of Potential Effects (APE) for Archaeology includes the area within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, should any be present within the APE. The horizontal and vertical APE consists of the proposed construction within the project's right of way (ROW) including access roads to the project area and staging areas for material laydown and storage of any spoils.

The proposed project would be constructed in an alignment similar to the original project with a maximum 50-foot wide right of way (ROW). Pathway features will include a 10-foot wide asphalt concrete paved pathway, decorative 175 Watt LED lighting, two creek/water crossings, fencing along the pathway, site furniture and an enhanced safety crossing at Dry

Creek Road featuring on-demand signalized traffic control. All of the improvements will be contained within existing public right of way and easements. The horizontal APE is commensurate with the footprint of the proposed undertaking while the vertical APE is generally 2.0-5.0 feet which is the maximum depth needed to install the path base and topping, posts for the chain link fence and the concrete piers for the precast concrete pedestrian bridge and boardwalk within the wetlands just north of Segment 6 in Segment 7 (STA 1+00 to STA 2+00) and in Segment 8 (STA 33+00 to STA 34+000.

3.0 REGULATORY CONTEXT

This report has been prepared to meet applicable federal regulatory and State of California requirements for historic properties (cultural resources) which require the identification and evaluation of cultural resources that could be affected by the project. Cultural resources include prehistoric and historic archaeological sites, districts and objects; standing historic structures, buildings, districts and objects; and locations of important historic events or sites of traditional/cultural importance to various groups. The analysis of cultural resources can provide valuable information on the cultural heritage of both local and regional populations.

The City of Healdsburg, Public Works Department, as the lead local agency, is required to determine the potential impacts of the construction on both historical and archaeological cultural resources and mitigate impacts on any significant resources may be affected by the project to a less than significant effect in accordance with CEQA. The California State Historic Preservation Office (SHPO) is the final reviewing party.

3.1 FEDERAL

The proposed undertaking may require the analysis of the project in accordance with Section 404(b)(1) of the Clean Water Act (codified at 33 U.S.C. § 1344) and must comply with the regulatory requirements of the Department of the Army, Corps of Engineers (Corps) with regard to cultural resources (historic properties). The Corps (San Francisco District) is the NEPA responsible entity and is required to complete the federal regulatory requirements for cultural resources pursuant to Section 106 of the NHPA of 1966 (as amended) (54 U.S.C. § 306108) and its implementing regulations 36 CFR Part 800. The regulations require a federal agency with jurisdiction over a federal, federally assisted or federally licensed undertaking to take into account the effort of the undertaking on properties listed on or eligible for the NRHP and to afford the ACHP an opportunity to comment on the undertaking should it adversely affect a NRHP eligible or NRHP listed property. The criteria for determining NRHP eligibility are found in 36 CFR Part 60.

3.2 STATE OF CALIFORNIA

The California Register of Historic Resources (CRHR) (Public Resources Code (PRC) *Section 5024.1*) is a listing of properties that are to be protected from substantial adverse change, and includes properties that are listed, or have been formally determined to be eligible for listing in, the National Register of Historic Places (NRHP), State Historical Landmarks, and eligible Points of Historical Interest. A historical resource may be listed in the CRHR if it meets one or more of the following criteria:

(1) It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or cultural heritage of California or the United States;

(2) It is associated with lives of persons important in our past;

(3) It embodies distinctive characteristics of a type, period, or method of construction, or represents the work of a master or possesses high artistic values; or,

(4) It has yielded or has the potential to yield information important in the prehistory or history of the local area, California, or the nation.

Pertinent definitions as used in the CRHR (Title 14, Chapter 11.5, Appendix A) include:

Archeological Site - a bounded area of a resource containing archeological deposits or features that is defined in part of the character and location of such deposits or features (CAL/OHP 2001:#10:82).

Cultural Resource - see Historical Resource.

Historical Resource - any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or which is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural history of California (CAL/OHP 2001:#10:83).

Site - a location of a significant event, a prehistoric or historic occupation or activity, or a building or structure, whether standing, ruined, or vanished, where the location itself possesses historical, cultural, or archeological value regardless of the value of any existing building, structure, or object. A "site" need not be marked by physical remains it is the location of a prehistoric or historic event and if no building, structures, or objects marked it at that time. Examples include trails, designed landscapes, battlefields, habitation sites, Native American ceremonial areas, petroglyphs, and pictographs (CAL/OHP 2001:#10:86-87).

3.2A Public Resources Code

PRC *Section 21084.1* stipulates that any resource listed in, or eligible for listing in, the CRHR is presumed to be historically or culturally significant. Resources listed in a local historic register or deemed significant in a historical resources survey (as provided under PRC Section 5024.1g) are presumed historically or culturally significant unless the preponderance of evidence demonstrates they are not. A resource that is not listed in or determined to be eligible for listing in the CRHR, not included in local register or historic resources, or not deemed significant in a historical resource survey may nonetheless be historically significant. This provision is intended to give the lead agency discretion to determine that a resource of historic significance exists where none had been identified before and to apply the requirements of PRC Section 21084.1 to properties that have not previously been formally recognized as historic.

PRC *Section 21083.2* stipulates that a project that may adversely affect a unique archaeological resource requires the lead agency to treat that effect as a significant environmental effect. When an archaeological resource is listed in or is eligible to be listed in the CRHR, PRC Section 21084.1 requires that any substantial adverse effect to that resource be considered a significant environmental effect. PRC Sections 21083.2 and 21084.1 operate independently to ensure that potential effects on archaeological resources are considered as part of a project's environmental analysis. Either of these benchmarks may indicate that a project may have a potential adverse effect on archaeological resources.

A "Unique Archaeological Resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria."

(1) Contains information need to answer important scientific research questions and that there is a demonstrable public interest in that information.

(2) Has a special and particular quality such as being the oldest of its type or the best available example of its type.

(3) is directly associated with a scientifically recognized important prehistoric or historic event or person (CAL/OHP 2001:#10:30 [PRC Section 21083.2].

Thresholds of Significance

Guidance for evaluating significance thresholds is based on the CEQA Environmental Checklist (CEQA Guidelines Appendix G). Using these guidelines, the proposed project would result in a significant impact if it would:

- Cause a substantial adverse change in the significance of historical resources as defined in §15064.5
- Cause a substantial adverse change in the significance of archeological resources pursuant to §15064.5
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature
- Disturb any human remains, including those interred outside of formal cemeteries

3.3 CITY OF HEALDSBURG

The Historic and Cultural Resources Element of the 2009 *Healdsburg 2030 General Plan Policy Document* (#10) with amendments through January 2015 establishes goals and policies for identifying and preserving significant historic and Native American cultural resources. Resources include buildings and neighborhoods of historic architectural significance, places of special historic or archaeological value, and other features that have special value to the community.

HISTORIC AND CULTURAL RESOURCES GOALS, POLICIES AND IMPLEMENTATION MEASURES

GOAL HCR-A Preservation and enhancement of Healdsburg's historical heritage.

POLICIES

HCR-A-1 The City will promote the protection and enhancement of Healdsburg's historically significant districts, buildings and landscape features.

HCR-A-2 The City will support the efforts of owners of qualified properties in seeking local historic designation, listing on the California Register and/or the Federal Register of Historic Sites.

HCR-A-3 The City will support the efforts of property owners to preserve and renovate historically significant structures.

GOAL HCR-B Protection and preservation of Healdsburg's Native American cultural places.

POLICIES

HCR-B-1 The City will consult with culturally-affiliated Native American tribes prior to amending the General Plan and adopting or amending specific plans, and when a sacred site is to be placed in permanent open space, consistent with state law.

HCR-B-2 The City will work with culturally-affiliated Native American tribes to identify and appropriately address cultural resources and tribal sacred sites through the development review process.

HCR-B-3 The City will avoid or mitigate to the maximum feasible extent impacts of development on Native American archaeological and cultural resources.

HCR-B-4 The City will encourage voluntary landowner efforts to protect cultural resources and tribal sacred sites of culturally-affiliated tribes consistent with state law.

IMPLEMENTATION MEASURES

HCR-1 Maintain and update as necessary the Cultural Resources Survey per the guidelines of the State Office of Historic Preservation and the U.S. Department of the Interior in order to identify structures and districts that are historically significant at the local, state and federal level.

HCR-2 Continue to administer the Historic Overlay Zoning District.

HCR-3 Amend Healdsburg Zoning Ordinance Article 17 to require Historic Committee review of streetscape improvements within Historic Overlay Districts to ensure that they enhance and are compatible with the historic character. Streetscape features deemed to be historic shall be retained.

HCR-4 Continue to implement an historic building code, as authorized by state law.

HCR-5 Amend the Zoning Ordinance to clarify that the heritage tree protection provisions may be extended to trees or groups of trees with historic significance.

HCR-6 Develop a demolition procedure for adoption by the City Council to protect historic resources to the maximum feasible extent.

HCR-7 Maintain an agreement with the Northwest Information Center of the California Historical Resources Information System for the conduct of prehistoric and historic archaeological assessments and determinations of the prehistoric and historic sensitivity of areas for which project applications have been submitted to the City of Healdsburg.

HCR-8 Refer proposals for projects that are not categorically exempted from the California Environmental Quality Act to the Northwest Information Center for evaluation and a recommendation as to whether further study is required to determine the presence of archaeological resources. If further study is recommended, the project applicant shall contract with a qualified professional to conduct the study and make recommendations designed to avoid or minimize adverse impacts on cultural or historic resources and indicate whether further investigation is needed. All studies shall be completed and submitted to the City of Healdsburg prior to the completion of any environmental document for the project.

HCR-9 Contact the Native American Heritage Commission for a Sacred Lands File Check and a list of appropriate Native American contacts for consultation concerning projects that are not categorically exempted from the California Environmental Quality Act and to assist in the development of appropriate mitigation measures.

HCR-10 Refer draft environmental documents, including any studies and recommended mitigation measures, to the appropriate Native American tribes for review and comment as part of the public review process for such documents. Mitigation measures to avoid or minimize impacts on Native American cultural resources may include the execution of a Cultural Resources Treatment Agreement between the developer and the appropriate tribe(s) that address the treatment and disposition of cultural resources and human remains, and tribal monitoring during earth-disturbing activities.

HCR-11 Consult with culturally-affiliated Native American tribes prior to designating open space in order to protect the identity of any cultural places that exist on the proposed open space and develop a treatment plan and management plan for any such cultural places.

HCR-12 Work with culturally-affiliated Native American tribes to acquire and hold conservation easements on terms mutually satisfactory to the tribe and landowner for purposes of protecting the tribe's cultural places.

HCR-13 Require plans for grading and building permits that propose the disturbance of soil to include a note that requires the permit holder to notify the

City if archaeological resources are discovered during construction in order to identify and evaluate the resources, if appropriate.

4.0 BACKGROUND REVIEW

Healdsburg is located in northern Sonoma County approximately 12 miles north of the City of Santa Rosa, the county seat (Healdsburg 2009/2010). The Town of Windsor is four miles to the south, the small unincorporated community of Geyserville is located approximately eight miles to the north, and the City of Cloverdale is located approximately 18 miles to the north. Healdsburg is just beyond the northern edge of the intense urban development that has occurred along the State Highway 101 corridor in Sonoma County.

Geographically, Healdsburg is within an inland valley defined principally by State Highway 101, the Russian River, surrounding agricultural lands, and mountains to the east and west. State Highway 101 is the principal coastal route between San Francisco and the Oregon border. The Russian River flows through Healdsburg on its way to the Pacific Ocean, approximately 20 miles to the west. The city is at the intersection of three rich agricultural valleys - Russian River Valley, Dry Creek Valley and Alexander Valley - and is between 100 to 430 feet above sea level. East and west beyond the agricultural lands, subsystems of the Coastal Mountain Range are present.

Wet winters and dry summers characterize the region's inland Mediterranean-type climate with an average annual high of 75°F and an average minimum of 47°F. Rainfall totals can vary widely over a short distance; windward mountain areas west of Healdsburg can receive more than 60 inches of rain, while shadow areas, such as the city proper, receive about 40 inches annually.

Historically, Healdsburg has served as an agricultural service center and a milling and distribution center for north coast lumber. More recently, the development of tourist-related businesses such as overnight accommodations, specialty retail, restaurants and wine tasting has diversified the local economy.

4.1 NATIVE AMERICAN - Prehistoric

Cultural resources are traces of human occupation and activity. Native American occupation and use extend back in time for at least 9000-11,500 and possibly longer in northern and central California. The project is located within an environmentally advantageous area for Native Americans and would have provided a favorable environment during the prehistoric period with coastal, riparian and inland resources readily available along the Russian River and numerous creeks in the general study area. Habitation sites in the study area appear to have been selected for accessibility, protection from seasonal flooding, and the availability of both food and tool resources.

Archeological information for the general central California area suggests a slow steady increase in the prehistoric population over time with an increasing focus on permanent settlements with large populations in later periods. This change from hunter-collectors to an increased sedentary lifestyle is due both to more efficient resource procurement as well as to a focus on staple food exploitation, the increased ability to store food at village locations, and the development of increasing, complex social and political systems including long-distance trade networks.

Prehistoric site types recorded in the general study area consist of lithic scatters, quarries, village/habitation sites (including bedrock mortars [BRMs], burials), bedrock mortars or other milling feature sites, and petroglyph sites.

Native American occupation within the North Coast Ranges have been placed in five patterns defined by archaeological data as the Post, Borax Lake, Mendocino, Berkeley, and Augustine Patterns based on an extensive archaeological program at Anderson Flat in the Clear Lake Basin (White et al. 2002:49-52 after Fredrickson 1973, 1974, 1984; White and Fredrickson 1992).

> **Post-Pattern** (Paleo-Indian Period – ca. 10,000-11,500 BP); Fluted Point Tradition, apparently hafted and used as a dart with an atlatl (spear thrower). Chipped stone crescents (possibly knives or transversely hafted projectile points used to hunt waterfowl); assume hunting and plant gathering; no known milling equipment or associated fauna.
>
> **Borax Lake Pattern** (Lower Archaic Period – 7500-10,000/10,500 B.P; square-stemmed projectile points and milling equipment (milling slab and handstone); Borax Lake Aspect with fluted, square-stemmed Borax Lake wide-stemmed points, formed flake tools, and large, thin bladelet flakes.
>
> **Mendocino Pattern** (Middle to Upper Archaic and possibly into the Emergent Periods – 1200-4500 B.P.). Two aspects: northern Mendocino and southern, Hultman converging in Clear Lake Basin. Notched, concave-based (Mendocino Aspect) and thick leaf-shaped projectile points (Hultman Aspect); milling assemblages (shaped and cobble pestles and cobble mortars, mostly handstones and milling slabs); basalt core tools, thin, finely flaked obsidian knives, shaped unifaces and heavily worked bifaces); chert (Mendocino Aspect), local and nonlocal obsidian (Hultman Aspect); Hultman Aspect also characterized by ovate scrapers, simple flake tools, incised and drilled soapstone plummets, rock features (hearths), cached artifacts, and burials (some with associations).
>
> **Berkeley Pattern** (Middle to Upper Archaic – 1200-7000 B.P.) generally in lowland valleys in the North Coast Ranges (including the Russian and Napa valleys) and also north and west of Clear Lake estimated to postdate 2500 B.P. (southern Geysers, Lake Sonoma, Mendocino County Coast); mortuary features rare in North Coast Ranges, burials with fewer associated artifacts; highly developed bone tool industry (needles, whistles, serrated scapula "saws," hairpins, spatulae, tubes, etc.); fishing, atlatl, dart-sized projectile points, with predominate non-stemmed obsidian projectile points; unique diagonally flaked obsidian, concave-based and non-stemmed projectile points, often with burials; baked clay artifacts as well as Tule and basketry impressions on clay; infrequent handstones and milling slabs with high frequency of mortars and pestles suggestive of acorn processing. Houx Aspect in Clear Lake Basin from Borax Lake Pattern (ca. 7000 B.P.) to Clear Lake Aspect transition (at 1500 B.P.) with Excelsior and wide-stemmed projectile points, Clear Lake obsidian, *Olivella* and *Macoma* shell beads,

bowl mortars and pestles, serrated flake tools, often associated with dark midden soils. Pattern is interpreted as indicating strong interaction with Central California.

Augustine Pattern (Recent-1650 B.P. [Historic Contact Period]), arrival of bow and arrow with small, chipped stone projectile points; pre-interment grave pit burning with flexed burials and cremation presumed reserved for high status individuals; first appearance of *Olivella*, clamshell disk beads, magnesite cylinders, and "banjo" type *Haliotis* ornaments; incised bird bone whistles and tubes, and "flanged" steatite pipes; baked clay balls for cooking; basketry, "form of pottery" in sites in the central valley; Clear Lake Aspect (ca. 150-1500 B.P.) with marker - Rattlesnake Corner-Notched projectile points; clam disc beads and bead drills, magnesite cylinders, bedrock mortars, and "houses pits ascribable to ethnographic villages"

General overviews and perspectives on the regional prehistory including chronological sequences can be found in C. King (1978), Elsasser (1978), Wallace (1978) and Jones and Klar (2007). Moratto (1984) includes a general cultural sequence charge, a discussion of various important archaeological sites and an areal synthesis on the North Coast Region. Bennyhoff (1994) provides a particularistic synthesis on *The Napa District and Wappo Prehistory*. Hildebrandt (2007) provides an explanation and reduction of the general time periods for northwestern California.

Linguistic data suggests that Pomoan groups initially settled the Clear Lake region and radiated out toward the Russian River Valley sometime after 3000 B.C and possibly as late as 500 B.C. (Whistler 1980 in Moratto 1984:510). Data from the Warm Springs Dam Project, located to the east of the proposed project site, postulates a ca. 2500 B.P. starting date for the Pomoan occupancy of northern Sonoma County (Basgall 1982:17).

4.2 NATIVE AMERICAN - Ethnographic

The City of Healdsburg is located in Southern Pomo or *Gallinomero* territory). The Southern Pomo are one of seven Pomo groups of the Hokan Language family which speak seven "distinct and mutually unintelligible languages" (Barrett 1908; Kroeber 1925:233; McLendon and Oswalt 1978). Each tribelet or autonomous village resided in a specific area, "often spoke a distinct dialect, and was organized under one or more headmen." (Stewart 1981). Permanent (winter) occupation sites were often located at the confluences of streams in the valleys and at the base of the hills (S. Stewart 1982).

The project site is within an area with a number of Native American villages (see Barrett 1908). Kroeber (1925:233) states that "On lower Dry Creek and on Russian River in the vicinity of Healdsburg a great number of villages have been recorded, but their grouping is entirely obscure. Pomo Indian villages "fairly covered the land" of the historic Sotoyome Rancho (Tuomey 1926(1):120). The "Dry Creek Valley Area", approximately 8,765 acres that includes tributaries of Cherry, Yorty, and Warm Springs creeks and is "one of the traditional homes of the Pomo Indians" is a State of California American Indian Ethnic Site #20 (CAL/OHP 1988:49-51).

Ethnographic research has also noted the presence of numerous prehistoric trails, especially along both sides of the Russian River as well and various creeks in the general study area.

McLendon and Oswalt (1978:280) list a “selection of the more prominent place-names” and include three in reference to Healdsburg. The old village of "*ka'le*" - from the *aka*, water the *le* or *li*, place” – is located within the vicinity of the Healdsburg plaza/town square.[1] Stewart (1943:53) also provides a description of the *Kataictemi* of Healdsburg [e.g., *Gallinomero*] stating that they were centered about *Kale* with a total area of estimated as about 200 square miles that included zones of redwood, valley, and deciduous forest of Fitch Mountain.[2] Stewart (1943) also maps a north/south trail through Healdsburg and a trail to Stewarts Point on the coast from Cloverdale (north of Healdsburg).

The village closest to the proposed Foss Creek Pathway project and within 0.25 miles of the project was “*baca’klekaū*, from *baca*’, buckeye, kalé, and *īkaū*, bursted or broken, at the point about a mile north of Healdsburg [ca. 1908] where the roads leading to Lyttons [*sic*; north of Healdsburg] and to Dry creek diverge.” (Barrett 1908:219). The placement of this old Southern Pomo village appears to be located in the vicinity of Segment 7 and Segment 8 depending on historic maps from the 1870s.

The Southern Pomo, especially the southern part of their territory, were decimated early by missionization, Mexican incursions and settlement as well as slave raids, disease, and later displacement from traditional lands and settlement by Anglo-Americans (see McLendon and Oswalt 1978:279).

At least 600 Pomo were baptized at Mission San Francisco de Solano (established 1823) and at Mission San Rafael Arcangel (established 1817). Thousands of Pomos were captured or died during various Mexican campaigns including slave raids between 1834-1847. By 1838 all southern and central Pomo territory was either settled or about to be settled by Mexicans. In 1833, cholera (or possibly malaria) devastated many Pomo villages and later in 1838-1839 thousands died of smallpox. The Pomo provided a principal source of cheap agricultural labor during the American Period working in orchards as fruit pickers, hop pickers, and grain fields as reapers during the planting and harvest seasons. During the winter they continued a more traditional lifeway - hunting, fishing, trapping and forms of aboriginal ceremonies (McLendon and Oswalt 1978:299; Hart 1987:234).

4.3 HISTORIC ERA - Hispanic Period

The Spanish philosophy of government in northwestern New Spain was directed at the founding of presidios, missions, and secular towns with the land held by the Crown (1769-1821), while the later Mexican policy stressed individual ownership of the land. After the secularization of the

1. Stewart (1943:Appendix I, also lists Kale as the main village of a 170 square mile territory. The former village site, ka'le appears to correspond to CA-SON-1391, the Healdsburg Plaza site (Garaventa 1983).

2. For example, the Southern Pomo "old village" site, *watakka'w*i has been identified from ethnographic sources as "now covered by the Healdsburg cemetery" (Barrett 1908:218). This cemetery, known as the Oak Mound cemetery,

missions by Mexico in 1833, vast tracts of the mission lands were granted to individual citizens (Hart 1987).

As early as 1810, Gabriel Moraga led an expedition to investigate the presence of Russians north of San Francisco Bay. In addition to finding three streams - the *Laguna* Santa Rosa, and the Santa Rosa and Russian rivers - the Moraga party "passed the plain of San Francisco Solano" upon which the last and most northerly of the chain of 21 missions of Alta California, Mission San Francisco Solano (de Sonoma), was founded. Mission San Francisco Solano was founded July 4, 1823 in the present town of Sonoma and would have been the mission with the greatest impact on the Native Americans within the vicinity of the project. As the only mission established during the Mexican Period, it not only served as a focus for the Christianization and acculturation of Native Americans, but as an outpost against the Russians. The Mission was expected to raise enough surplus crops and livestock for Missions San Francisco de Asis and San Rafael (Beck and Haase 1974; Hart 1987).

The Russians made forays from their Alaska territory along the coast of western North America. These included journeys as far south as San Francisco in 1806; to Bodega Bay for trade and hunting in 1808 and 1811; and, the founding of Fort Ross as a trading center in 1812 on the Sonoma coast. For the Russians, Fort Ross was an important outpost for agriculture and livestock raising to provision ship crews with any surplus used for trade. Even the Spanish traded with the Russians at Fort Ross for "Russian cloth, agricultural tools and other hardware items, candles, and even furniture." The very name of "Russian River" used for both the river and a post office reflects the presence of Russian fur traders (Beck and Haase 1974:#41; Hart 1987:423; Gudde 1998:323-324).

In 1835, General Mariano Guadalupe Vallejo was entrusted with the selection of a site for a town or pueblo as part of the concerted efforts to thwart the infiltration of Russian traders into Mexican territory. The location of the present town of Sonoma was chosen as a result of the climate, soil, and "beauty" of the setting (Menefee 1873:256). The Sonoma Barracks, built in 1837, also served as the headquarters of the United States Military Garrison from 1846/1847 to 1851 (Beck and Haase 1974; Miller 1967:5). In part, the Russians were a threat due to a "wise Indian" policy and "efficient military preparation" (Hansen and Miller 1962:26). This policy differed from the Hispanic efforts to transform the native populations into essentially Christian peasants. A relatively short time later, in 1841, The Russian-American Company sold all of its interests to John Augustus Sutter for $30,000 because of "a lack of support from Russia". At this time, Sutter was the unofficial rival of the Vallejo family (see Hart 1987:423, 508).

The project is within the *Rancho Sotoyome*. The original grant of Sotoyome or "Valley of Flowers" consisted of three square leagues (13,312 acres) granted to Henry Delano Fitch on September 28, 1841 (Hendry and Bowman 1940:253). Three years later, Governor Manuel Micheltorena granted another eight square leagues to Fitch (35,509 acres). By the time the *Rancho Sotoyome* was patented by his widow Josefa Carrillo de Fitch on April 3, 1858, the rancho covered of 48,836.51 acres. None of the known buildings and features associated with the *rancho* were located in the vicinity of the project (Cage 1857 [plat]; Hendry and Bowman 1940:253-259 and Map of Sonoma County; Hoover et al. 1966:533-534).

4.4 HISTORIC ERA - American Period

California became a United States territory in 1848 through the Treaty of Guadalupe Hidalgo that ended the Mexican War of 1846-1847. California was not formally admitted as a state until 1850. Beginning in the mid-19th century, most of the rancho and pueblo lands were subdivided as a result of population growth, the American takeover, and the confirmation of property titles. The initial population explosion in California was associated with the Gold Rush (1848), followed later by the construction of the transcontinental railroad (1869) and later, regional carriers. Still later, European immigration and the development of a prosperous agricultural pursuits had an impact on population growth in the area. Until about World War II, Sonoma County was dominated by an agricultural or rural land-use pattern (Hart 1987).

Healdsburg is located with Mendocino Township, about 15 miles north of Santa Rosa. It was initially located within Mendocino County, a county administered by Sonoma County from 1850-1859. Both counties were two of the original 27 counties created by the California State legislature in 1850. The Sonoma County seat was located at Sonoma from 1850 to 1854 and has been at Santa Rosa since 1854. The boundary modification relevant to the Foss Creek Pathway occurred in April 1859 (Finely 1937:206; Hoover et al. 1966; Coy 1973).

The Town of Healdsburg was located in the area known as "Poor Man's Flat" (Menefee 1873:254) and was named after Harmon Heald who in 1846 established a trading post to supply hunters, trappers and herders. According to another, slightly conflicting source, the Heald Brothers originally "settled in the area north of the present city" in 1850; in the following year, 1851, Harmon Heald is credited with building a cabin, farming eight more or less acres and opening a general store near the plaza (Walt Smith and Associates 1981:70 [hereafter WSA]). Apparently Harmon Heald was a squatter within the *Rancho Sotoyome,* but prospered to the extent that a post office opened in Heald's store/trading post about 1854 to 1856 and other business were started (WSA 1981:70). The "Russian River" post office, named after the Russian fur trappers active in the area from 1812-1842, was established November 1, 1854 with Harman G. Heald, Postmaster. The name was changed to "Healdsburgh",[3] on April 14, 1857 (Patera 1991).

In 1856, Heald purchased a portion of the Fitch Estate at a tax auction and in 1857 "A map was filed for the 'Healdsburg' subdivision, which platted the present-day streets and Plaza of the downtown Area" (WSA 1981:70). The town of "Healdsburg" was mapped and recorded by Harmon Heald on March 5, 1857[4] (HealdsburgP&B 2009/2015:18). By November 20, 1857, the population of Healdsburg reached 500 (R. Thompson 1877:89), though when Heald died in 1858 a "land boom" ensued "as the subdivision lots were sold for $15 each (WSA 1981:70). The years 1862-1862 were marked by excitement about the discovery of rich silver bearing ore near Healdsburg. The search and claims for both copper and silver ore continued into 1864 and 1865, but essentially ceased in 1865 because of the poor quality of the ore and costs incurred for smelting and transport (Menefee 1873:276-277).

3. The town dispensed with the final "h" in 1896.

4. Alternatively by H.P. Mock in the spring of 1857 (Finely 1937:207).

The Town of Healdsburg was incorporated in 1867 under existing state law and again by vote of the citizen's of Healdsburg in April 1874 (Finely 1937:207). By 1874, the current city incorporation charter was in effect; and by 1877 the town contained 2,500 residents (R. Thompson 1877:89). The growth of Healdsburg is reflected in the Thompson map of 1877 which includes the railroad tracks through the westernmost blocks of Healdsburg and documents the expansion of the city limits that extended as far north as Powell Avenue (T.H. Thompson 1877:64). Historically, Healdsburg served as an agricultural service center and a milling and distribution center for north coast lumber. Contemporary Healdsburg has been a "center for grape growing, lumbering, shipment of hops and fruits, and site of the world's largest geothermal generating plant for the nearby Geysers" (Hart 1987:211; HealdsburgP&B 2009/2015).

Regional Rail Service

In early 1872, the California Pacific Railroad Company began service between Santa Rosa, Healdsburg, and Cloverdale to the north (Menefee 1873:323).

> This town [Healdsburg] is the natural trade center of a very large and fertile area of country. The rich and extensive valleys of Russian River and Dry Creek surround it, while Knight's Valley lies to the East. All the travel to Skaggs Springs, and a great part of that to the Geysers, passes through here. Since the completion of the railroad the town has greatly increased, both in population and in material wealth (Menefee 1873:262).

Access to rail transport was a major component of the growth in the general study area and northwestern California. The alignment of the former San Francisco & North Pacific Railroad Company (SF&NP) Railroad Company[5] is adjacent to the APE. The railroad, incorporated in 1869, was sold to the California Pacific Railroad in April 1871 and by August of that same year came under the control of the Central Pacific Railroad (CPRR). It reached Cloverdale in April[6] 1872 in order to qualify for a government subsidy and remained as the head of track for 16 years.[7] Shortly thereafter, the rail road was repurchased by the SF&NP in January 1873. The SF&NP was leased to the California Northwestern Railroad on March 17, 1899 and consolidated into the newly incorporated Northwestern Pacific Railroad Company (NWP) on January 8, 1907. The company was listed in 1911 as an operating subsidiary of The Atchison, Topeka & Santa Fe Railway Company. By 1922, it was independent, but in 1929 the company was an operating subsidiary of Southern Pacific Company. The NWP was merged into the Southern Pacific Transportation Company in October 1, 1992 and was later absorbed into the Union Pacific Railroad (UPRR) in 1996 (Adams 1980; Fickewirth 1992; Robertson 1998; Walker 1994:Maps CA-10, 11; Jones & Stokes 2000).

---

5. As the SF&NPRR on Thompson (1877:48). Variously known as the SF&NP Railroad Company and later known as SJ&NP Railway Company incorporated in November 1869 (Fickewirth 1992:128); as incorporated December 1888 following Robertson (1998:208).

6. Rails to Cloverdale in March, first train in April (Adams after Stindt and Dunscomb 1964).

7. Until construction to Hopland, 14.5 miles north, was completed in 1888 (Robertson 1998:110).

The North Coast Railroad Authority (NCRA), formed in 1989, purchased the rail line from Willits (north of Healdsburg) to Healdsburg and negotiated a perpetual easement to operate rail freight service as the North Coast Railroad (NCRR) between Healdsburg and Lombard (Napa County)[8] (Kleinfelder 2009). The Southern Pacific Transportation Company (SPTC) began to lease the tracks of the former NWP to the California Northern Railroad (CNRR) in 1993, until the entire south end was purchased by a consortium of the GGBHTD (Golden Gate Bridge, Highway and Transportation District) and Marin and Sonoma counties. In 1996, the NCRA and the NWP merged and formed a public entity, the Northwest Pacific Railroad.

The NCRA operated the "new" NWP from 1996 until 1998 when it was closed by the Federal Railroad Administration due to operational and financial difficulties. The NWP reopened the alignment from Willits and Novato (Marin County) in January 2001 but due to insufficient capital service was discontinued in September. The NCRA selected and approved a new operator in 2006, the Northwestern Pacific Railroad Company (NWP Co.) for the 271 mile long rail line from Eureka to Schellville (south of Healdsburg).

The Sonoma Marin Area Rail Transit District [SMART], created in 2003, owns the segment from Healdsburg to Lombard. SMART passenger rail service and NCRA freight service both use the tracks under an Operating Agreement (Kleinfelder 2009). SMART passenger trains began service between the Sonoma County Airport and the City of San Rafael with bus connections to the Larkspur Ferry landing (Marin County) and the City of Cloverdale (north of Healdsburg) in late Spring 2017. Limited freight service between the City of Napa and the Town of Windsor started in June 2011.

Foss Creek

Foss Creek, located just east of the NCRA rail alignment/track appears to have been named after Clark Foss (ca. 1819-1885), a prominent local resident and "world famous" stagecoach driver who settled in Healdsburg about 1859. He focused on the Geysers[9] stage route from the early 1860s until 1881. He also founded "Fossville" located about eight miles from Healdsburg in the southeastern end of Knights Valley. His son, Charles C. Foss, continued running the Calistoga-Geysers stage line - including Healdsburg - until at least 1910 (Clayborn 2003-2007).

5.0 PRE-FIELD IDENTIFICATION EFFORT

A prehistoric and historic site record and literature search was completed by the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert Park (CHRIS/NWIC File No. 17-2138 dated March 21, 2018 by Neal). Specialized listings for cultural resources consulted include:

8. The southern portion of the rail corridor proceeds from Ignacio Wye in Napa County northeast to Schellville in Sonoma County, and then southeasterly to Lombard in Napa County (Kleinfelder 2009:Fig. ES-1; Wikipedia 2018).

9. Located 25 miles northeast of Healdsburg (Hoover et al. 1966:531).

- *National Historic Landmarks* (NHL) and *National Register of Historic Places* (NRHP) listings in Sonoma County, California (USNPS 2015/2017).
- *Historic Properties Directory* (HPD)for Healdsburg**,** Sonoma County (CAL/OHP 2012a).
- *Archeological Determinations of Eligibility for Sonoma County* (ADOE) CAL/OHP 2012b).
- *California History Plan* (CAL/OHP 1973).
- *California Inventory of Historic Resources* (CAL/OHP 1976).
- *Five Views: An Ethnic Sites Survey for California* (CAL/OHP 1988).
- *California Historical Resources –Sonoma County* [including National Register, State Landmark, California Register, and Point of Interest] **(**CAL/OHP 2018).
- Local lists, inventories and plans: *Healdsburg 2030 General Plan Background Report* **(**Healdsburg Planning & Building Department **[**HealdsburgP&B] 2009/2010); *Healdsburg 2030 General Plan Policy Document* (HealdsburgP&B 2009/2015); and, *Public Draft Environmental Impact Report North Coast Railroad Authority Russian River Division Freight Rail Project* (Kleinfelder 2009).
- Limited map review (Cage 1857; Goddard 1857; Barrett 1908; Hendry and Bowman 1940; Thompson 1877; Bell & Heymans 1888; United States, Army Corps of Engineer (US/ACE) 1915; USGS Jimtown 1957, 1993, Healdsburg 1980, 1993).

The Native American Heritage Commission (NAHC) was contacted in regard to resources listed on the Sacred Lands Inventory **(**Busby 2018a). Letters were sent to eight knowledgeable Native American individuals/organizations identified by the NAHC (Busby 2018b-i) (see Attachments).

No other agencies, departments or local historical societies were contacted regarding landmarks, potential historic sites or structures.

5.1 RECORDS SEARCH RESULTS (see Tables 1-2)

The records review found:

- 28 cultural resources reports or studies within or adjacent to the APE and 18 reports or studies within 0.25 miles (Table 1).
- No prehistoric resources within or within 0.25 miles of the APE (Table 2)
- No historic resources within the APE (Table 2)
- 3 historic resources adjacent to the APE - one determined eligible for the NRHP (Table 2)
- 7 historic resources within 0.25 miles of the APE (Table 2)

5.1A Compliance Reports

In general, the cultural reports within the APE focus on fiber optic cable installation by AT&T and Williams Communications along the railroad right of way; numerous studies associated with the Santa Rosa Geysers Recharge Project pipeline with several NRHP eligibility determinations including the Northwestern Pacific Railroad; the Sonoma Marin Rail Transit Project (SMART); and, portions of previous Foss Creek Pathway segments.

TABLE 1[10]

Studies In/Adjacent To or Within 0.25 Miles of the Project APE

Report #	Author	Date	Title	Study Type	Comments	Resources
In or Adjacent						
S-005799	Peter M. Banks	1983	An Investigation of the Cultural Resources of the Retention Pond for the Foss Creek Drainage Improvement Project, City of Healdsburg, Sonoma County, California	Archaeological, Field study	Negative	None
S-009741	Thomas M. Origer	1988	An Archaeological Survey of the Vercelli School Site, Healdsburg, Sonoma County, California	Archaeological, Field study	Negative	None
S-010496	Sharon A. Waechter	1989	An Archaeological Survey of the AT&T Fiber Optics Cable Route from East Windsor to Cloverdale Peak, Sonoma and Mendocino Counties, California	Archaeological, Field study	Several resources outside of the project area	None
S-013217 Voided - S-13399 S-13400 S-13401	Thomas M. Origer	1990	An Archaeological Survey for the AT&T Fiber Optics Cable, San Francisco to Point Arena, California	Archaeological, Field study	Several resources outside of the project area	P-49-002834 (SON-2322H)
S-013217a	Thomas M. Origer	1990	Archaeological Findings Regarding a Selection of a Route through Novato for the AT&T Fiber Optics Cable (letter report)	Archaeological, Field study	Several resources outside of the project area	
S-013217b	Thomas M. Origer	1991	An Archaeological Study of Revised Portions of the AT&T Route near Santa Rosa and Sausalito (letter report)	Archaeological, Field study	Several resources outside of the project area	
S-013217c	Thomas M. Origer	1991	Archaeological Study of AT&T Revised Fiber Cable Routes (letter report)	Archaeological, Field study	Several resources outside of the project area	
S-013217d	Thomas M. Origer	1992	Archaeological Survey of Alternative Fiber Optics Cable Routes, Point Arena (letter report)	Archaeological, Field study	Several resources outside of the project area	
S-022483 Voided - S-22666 S-48535	Christian Gerike and Sara E.P. Gillies	2000	Plan for Evaluation of Cultural Resources, Santa Rosa Geysers Recharge Project, Sonoma County, California	Archaeological, Architectural/ historical, Management/ planning	Numerous resources outside of the project area	P-49-002696 P-49-002834 P-49-003014
S-022483a	Dina Coleman, Lorinda Miller, Curt Duke, Loyd Sample, Michael Newland, D. Gadsby, Noelle Storey, J.Longfellow, B. Gassner, and Christina Gerike	2000	Volume One: Cultural Resources Survey Report, the Santa Rosa Geysers Recharge Project, Alternative Alignments, Sonoma County, California	Archaeological, Architectural/ historical, Field study	Numerous resources outside of the project area	

10. Reports not cited in references.

TABLE 1, con't

Studies In/Adjacent To or Within 0.25 Miles of the Project APE

Report #	Author	Date	Title	Study Type	Comments	Resources
In or Adjacent, con't						
S-022483b	Dina Coleman, Lorinda Miller, Curt Duke, Loyd Sample, Michael Newland, D. Gadsby, Noelle Storey, J.Longfellow, B. Gassner, and Christina Gerike	2000	Volume Two: Maps: Cultural Resources Survey Report: The Santa Rosa Geysers Recharge Project, Alternative Alignments, Sonoma County, California	Archaeological, Architectural/ historical, Management/ planning	Numerous resources outside of the project area	
S-022483c	Dina Coleman, Lorinda Miller, Curt Duke, Loyd Sample, Michael Newland, D. Gadsby, Noelle Storey, J.Longfellow, B. Gassner, and Christina Gerike	2000	Volume Three: DPR523 Forms Cultural Resources Survey Report: The Santa Rosa Geysers Recharge Project, Alternative Alignments, Sonoma County, California	Archaeological, Architectural/ historical, Management/ planning	Numerous resources outside of the project area	
S-022483d	Christian Gerike	2003	Cultural Resources Activities for 2002, Santa Rosa Geysers Recharge Project, Sonoma County, California (LSA Project # SRS930 Task 9, OHP # EPA 000125A)	Archaeological, Architectural/ historical, Management/ planning	Numerous resources outside of the project area	
S-022483e	Knox Mellon	2002	RE: EPA000125A; Submittal of 2000 and 2001 Cultural Resource Activity Reports for the Santa Rosa Geysers Recharge (SRGR) Project, Sonoma County, California	OHP Correspondence	Numerous resources outside of the project area	
S-022736	Jones & Stokes Associates, Inc.	2000	Final Cultural Resources Inventory Report for Williams Communications, Inc., Fiber Optic Cable System Installation Project, Point Arena to Robbins and Point Arena to Sacramento, California: Volume I	Archaeological, Architectural/ historical, Field study, Management/ planning	Numerous resources outside of the project area	P-49-002834
S-022736a	Jones & Stokes	2000	Volume II Project Maps: Final Cultural Resources Inventory Map Atlas for the Williams Communications, Inc. Fiber Optic Cable System Installation Project, Point Arena to Robbins and Point Arena to Sacramento, California	Management/ planning	Numerous resources outside of the project area	
S-022736b	Jones & Stokes	2000	Volume III Technical Appendices: Final Cultural Resources Inventory Report for the Williams Communications, Inc. Fiber Optic Cable System Installation Project, Point Arena to Robbins and Point Arena to Sacramento, California	Management/ planning	Numerous resources outside of the project area	
S-024601	Sara Palmer	2002	National Register Eligibility Evaluation of P-49-002696, a Pumphouse in Healdsburg, Sonoma County, California. Healdsburg Central Segment, Mid-Section, Santa Rosa Geysers Recharge Project. LSA Project #SRS930 Task 14; OHP #EPA000125A (letter report)	Architectural/ historical, Evaluation, Field study	Pumphouse Includes NRHP evaluation	P-49-002696

TABLE 1, con't

Studies In/Adjacent To or Within 0.25 Miles of the Project APE

Report #	Author	Date	Title	Study Type	Comments	Resources
In or Adjacent, con't						
S-025066	Pamela Bowler	2002	Supplemental Cultural Resources Survey, Healdsburg Central Segment, Sonoma County, California	Archaeological, Field study	Pumphouse; Northwestern Pacific Railroad	P-49-002696, P-49-002834 (SON-2322H)
S-025104	Sara Palmer and John Kelley	2002	City of Santa Rosa, Santa Rosa Geysers Recharge Project: Determination of Effects and Plan for Avoidance of Adverse Effects for P-49-002834, a Section of the Northwestern Pacific Railroad, Healdsburg, Sonoma County, California	Architectural/ historical, Field study	Pumphouse; Northwestern Pacific Railroad	P-49-002696, P-49-002834 (SON-2322H)
S-025104a	Sara Palmer and John Kelley	2002	National Register Eligibility Evaluation of a Section of the Northwestern Pacific Railroad, Near Healdsburg, Sonoma County, California	Architectural/ historical, Evaluation, Field study		
S-025217	Sara E. Palmer	2002	National Register Eligibility Evaluation of a Section of the Northwestern Pacific Railroad Near Healdsburg, Sonoma County, California	Archaeological, Evaluation, Field study	Pumphouse; Northwestern Pacific Railroad	P-49-002696, P-49-002834 (SON-2322H)
S-028098	Joy Longfellow and Christian Gerike	2004	Cultural and Paleontological Resources Monitoring 2000-2003 The Geysers Recharge Project, Sonoma County, California	Archaeological, Field study, Monitoring	Numerous resources outside of the project area	P-49-002834 P-49-003014
S-031737 Voided - S-31738	Carole Denardo and Daniel Hart	2004	Archaeological Resources Technical Report for the Sonoma Marin Rail Transit (SMART) Project, Sonoma and Marin Counties, California	Archaeological, Field study	Numerous resources outside of the project area Northwestern Pacific Railroad; Buried concrete wall	P-49-002834, P-49-003014, P-49-002273 and P-49-002275 are within ¼ mile
S-031737a	Garcia and Associates	2004	Historic Architectural Resources Technical Report for the Sonoma Marin Area Rail Transit (SMART) Project	Architectural/ historical, Evaluation, Field study		
S-038966	Janine Loyd	2012	Archaeological Survey Report Foss Creek Pathway Segment 6 Project, Healdsburg, Sonoma County, California 04-SON-0-HLBG, CML-5027 (13)	Archaeological, Excavation, Field study	Negative	None
S-038968	Janine Loyd	2012	Historic Property Survey Report Foss Creek Pathway Segment 6 Healdsburg, Sonoma County, California, CML 5027 (013)	Archaeological, Field study	Negative	None
S-038968a	Janine Loyd	2012	Archaeological Survey Report, Foss Creek Pathway Segment 6 Project, 04-SON-0-HLBG, CML-5027 (013), Sonoma County, California	Archaeological, Field study	Negative	None

TABLE 1, con't

Studies In/Adjacent To or Within 0.25 Miles of the Project APE

Report #	Author	Date	Title	Study Type	Comments	Resources
Within a 0.25 mile radius						
S-000688	David Chavez	1977	An Archaeological Evaluation of a 91 Acre Parcel North of Healdsburg in Sonoma County, California (letter report)	Archaeological, Field study	Negative	None
S-002089	Thomas M. Origer	1980	An Archaeological Survey of the Proposed Amity Project Site, Healdsburg, Sonoma County, California.	Archaeological, Field study	Negative	None
S-009557	Albert J. Villemaire	1988	An Archaeological Investigation of 15 acres (A.P.N. 002-470-21, -29, -32, -35, and 002-480-12) located in Healdsburg, Sonoma County, California	Archaeological, Field study	Negative	None
S-009948	Albert J. Villemaire	1988	An Archaeological Investigation of six parcels totaling approximately 179 acres within "The Ridge" development north of Healdsburg, Sonoma County, California	Archaeological, Field study		P-49-002172, P-49-002173
S-010982	Allan G. Bramlette and Raymond J. Benson	1989	An Archaeological Study for the City of Healdsburg, North Area A, Specific Plan EIR, Sonoma County, California	Archaeological, Field study	One additional resource outside of the project area	P-49-002172, P-49-002173, P-49-002273, P-49-002275
S-012517	Thomas M. Origer	1991	An Archaeological Survey of the Joseph Kase Property, 801 Healdsburg Avenue, Healdsburg, Sonoma County, California	Archaeological, Field study	Negative	None
S-019685	Vicki R. Beard	1997	A Cultural Resources Study of a 6-acre Parcel on Grove Street, Healdsburg, Sonoma County, California	Archaeological, Field study	Negative	None
S-020374	Katherine Flynn	1997	A Cultural Resources Evaluation of a Proposed Multifamily Development Project Located along Grove Street South of Chiquita Road, Healdsburg, Sonoma County, CA	Archaeological, Field study	Negative	None
S-030294	John Holson	2005	Archaeological Survey of Lytton Cell Site (922-62), Sonoma County (letter report)	Archaeological, Field study	Negative	None
S-030952	Sally R. Evans	2005	A Cultural Resources Evaluation of the Proposed Grant Street Village, Located at 75 Grant Street and 721 / 727 Healdsburg Avenue, Healdsburg, Sonoma County, California	Archaeological, Field study	Negative	None
S-030952a Voided - S-34754	Sally Evans	2007	ARS 07-071: A Pre-Construction Meeting and Spot Check Conducted for the Grant Street Village Project, Healdsburg, Sonoma County, CA (letter report)	Archaeological, Field study	Negative	None

TABLE 1, con't
Studies In/Adjacent To or Within 0.25 Miles of the Project APE

Report #	Author	Date	Title	Study Type	Comments	Resources
Within a 0.25 mile radius, con't						
S-031218	Eileen Steen and Thomas M. Origer	2005	An Archaeological Survey of the Property at 100 Chiquita Road, Healdsburg, Sonoma County, California.	Archaeological, Field study		P-49-003699
S-031352	Kari Jones	2006	Archaeological Survey of Lytton Cell Site, Sonoma County. (Clayton Project No. 70-06571.00; PL. No. 922-127) (letter report)	Archaeological, Field study	Negative	None
S-032183	Janine M. Loyd and Vicki R. Beard	2006	Documentation of the House at 100 Chiquita Road, Healdsburg, Sonoma County, California	Architectural/ historical, Field study		P-49-003699
S-034197	Risa Huetter	2007	Archaeological Survey Report for APN's 002-033-030 and 031, Approximately 1 Acre near Healdsburg, Sonoma County, California	Archaeological, Field study	Negative	None
S-034328	Sandra A. Ledebuhr and Thomas M. Origer	2007	A Cultural Resources Survey of the Property at 1020 Grove Street (APN 089-082-032), Healdsburg, Sonoma County, California	Archaeological, Field study	Negative	None
S-037408	Cassandra Chattan and Sally Evans	2009	A Cultural Resources and Historic Structures Evaluation of the Former Oliveto Winery Site, 845 Healdsburg Avenue, Sonoma County, California	Archaeological, Architectural/ historical, Evaluation, Field study		P-49-004258
S-045474	Virginia Ton and Janine M. Origer	2014	A Cultural Resources Survey for the Farmstand Subdivision Project, 979 and 1069 Grove Street (APNs 089-120-004 & 089-081-013), Healdsburg, Sonoma County, California	Archaeological, Field study		P-49-004752

5.1B Recorded and/or Reported Sites (see Table 2)

No prehistoric resources are within or within 0.25 miles of the APE. Three historic resources are within the APE and seven historic resources are within 0.25 miles.

TABLE 2
Archaeological Resources Within/Adjacent to Project Alignment

Resource	Type	Recorded by	Comment
In or adjacent			
P-49-002696 (adjacent)	Historic; pump house with utility poles	1999 (Ballard and Reese) 2002 (Palmer, Kaptain, and Bowler) 2002 (Palmer)	Pump house with series of electrical poles. Resource is mapped within APE but does not appear to be within the proposed pathway. Resource previously evaluated as not eligible for either NRHP or CRHP - resource was demolished (see Longfellow and Gerike 2004).

TABLE 2, con't
Archaeological Resources Within/Adjacent to Project Alignment

Resource	Type	Recorded by	Comment
In or adjacent, con't			
P-49-002834 SON-2322H (adjacent)	Historic; Northwestern Pacific Railroad and associated features	1999 (Ballard and Reese) 2000 (Nelson and Nicholson) 2002 (Palmer)	Resource extends through multiple counties, and has been recorded in numerous segments by other researchers. Project APE is parallel to the resource, crossing the tracks only at Dry Creek Road (STA 14+00). Evaluated by S. Palmer (S-025104a, S-025217) as appears eligible (segment adjacent to the Project APE). Found eligible for the NRHP (see Longfellow and Gerike 2004:25) by State Historic Preservation Officer. Currently not listed in Historic Properties Directory for Sonoma County..
P-49-003014 (adjacent)	Historic; Buried Concrete Wall	2002 (Kaptain)	Resource is mapped within APE but does not appear to be within the proposed pathway. Not previously evaluated (see Longfellow and Gerike 2004:27). It was not relocated in 2018 and appears to have been removed.
Within a 0.25 mile radius			
P-49-002172 SON-1616H	Historic; Fritchey Site Foundations	1988 (Jordan and Villemaire)	Resource is northeast of the north end of the Project APE
P-49-002173 SON-1617H	Historic; Easterly House Building	1988 (Jordan and Villemaire)	Resource is northeast of the north end of the Project APE
P-49-002273 SON-1764H	Historic; Trash Scatter	1989 (Psota, Benson, and Bramlette)	Resource is east of the north end of the Project APE
P-49-002275 SON-1766H	Historic; Old House Building, Site	1988 (Bieling)	Resource is northeast of the north end of the Project APE
P-49-003699	Historic; 100 Chiquita Road; Building and structure	2005 (Beard)	Resource is west of the north end of the Project APE
P-49-004258	Historic; Olivetto Winery; Building	1983 (Langhart Museum) 2009 (Chattan)	Resource is south of the south end of the Project APE
P-49-004752	Historic; Butts Ranch; Building	1983 (anonymous) 2014 (Franco)	Resource is southwest of the south end of the Project APE

5.1C Listed Historic Properties

No local, state or federal historically or architecturally significant structures, landmarks, or points of interest have been identified within or adjacent to the project. Kleinfelder (2009:Table 3.3-1) includes a comprehensive listing of historic resources within or adjacent to the project APE (e.g., extending from Willits to Lombard).

5.1D Archaeological Sensitivity

The proposed alignment of the Foss Creek Pathway, Segments 7 and 8, appears to have a low sensitivity for buried prehistoric and historic archaeological resources based on previous archaeological studies (see Table 1); the lack of reported Native American cultural resources within the APE and immediately adjacent; and, the results of archaeological monitoring completed for the Geysers Recharge Project 2000-2003 (see Longfellow and Gerike 2004). The archaeological monitoring monitored various ground disturbing operations for the installation of a large diameter pipeline adjacent to and under the existing railroad right of way and in many cases under the proposed Foss Creek Pathway (Longfellow and Gerike 2004). Monitoring within the Healdsburg Central and South segments by the cultural resources team in association with a local Native American observer found one subsurface historic cultural resource - a concrete wall (P-49-003014) - that was not affected by the pipeline construction. No other cultural resources were exposed during the construction monitoring within the proposed Foss Creek Pathway, Segments 7 and 8.

6.0 INDIVIDUALS, GROUP AND AGENCY PARTICIPATION

The Native American Heritage Commission (NAHC) was contacted in regard to resources listed on the Sacred Lands Inventory (Busby 2018a). The NAHC Sacred Lands File search noted the presence of sacred sites within the APE (Souza 2018). Communication was recommended with the Mishewal-Wappo Tribe of Alexander Valley and the Lytton Rancheria of California. All of the entities except for the Mishewal-Wappo Tribe of Alexander Valley are federally recognized tribes by the United States Bureau of Indian Affairs (see Indian Entities Recognized and Eligible to Receive Services from the United States Bureau of Indian Affairs, USOFR/BIA 2017). Letters were sent to the eight locally knowledgeable Native American individuals/organizations identified by the NAHC (Busby 2018b-i):

Patricia Hermosillo, Chairperson, Cloverdale Rancheria of Pomo Indians of California;

Chris Wright, Chairperson, Dry Creek Rancheria Band of Pomo Indians, California;

Gene Buvelot, Federated Indians of Graton Rancheria, Rohnert Park;

Greg Sarris, Chairperson, Federated Indians of Graton Rancheria, California;

Chairperson (individual not specified by the NAHC), Kashia Band of Pomo Indians of the Stewarts Point Rancheria, California;

Marjorie Meiia, Chairperson, Lytton Rancheria of California;

Jose Simon III, Chairperson, Middletown Rancheria of Pomo Indians of California; and,

Scott Gabaldon, Chairperson, Mishewal-Wappo Tribe of Alexander Valley.

The Tribal Historic Preservation Officers (THPO) for the Stewarts Point Rancheria Kashia Band of Pomo Indians and the Federated Indians of Graton Rancheria responded and noted the Foss Creek Pathway was outside of their traditional ancestral territory. No additional responses were received.

No other local historical societies, planning departments, etc. were contacted regarding landmarks, potential historic sites or structures in or adjacent to the project.

7.0 ARCHAEOLOGICAL FIELD INVENTORY [Figs. 3-13]

Mr. Christopher Canzonieri (M.A.), an archaeologist meeting the Standards of the Secretary of the Interior, conducted a systematic field inventory of the proposed Foss Creek Pathway APE for Segments 7 and 8 on March 28, 2018 to check for indicators of potential surface and/or subsurface archaeological material [see Fig. 3].

Field transects were oriented north to south and spaced approximately 3 meters apart (starting from Grove Street and walking south to the terminus south of Dry Creek Road and then back to Grove Street). Both banks of Foss Creek were inventoried at the south end for the future pedestrian/bike bridge [Figs. 12-13].

Visibility within the APE was low with approximately 0-20% of the surface observable. Vegetation consisted of seasonal grasses, mustard, conifer trees, oaks, and brush including poison oak along the creek.

7.1 OBSERVATIONS

P-49-002834 (CA-SON-2322H), the Northwestern Pacific Railroad (NWPRR) alignment is present adjacent to the APE (e.g., Lang 2010/form; Schultz 2011/form). The recorded resource includes steel tracks, ties, a rock ballasted bed, navigation signs, culverts, trestles and telegraph poles. The APE is parallel to the resource but does not include the NWPRR alignment except where the trail crosses the tracks once at Dry Creek Road (STA 14+00). The railroad alignment and features adjacent to the APE had been previously evaluated by Palmer (2002c) and Palmer and Kelley (2002) as eligible for the NRHP for its engineering and design. The SHPO concurred with the determination (see Longfellow and Gerike 2004:25).

The tracks are still intact although they are not routinely maintained. The series of telegraph poles described by Palmer (2002a) and Palmer and Kelley (2002) are still upright. Eight of the poles, none with wires and/or insulators present, were noted adjacent to Segment 8 between Grove Street and just south of Dry Creek Road.

P-49-002696, a corrugated metal shack/pump house and several associated wooden utility poles, was recorded in Segment 8 approximately 350 feet south of the intersection of Grove Street and the intersection with the NWPRR. The resource, previously evaluated as not eligible for either the NRHP or the California Register of Historical Resources (CRHR), was demolished during construction associated with the Geysers Recharge Project (see Longfellow and Gerike 2004).

Three concrete drainage culverts passing under the NWPRR tracks were observed in Segment 8 adjacent to the APE. One culvert is located approximately 782 feet south of the intersection of Grove Street and the NWPRR tracks. The second culvert is approximately 1,240 feet south of the intersection of Grove Street and the NWPRR tracks and the third is approximately 2,600 feet south of the intersection of Grove Street and the NWPRR tracks (est. 517 feet north of Dry Creek Road). The concrete culverts measure 28 feet long (from east to west side under the tracks) x 12 feet wide x 52-inches high with a 36-inch diameter opening.

Several discarded isolated wooden and concrete railroad ties were also observed, located just north of the Dry Creek Road, along the west side of the railroad tracks.

No evidence of prehistoric or historically significant archaeological resources or ecofactual materials was observed during the survey with the APE. Several structures associated with the NWPRR were adjacent but outside of the APE and had been previously recorded (see Table 2).

8.0 FINDINGS

This document was prepared to identify historic properties which may be listed, determined or potentially eligible for inclusion on the NRHP and or CRHR within or immediately adjacent to the APE for the Foss Creek Pathway, Segments 7 and 8.

- No historic properties (including archaeological sites, built environment or other resources) have been recorded within the APE.
- One historic property determined eligible for the NRHP for its engineering and design, the Northwestern Pacific Railroad (NWPRR) alignment, is present adjacent and parallel to the APE. The recorded resource includes steel tracks, ties, a rock ballasted bed, navigation signs, culverts, trestles and telegraph poles.
- No known Native American villages, trails, traditional use areas or contemporary use areas and/or other features of cultural significance have been identified in or immediately adjacent to the APE.
- No evidence of significant prehistoric or historically significant archaeological resources or potentially significant architectural resources was observed during the field inventory conducted within the APE.
- No local, state or federal historically or architecturally significant structures, landmarks, or points of interest have been identified within the APE.
- The archival and literature record search, suggest a low potential for subsurface archaeological resources within the APE.
- The APE appears to have a low sensitivity for buried prehistoric and historic archaeological resources based on previous archaeological studies, the lack of reported Native American cultural resources within the APE and immediately adjacent and the results of archaeological monitoring of ground disturbing construction completed for the Geysers Recharge Project 2000-2003 that included the proposed Foss Creek Pathway Segments 7 and 8.

9.0 FINDING OF EFFECT

A reasonable and good faith effort has been made to identify historic properties listed, determined, or potentially eligible for inclusion on the NRHP (36 CFR Part 800.4) within or immediately adjacent to the project APE pursuant to the NHPA of 1966 (as amended) (54 U.S.C. § 306108) and its implementing regulations 36 CFR Part 800. The identification effort included a records search, literature review, consultation with local Native Americans, and a surface field inventory of the APE.

The regulations implementing Section 106 define an effect as any action that would alter the characteristics of the property that may qualify the property for inclusion in the NRHP and, diminish the integrity of a property's location, setting, design, materials, workmanship, feeling or association (36 CFR Part 800.5(a)(1-2)).

The proposed Foss Creek Pathway, Sections 7 and 8, will not impact any NRHP historic properties within the APE including potential subsurface cultural resources. However, one historic property determined eligible for the NRHP for its engineering and design, the NWPRR alignment, is present adjacent to and parallel to the APE. The proposed project will not the affect the eligible historic property such that its potential for inclusion on the NRHP under any of the criteria (36 CFR Part 60) could be affected. A determination of *Historic properties affected* (36 CFR Part 800.4(d)(2)) and the finding that the undertaking will have no adverse effect as defined in 36 CFR Part 800.5(a)(1), 800.5(b), and 800.16(i) is applicable.

10.0 MITIGATION MEASURES AND POST-REVIEW DISCOVERY PROCEDURES

No mitigation measures are required. The proposed undertaking will not adversely affect any NRHP listed, determined or potentially eligible properties. The following conditions are recommended to enhance the finding of *Historic properties affected, no adverse effect*:

- The development of a formal *Post-Review Discovery Plan* is not recommended as ground disturbing excavation is not anticipated to affect any surface or subsurface archaeological deposits.

  Previous archaeological monitoring of the proposed Foss Creek Pathway alignment during ground disturbing construction for the Geysers Recharge Project 2000-2003 did not expose any significant subsurface archaeological resources. Anticipated ground disturbing impacts for the proposed project will consist of path preparation to a maximum depth of two feet below existing grade, the installation of small diameter metal fence posts for a standard chain link fence, and the installation of a number of concrete piers to a maximum depth of five feet for the precast concrete boardwalk within two wetland areas.

- In the event of post-review discoveries of cultural resources,[11] the U.S. Army Corps of Engineers, San Francisco District, shall be notified so that any discoveries may be treated in accordance with 36 CFR Part 800.13(b).

---

11. Significant prehistoric cultural materials may include:
    a. Human bone - either isolated or intact burials.
    b. Habitation (occupation or ceremonial structures as interpreted from rock rings/features, distinct ground depressions, differences in compaction (e.g., house floors).
    c. Artifacts including chipped stone objects such as projectile points and bifaces; groundstone artifacts such as manos, metates, mortars, pestles, grinding stones, pitted hammerstones; and, shell and bone artifacts including ornaments and beads.
    d. Various features and samples including hearths (fire-cracked rock; baked and vitrified clay), artifact caches, faunal and shellfish remains (which permit dietary reconstruction), distinctive changes in soil stratigraphy indicative of prehistoric activities.
    e. Isolated artifacts

    Significant historic cultural materials may include finds from the late 19th through early 20th

- The exposure of any Native American burials shall be handled in accordance with state law.

11.0 REFERENCES CITED AND CONSULTED

Adams, Jane

1980 Historic Resource Evaluation Report: 04-Son-101-Bypass R49.8/56.2. A Historic Overview of Cloverdale, California and a Description of Historic Archaeological Remains, and Historic and Architectural Resources within the Proposed Area for the Route 101 Freeway Bypass 04225 - 121451. MS on file, S-8082, CHRIS/NWIC, CSU Sonoma, Rohnert Park.

Anonymous

1983 P-49-004752 (Butts Ranch; Building). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Ballard, Hannah and Elena Reese

1999a P-49-002696 (pump house and utility poles). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

1999b P-49-002834 (CA-SON-2322H; Northwestern Pacific Railroad and associated features). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Barrett, Samuel A.

1908 The Ethno-Geography of Pomo and Neighboring Indians. University of California Publications in American Archaeology and Ethnology 6(1):1-332. [including *Map of the Territory of the Pomo Linguistic Stock and of the adjacent territories of other linguistic stocks showing dialectic subdivisions and village sites.]*

Basgall, Mark E.

1982 Archaeology and Linguistics: Pomoan Prehistory as Viewed from Northern Sonoma County, California. Journal California and Great Basin Anthropology 4(2):3-22.

---

centuries. Objects and features associated with the Historic Period can include.

a. Structural remains or portions of foundations (bricks, cobbles/boulders, stacked field stone, postholes, etc.).
b. Trash pits, privies, wells and associated artifacts.
c. Isolated artifacts or isolated clusters of manufactured artifacts (e.g., glass bottles, metal cans, manufactured wood items, etc.).
d. Human remains.

In addition, cultural materials including both artifacts and structures that can be attributed to Hispanic, Asian and other ethnic or racial groups are potentially significant. Such features or clusters of artifacts and samples include remains of structures, trash pits, and privies.

Basgall, Mark E. and Paul Bouey
1984 Prehistory of Northern Sonoma County, The Warm Springs Dam Report. Draft MS on file, U.S. Army Corps of Engineers, San Francisco.

Beard, Vicki
2005 P-49-003699 (100 Chiquita Road; Building and structure). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Beck, W.A. and Y.D. Haase
1974 Historical Atlas of California (Third printing, 1977). University of Oklahoma Press, Norman.

Bell & Heymans
1888 Map of Sonoma County, Cal. Published by Bell & Heymans. N.p. (Detail of map provided by CHRIS/NWIC File No. 01-1576).

Bennyhoff, James A.
1994 The Napa District and Wappo Prehistory. In Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson, edited by Richard E. Hughes, pp. 49-56. Contributions of the University of California Archaeological Research Facility, No. 52. Berkeley.

Bennyhoff, James A. and David A. Fredrickson
1994 Toward a New Taxonomic Framework for Central California Archaeology: Essays (edited by Richard E. Hughes). Contributions of the University of California Archaeological Research Facility 52.

Bieling, [? initial]
1988 P-49-002275 (CA-SON-1766H; Old House Building; site). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Brown, Vinson and Douglas Andrews
1969 The Pomo Indians of California and Their Neighbors (edited by Albert B. Elsasser). Vol. 1, American Indian Map-book Series. Naturegraph Publishers, Healdsburg.

Busby, Colin I. (Basin Research Associates, San Leandro)
2018a Native American Heritage Commission [NAHC] Sacred Lands File & Native American Contacts List Request: *Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County*. Via email nahc@nahc.ca.gov on 3/02/2018.

2018b-i Letters to Patricia Hermosillo, Chairperson, Cloverdale Rancheria of Pomo Indians of California; Cloverdale; Chris Wright, Chairperson, Dry Creek Rancheria Band of Pomo Indians, Geyserville; Gene Buvelot, Federated Indians of Graton Rancheria, Rohnert Park; Greg Sarris, Chairperson, Federated Indians of Graton Rancheria, Rohnert Park; Chairperson, Kashia

Band of Pomo Indians of the Stewarts Point Rancheria, Santa Rosa; Marjorie Meiia, Chairperson, Lytton Rancheria of California, Santa Rosa; Jose Simon III, Chairperson, Middletown Rancheria, Middletown; and, Scott Gabaldon, Chairperson, Mishewal-Wappo Tribe of Alexander Valley, Windsor. Regarding: *Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County*. Dated March 2, 2018.

Cage, DeWitt C.

1857 Plat of the Sotoyome Rancho finally confirmed to the heirs of Henry Fitch. Surveyed under the order of the U.S. Surveyor General by DeWitt C. Cage, dept[uty] surv[eyor], April 1857. Map on file, California State Office, Bureau of Land Management, Sacramento.

California (State of), Department of Parks and Recreation, Office of Historic Preservation (**CAL/OHP**)

1973 The California History Plan, Volume One - Comprehensive Preservation Program. Volume Two - Inventory of Historic Features.

1976 California Inventory of Historic Resources.

1988 Five Views: An Ethnic Sites Survey for California.

1990 California Historical Landmarks [with updates].

1992 California Points of Historical Interest [with updates].

2012a *[Historic Properties Directory*] Directory of Properties in the Historic Property Data file for Healdsburg, Sonoma County (includes *National Register of Historic Places* status codes, *California Historical Landmarks* and *California Points of Historical Interest* listings, etc.). Dated 4/12/2012 [most recent of 3/21/2018].

2012b *Archeological Determinations of Eligibility* for Sonoma County. Dated 4/05/2012 [most recent as of 3/21/2018, viewed by CHRIS/NWIC].

2018 Listed California Historical Resources – Sonoma County [including National Register, State Landmark, California Register, and Point of Interest]. <http://ohp.parks.ca.gov/ListedResources/?view=county&criteria=49> accessed 3/09/2018).

Chattan, Cassandra

2009 P-49-004258 (Oliveto Winery; Building). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Clayborn, Hannah

2003-2007 Hannah Clayborn's History of Healdsburg: Clark Foss: the Most Famous Stagecoach Driver in the World [2003]. Ourhealdsburg.com. Web accessed 3/02/2018.

Coy, W.C.
1973 California County Boundaries: A Study of the Division of the State into Counties and the Subsequent Changes in their Boundaries (Revised edition). California Historical Survey Commission. Valley Publishers, Fresno.

Cuyás, Arturo with various
1972 Appleton's New Cuyás English-Spanish and Spanish-English Dictionary. Appleton-Century-Crofts, New York.

Davis, James T.
1961 Trade Routes and Economic Exchange Among the Indians of California. University of California Archaeological Survey Reports 54.

Du Bois, Cora
1939 The 1870 Ghost Dance. Anthropological Records Anthropological Records 3 (1).

Eargle, Jr., Dolan H.
1986 The Earth is Our Mother: A Guide to the Indians of California, Their Locales and Historic Sites. Trees Company Press, San Francisco.

Elsasser, A.B.
1978 Development of Regional Prehistoric Cultures. In *California*, edited by R. F. Heizer, Volume 8. Handbook of North American Indians, W.G. Sturtevant, general editor, pp. 37-57. Smithsonian Institution, Washington, D. C.

Fickewirth, Alvin A.
1992 California Railroads: An Encyclopedia of Cable Car, Common Carrier, Horsecar, Industrial Interurban, Logging, Monorail, Motor Road, Short Lines, Streetcar, Switching and Terminal Railroad in California (1851-1992). Golden West Books, San Marino.

Finley, Ernest Latimer
1937 History of Sonoma County California Its People and Its Resources. Golden Gate Bridge Edition. Press Democrat Publishing Company, Santa Rosa. Reprinted by Higginson Book Company, Salem, Massachusetts.

Franco, Julia
2014 P-49-004752 (Butts Ranch; Building). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Fredrickson, David A.
1966 CCo-308: The Archaeology of a Middle Horizon site in Interior Contra Costa County, California. M.A. thesis, Department of Anthropology, University of California, Davis.

1968 Archaeological Investigations at CCo-30 near Alamo, Contra Costa County. Center for Archaeological Research at Davis, No. 1.

1973 Early Cultures of the North Coast Ranges, California. Ph.D. dissertation, Department of Anthropology, University of California, Davis.

1974 Cultural Diversity in Early Central California: A View from the North Coast Ranges. Journal of California Anthropology 1(1):41-53.

1984 The North Coast Region. In California Archaeology. Academic Press, New York.

1994a Archaeological Taxonomy in Central California Reconsidered. In Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson, edited by Richard E. Hughes. Contributions of the University of California Archaeological Research Facility 52.

1994b Spatial and Cultural Units in Central California Archaeology. In Toward a New Taxonomic Framework for Central California Archaeology: Essays by James A. Bennyhoff and David A. Fredrickson, edited by Richard E. Hughes, pp. 25-47. Contributions of the University of California Archaeological Research Facility 52.

Fredrickson and the Staff of the Anthropology Laboratory, Sonoma State College
1977 Chapters III-VIII Historical & Archaeological Resources. In A Summary of Knowledge of the Central and Northern California Coastal Zone and Offshore Areas. Vol. III Socioeconomic Conditions. Chapters 6-7. Winzler and Kelly, Eureka, California for Bureau of Land Management, Department of Interior, Contract AA550-CT6-52. Formerly MS on file, S-848, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Garaventa, Donna M. with Rebecca Loveland Anastasio, James C. Bard, Melissa C. Kennard and Larry S. Kobori (Basin Research Associates)
1983 A Cultural Resources Property Survey Report for the Proposed Wastewater Plan Alignment along Healdsburg Avenue, North, First, and Second Streets, City of Healdsburg, Sonoma County, California. MS on file, S-6183, Sonoma State University, Rohnert Park.

Gifford, E.W. and A.L. Kroeber
1937 Culture Element Distributions: IV Pomo. University of California Publications in American Archaeology and Ethnology 23(l):1-122.

Gudde, Erwin G.
1998 California Place Names: The Origin and Etymology of Current Geographical Names (fourth edition, revised and enlarged by William Bright). University of California Press, Berkeley.

Hansen, H.J., and J.T. Miller
1962 Wild Oats in Eden: Sonoma County in the 19th Century. Harvey J. Hansen and Jeanne Thurlow Miller, Santa Rosa.

Hart, J.D.
1987 A Companion to California (revised and expanded). Oxford University Press, New York.

Healdsburg (City of) Planning & Building Department **(HealdsburgP&B)**
2009/2015 Healdsburg 2030 General Plan Policy Document. Adopted July 6, 2009 including amendments through January 2015. Web accessed 2/28/2018.

Healdsburg (City of) Planning & Building Department with various
2009/2010 Healdsburg 2030 General Plan Background Report. Adopted by the Healdsburg City Council on July 6, 2009. Amended by the Healdsburg City Council on January 4, 2010. Web accessed 2/28/2018.

Heizer, Robert F.
1958 Salt in California Indian Culture. In Salt in California prepared by O. P. Jenkins, pp. 103-104. California Division of Mines Bulletin 175.

Hendry, G.W. and J.N. Bowman
1940 The Spanish and Mexican Adobe and Other Buildings in the Nine San Francisco Bay Counties, 1776 to about 1850. MS on file, Bancroft Library, University of California, Berkeley.

Hildebrandt, William R.
2007 Chapter 7. Northwest California: Ancient Lifeways among Forested Mountains, Flowing Rivers, and Rocky Ocean Shores.. In California Prehistory: Colonization, Culture, and Complexity, edited by Terry L. Jones and Kathryn A. Klar, pp. 83-97. Altamira Press, New York.

Hoover, M.B., H.E. Rensch, E.G. Rensch and W.N. Abeloe
1966 Historic Spots in California (Third edition, revised by William N. Abeloe). Stanford University Press, Palo Alto.

Jones, Terry L. and Kathryn A. Klar (editors)
2007 California Prehistory: Colonization, Culture, and Complexity. Altamira Press, a division of Rowman & Littlefield Publishers, Inc., New York with the Society for California Archaeology.

Jones & Stokes Associates, Inc.
2000 Final Cultural Resources Inventory Report for the Proposed Fiber Optic Cable Routes Between Point Arena and Robbins and Point Arena and Sacramento, California. MS on file, S-22736, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Jordan, L. and B. Villemaire
1988a P-49-002172 (CA-SON-1616H; Fritchey Site foundations). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

1988b P-49-002173 (CA-SON-1617H; Easterly House Building). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Kaptain, Neal
2002 P-49-003014 (Buried concrete wall). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

King, Chester D.
1978 Protohistoric and Historic Archaeology. In *California*, edited by R.F. Heizer, Volume 8. Handbook of North American Indians, W. G. Sturtevant, general editor, pp. 58-68. Smithsonian Institution, Washington, D.C.

Kleinfelder
2009 Public Draft Environmental Impact Report North Coast Railroad Authority Russian River Division Freight Rail Project. Prepared for North Coast Railroad Authority. November 2009. Kleinfelder, Santa Rosa. Web accessed 3/02/2018.

Kroeber, A.L.
1925 Handbook of the Indians of California. Bureau of American Ethnology Bulletin 78. Government Printing Office, Washington, D.C.

Kyle, Douglas E.
1990 Historic Spots in California (Fourth edition of M.B. Hoover, H.E. Rensch and E.G. Rensch). Stanford University Press, Stanford.

Langhart Museum
1983 P-49-004258 (Oliveto Winery [Olivetto; Olivette]; Building). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Loeb, Edwin M.
1926 Pomo Folkways. University of California Publications in American Archaeology and Ethnology 19(2):149-404.

Longfellow, Joy and Christian Gerike
2004 Cultural and Paleontological Resources Monitoring 2000-2003, The Geysers Recharge Project, Sonoma County, California. MS on file, S-28098, CHRIS/NWIC, Sonoma State University, Rohnert Park.

McLendon, Sally and Robert L. Oswalt
1978 Pomo: Introduction. In *California*, edited by R.F. Heizer, Volume 8. Handbook of North American Indians, W.G. Sturtevant, general editor, pp. 274-288. Smithsonian Institution, Washington, D.C.

Menefee, C.A.
1873 Historical and Descriptive Sketch Book of Napa, Sonoma, Lake, and Mendocino. Reporter Publishing House, Napa City.

Metsker Maps

n.d. Metsker's Map of Sonoma County, California. The Sportsman's Guide. Thomas C. Metsker, Tacoma.

Miller, J. T.

1967 Seeing Historic Sonoma Today. Miller Associates, Santa Rosa.

Moratto, Michael J.

1984 California Archaeology. Academic Press, New York.

Neal, Annette (CHRIS/NWIC staff researcher)

2018 Records Search Results. Foss Creek Pathway [Sonoma County, CA]. CHRIS/NWIC File. No. 17-2138. Dated March 21, 2018. On file, Basin Research Associates, San Leandro.

Nelson, J. and S. Nicholson

2000 P-49-002834 (CA-SON-2322H; Northwestern Pacific Railroad and associated features). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Palmer, Sara

2002a P-49-002696 (supplement; pump house and utility poles). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

2002b P-49-002834 (CA-SON-2322H; update; Northwestern Pacific Railroad and associated features). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

2002c National Register Eligibility Evaluation of a Section of the Northwestern Pacific Railroad Near Healdsburg, Sonoma County, California. MS on file, S-025104a, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Palmer, Sara and John Kelley

2002 National Register Eligibility Evaluation of a Section of the Northwestern Pacific Railroad, Near Healdsburg, Sonoma County, California. MS on file, S-025217, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Palmer, Sara, Neal Kaptain, and Pamela Bowler

2002 P-49-002696 (supplement; pump house and utility poles). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Parsons Brinckerhoff Quade & Douglas, Inc., Community Design + Architecture, Environ Trans Solutions Inc., Garcia and Associates, HDR Engineering, Inc., MACTEC Engineering and Consulting, Inc., and Winzler & Kelly Consulting Engineers **(Parsons Brinckerhoff)**

2005 DRAFT Environmental Impact Report [EIR] Sonoma-Marin Area Rail Transit [SMART]. SCH #2002112033. November 2005. Web accessed.

Psota, S., [? initial] Benson, and [? initial] Bramlette
1989 P-49-002273 (CA-SON-1764H; Historic; Trash Scatter). Form on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Patera, E.L. (editor)
1991 H.E. Salley History of California Post Offices 1849-1990 (Second edition). The Depot, n.p. (Salley, H.E. and E.L. Patera, researchers).

Robertson, Donald B.
1998 Encyclopedia of Western Railroad History. Volume IV California. The Caxton Printers, Ltd, Caldwell, Idaho.

Schultz, Erica (Ganda)
2011 P-49-002834 (CA-SON-2322H; continuation sheet; Northwestern Pacific Railroad MP 19.3-369.9; P-21-002618 in Marin County. On file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

Souza, Sharaya (Native American Heritage Commission) **(NAHC)**
2018 Letter via e-mail to Colin I. Busby, Basin Research Associates, San Leandro. Regarding: [Request for Review of Sacred Lands Inventory] , *Foss Creek Pathway, Sections 7-8, [Jimtown and City] of Healdsburg, Sonoma County.* Dated March 8, 2018.

Stewart, Omer C.
1943 Notes On Pomo Ethnogeography. University of California Publications In American Archaeology and Ethnology, 40(2):29-62.

1978 Litigation and Its Effects. In California, edited by R.F. Heizer, Volume 8. Handbook of North American Indians, W.G. Sturtevant, general editor, pp. 705-717, Smithsonian Institution, Washington, D.C.

Stewart, Suzanne B.
1981 [Second Draft] Archaeological Overview of Sonoma and Napa Counties. IN: Northwest Regional Office, California Archaeological Sites Survey, Anthropological Studies Center (preparer), Overview of Prehistoric Archaeology for the Northwest Region California Archaeological Sites Survey Del Norte, Humboldt, Mendocino, Lake, Sonoma, Napa, Marin, Contra Costa, Alameda, pp. 3.0-3.114. Rohnert Park

1982 Volume 3 Napa and Sonoma Counties. In Prehistoric Overview Northwest Region: California Archaeological Inventory, David A. Fredrickson, general editor. Anthropological Studies Center, Sonoma State University, Rohnert Park.

Stindt, F.A. and G.L. Dunscomb
1964 The Northwest Pacific Railroad Redwood Empire Route. Stindt and Dunscomb, Modesto.

Thompson, Thomas H. and Company
1877 Historical Atlas Map of Sonoma County California. Thomas H. Thompson and Company, Oakland.

Thompson, Robert A.
1877 Historical and Descriptive Sketch of Sonoma County California. L.H. Everts and Company, Philadelphia.

Tuomey, H.
1926 History of Sonoma County California. S.J. Clarke Publishing Company, San Francisco.

United States Department of Interior, Geological Survey **(USGS)**
1980 Healdsburg, Calif. [Quadrangle]. Topographic map, 7.5 minute series (1955 photorevised).
1993 Healdsburg, Calif. [Quadrangle]. Topographic map, 7.5 minute series.
1997 Geyserville, CA [Quadrangle]. Topographic map, 7.5 minute series.
1997 Guerneville, CA [Quadrangle]. Topographic map, 7.5 minute series.
1975 Jimtown, Calif. [Quadrangle]. Topographic map, 7.5 minute series (1955 photorevised).
1993 Jimtown, Calif. [Quadrangle]. Topographic map, 7.5 minute series. United States Geological Survey, Menlo Park.

United States Department of the Interior, National Register of Historical Places, National Park Service **(USNPS)**
1995 Map Supplement for the Comprehensive Management and Use Plan Juan Bautista de Anza National Historic Trail Arizona California. Pacific Great Basin Support Office, National Park Service. [San Francisco].

2015/2017 National Register of Historic Places Program: Research – Data Downloads. Spreadsheets: www.NPS.gov/nr/research/data_downlaods.htm NRHP list, Multiple Property Cover Documents (to July 2015); NHLs [National Historic Landmarks, and "Everything: National Register of Historic Places Properties: Listed/Removed/eligible (up to December 2017). Accessed 3/07/2018.

United States Office of the Federal Register **(USOFR/BIA)**
2017 Indian Entities Recognized and Eligible to Receive Services from the United States Bureau of Indian Affairs. Federal Register 82(10):4915-4920. Web accessed 3/09/2018.

United States, Army Corps of Engineer **(US/ACE)**
1915 Healdsburg, California [Quadrangle]. Topographic map, 15 minute series. Scale 1:62,5000.

Walker, Mike
1994 Steam Powered Video's Comprehensive Railroad Atlas of North America. California and Nevada. Steam Powered Publishing, Faversham, Kent.

Wallace, William J.
1978 Post-Pleistocene Archaeology, 9000 to 2000 B.C. In *California*, edited by R.F. Heizer, Volume 8. Handbook of North American Indians, W.G. Sturtevant, general editor, pp. 25-36. Smithsonian Institution, Washington, D.C.

Walt Smith and Associates **(WSA)**
1981 Draft Environmental Impact Result Preliminary Plan of the Sotoyome Community Development Area Healdsburg, California. Walt Smith and Associates, Santa Rosa.

Whistler, Kenneth W.
1980 Pomo Prehistory A Case for Archaeological Linguistics (December 1, 1977, revised April 16, 1980). MS on file, S-2107, CHRIS/NWIC, Sonoma State University, Rohnert Park [cited as 1980b in Moratto 1984].

White, Gregory and David A. Fredrickson
1992 A Research Design for the Anderson Flat Project, Archaeological Data Recovery Investigations at Sites CA-LAK-72, 509, 510 536, 538, 542, and 1375, Lake County. MS on file, CHRIS/NWIC, Sonoma State University, Rohnert Park.

White, Gregory and David A. Fredrickson, Lori D. Hager, Jack Meyer, Jeffery S. Rosenthal, Michael R. Waters, G. James West, and Eric Wohlgemuth
2002 Cultural Diversity and Culture Change in Prehistoric Clear Lake Basin: Final Report of the Anderson Flat Project. Center for Archaeological Research at Davis, No. 13.

Wikipedia
2018 Healdsburg, California. Dated 2/17/2018. Web accessed 3/02/2018.

<u>Abbreviations</u>

n.d.	no date	v.d.	various dates	N.P.	no publisher noted
n.p.	no place of publisher noted				

CHRIS/NWIC, Sonoma State University, Rohnert Park is used to designate archival material on file at the California Historical Resources Information System, Northwest Information Center, Sonoma State University, Rohnert Park.

ATTACHMENTS

FIGURES

FIGURE 1	General Project Location (ESRI World Street Map)
FIGURE 2	Project Alignment - T9N R9W (USGS Geyserville, CA 1997; Jimtown, Calif. 1993; Guerneville, CA 1997; and Healdsburg, Calif. 1993)
FIGURE 3	Area of Potential Effects with Photo View Locations
FIGURE 4	View south from northern end of Segment 8 at Grove Street
FIGURE 5	Segment 8 - view south, west of Healdsburg Community Center parking lot
FIGURE 6	Segment 8 - culvert west of Healdsburg Community Center playground - view west
FIGURE 7	Segment 8 - view south, west of Healdsburg Community Center sports field
FIGURE 8	Segment 8 - view south towards Dry Creek Road, just south of community center
FIGURE 9	Segment 8 - view south towards Dry Creek Road
FIGURE 10	Segment 7 - view north towards Dry Creek Road
FIGURE 11	Segment 7 - view north from ca. 900 feet south of Dry Creek Road
FIGURE 12	View west towards proposed pedestrian bridge location at south end of Segment 7
FIGURE 13	View southwest across Foss Creek, at south end of Segment 7
APE MAP	Foss Creek Pathway - Segments 7 & 8 Archaeological Area of Potential Effects

CORRESPONDENCE

LETTER	Request to Native American Heritage Commission
LETTER	Response from Native American Heritage Commission
LETTER	Letters to Native American Individuals and Groups Recommended by the Native American Heritage Commission
RESPONSES	Native American Responses

CHRIS/NWIC SEARCH RESULTS

SEARCH 1	CHRIS/NWIC File No. 17-2138 dated 3/212018 (No Confidential Information)

Figure 1: General Project Location (ESRI World Street Map)

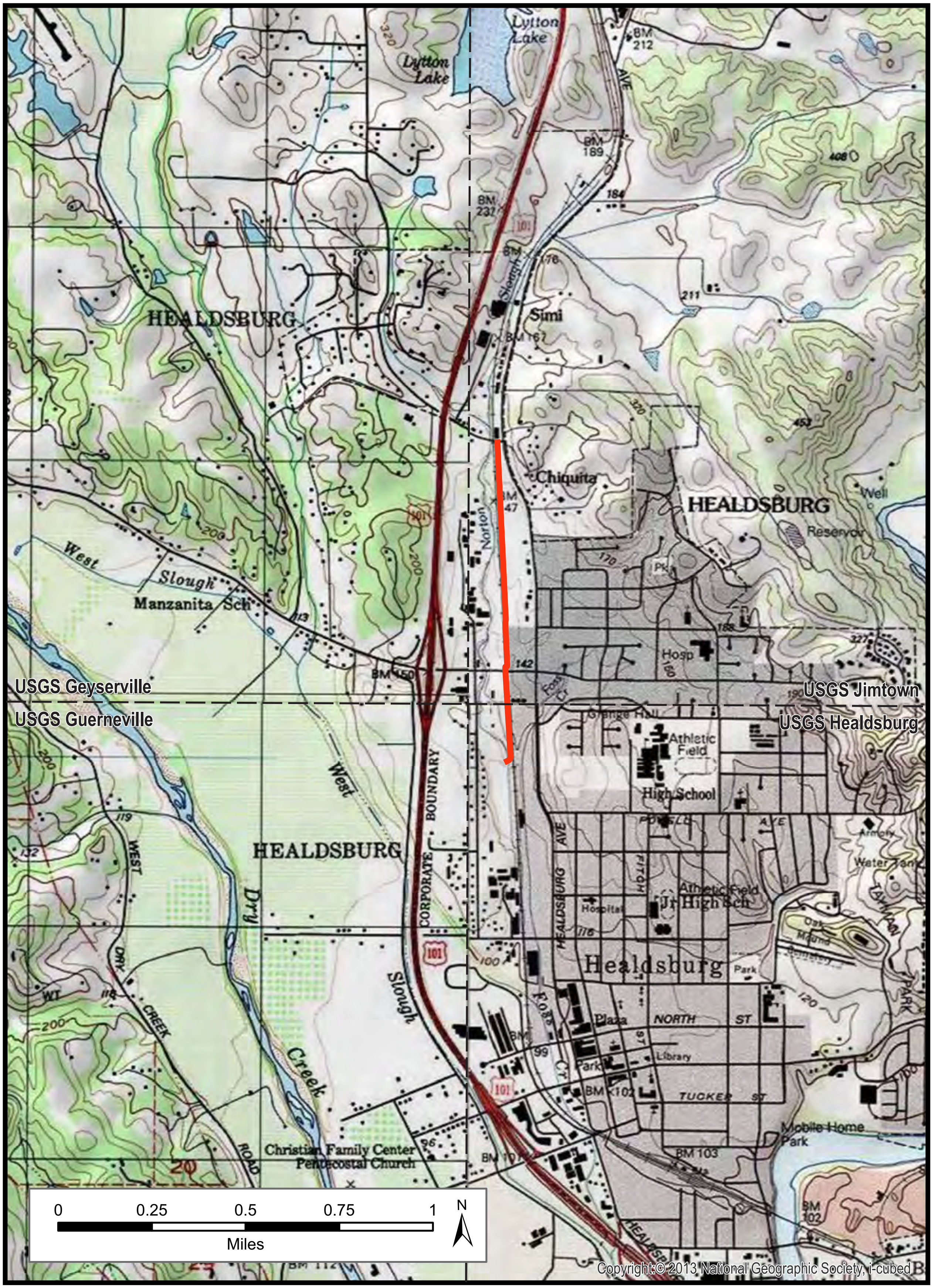


Figure 2: Project Alignment - T9N R9W (USGS Geyserville, CA 1997; Jimtown, Calif. 1993; Guerneville, CA 1997; and Healdsburg, Calif. 1993)

Figure 3: Area of Potential Effects with Photo View Locations

Figure 4: View south from northern end of Segment 8 at Grove Street

Figure 5: Segment 8 - view south, west of Healdsburg Community Center parking lot

Figure 6: Segment 8 - culvert west of Healdsburg Community Center playground - view west

Figure 7: Segment 8 - view south, west of Healdsburg Community Center sports field

Figure 8: Segment 8 - view south towards Dry Creek Road, just south of community center

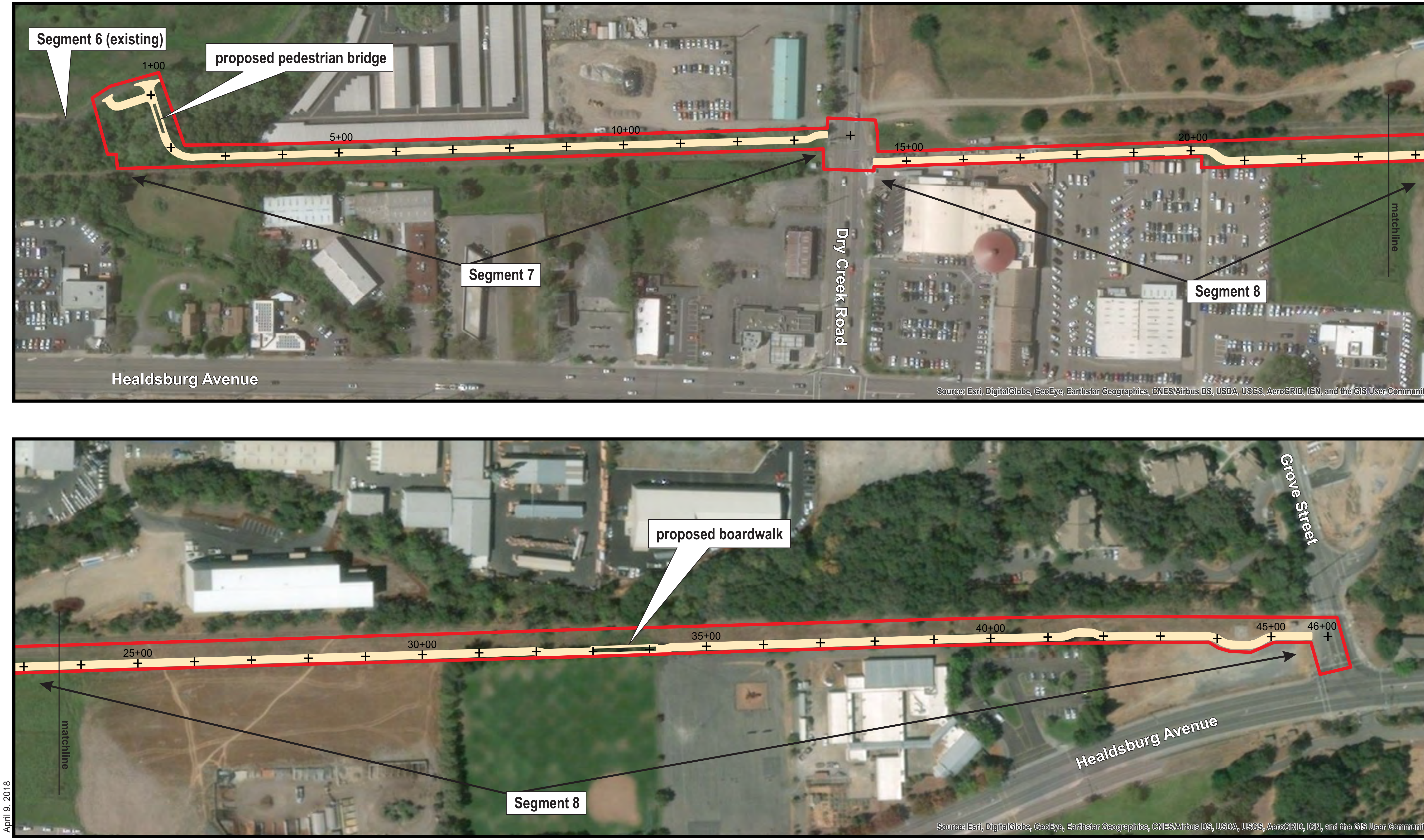
Figure 9: Segment 8 - view south towards Dry Creek Road

Figure 10: Segment 7 - view north towards Dry Creek Road

Figure 11: Segment 7 - view north from ca. 900 feet south of Dry Creek Road

Figure 12: View west towards proposed pedestrian bridge location at south end of Segment 7

Figure 13: View southwest across Foss Creek, at south end of Segment 7



April 9, 2018

0 100 200 300 400
Feet
N

Pathway Alignment

Archaeological Area of Potential Effects

Foss Creek Pathway - Segments 7 & 8
Archaeological Area of Potential Effects

Sacred Lands File & Native American Contacts List Request

NATIVE AMERICAN HERITAGE COMMISSION

1556 Harbor Boulevard, STE 100
West Sacramento, CA 95691
(916) 373-3710
(916) 373-5471 – Fax
nahc@nahc.ca.gov

Information Below is Required for a Sacred Lands File Search

Project: *Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County,*
County: Sonoma

USGS Quadrangle Name: USGS Jimtown, Calif. 1993 and USGS Healdsburg, Calif. 1993)

Address: No street address - roughly between Grove Street on north to Ferrero Drive on the south paralleling the Northwestern Pacific (North Coast) railroad alignment.

Township: 9 North, **Range**: 9 West, unsectioned

Company/Firm/Agency: Basin Research Associates

Contact Person: Colin I. Busby, PhD, RPA

Street Address: 1933 Davis Street, STE 210

City/Zip: San Leandro, CA 94577

Phone: (510) 430-8441 x202

Fax: Please send response to basinresfax@gmail.com

Email: colinbusby@basinresearch.com

Project Description:

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved pedestrian path. The project proposes to extend the existing north-south pathway to parallel Foss Creek and/or the Northwestern Pacific Railroad and run along the western edge of the City of Healdsburg (City)

Pathway features will are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control. All of the improvements will be contained within existing public right of way and easements.

The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

Date: 3/2/2018

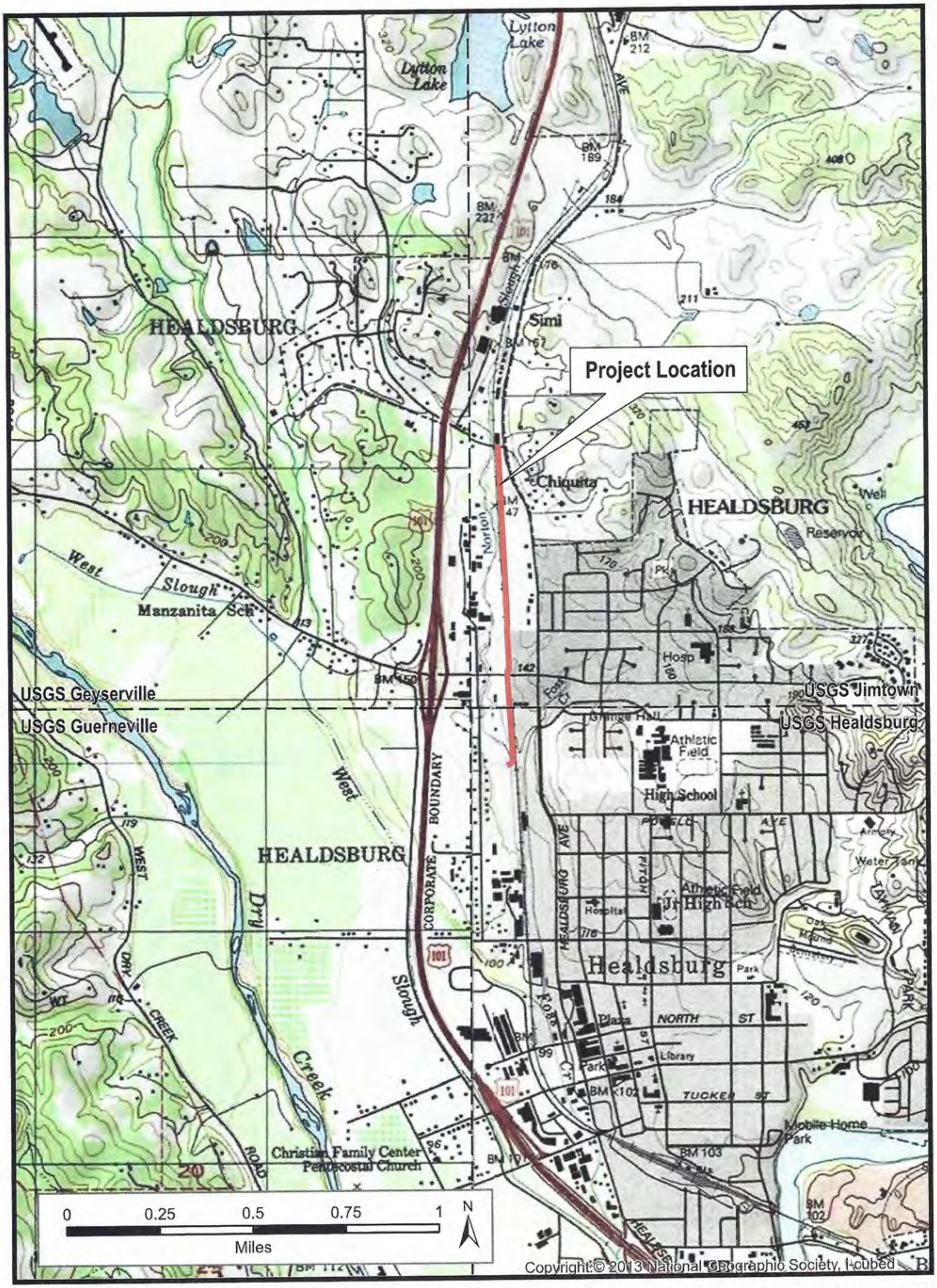


Figure 1: Project Alignment T9N R9W (USGS Jimtown, Calif. 1993 and Healdsburg, Calif. 1993)

NATIVE AMERICAN HERITAGE COMMISSION
Environmental and Cultural Department
1550 Harbor Blvd., ROOM 100
West SACRAMENTO, CA 95691
(916) 373-3710

March 8, 2018

Colin Busby
Basin Research Associates

Sent by Email: basinresfax@gmail.com
Number of Pages: 2

RE: Foss Creek Pathway Sections 7-8, Jimtown and Healdsburg, Sonoma County

Dear Mr. Busby:

A record search of the Native American Heritage Commission (NAHC) *Sacred Lands File* (SLF) was completed for the area of potential project effect (APE) for the above referenced project. **Sacred Sites were identified in the project area provided.** For the Jimtown quad please contact the Mishewal-Wappo Tribe of Alexander Valley and the Lytton Rancheria of California. For the Healdsburg quad please contact the the Mishewal-Wappo Tribe of Alexander Valley directly for more information about the sacred sites and tribal cultural resources within your APE.

The absence of site information in the *Sacred Lands File* does not indicate the absence of Native American cultural resources in any APE. Other sources of cultural resources information should be contacted regarding known and recorded sites. Please contact all of the people on the attached list. The list should provide a starting place to locate areas of potential adverse impact within the APE. I suggest you contact all of those listed, if they cannot supply information, they might recommend others with specific knowledge. **By contacting all those on the list, your organization will be better able to respond to claims of failure to consult under applicable laws.** If a response has not been received within two weeks of notification, the NAHC requests that you follow-up with a telephone call to ensure that the project information has been received.

If you receive notification of change of addresses and phone numbers from any of these individuals or groups, please notify me. With your assistance we are able to assure that our lists contain current information. If you have any questions or need additional information, please contact me at my email address: sharaya.souza@nahc.ca.gov.

Sincerely,

Sharaya Souza
Staff Services Analyst
(916) 573-0168

Native American Heritage Commission
Native American Contacts
3/8/2018

Cloverdale Rancheria of Pomo Indians of California
Patricia Hermosillo, Chairperson
555 S. Cloverdale Blvd., Suite A — Pomo
Cloverdale, CA 95425
(707) 894-5775
(707) 894-5727

Dry Creek Rancheria Band of Pomo Indians
Chris Wright, Chairperson
P.O. Box 607 — Pomo
Geyserville, CA 95441
(707) 522-4233
(707) 522-4286

Federated Indians of Graton Rancheria
Gene Buvelot
6400 Redwood Drive, Ste 300 — Coast Miwok, Southern Pomo
Rohnert Park, CA 94928
gbuvelot@gratonrancheria.com
(415) 279-4844 Cell
(707) 566-2288 ext 103

Federated Indians of Graton Rancheria
Greg Sarris, Chairperson
6400 Redwood Drive, Ste 300 — Coast Miwok, Southern Pomo
Rohnert Park, CA 94928
(707) 566-2288 Office
(707) 566-2291 Fax

Kashia Band of Pomo Indians of the Stewarts Point R
Chairperson
1420 Guerneville Rd. Ste 1 — Pomo
Santa Rosa, CA 95403
(707) 591-0580 Office
(707) 591-0583 Fax

Lytton Rancheria of California
Marjorie Mejia, Chairperson
437 Aviation Blvd. — Pomo
Santa Rosa, CA 95403
margiemejia@aol.com
(707) 575-5917
(707) 575-6974 - Fax

Middletown Rancheria
Jose Simon III, Chairperson
P.O. Box 1035 — Pomo, Lake Miwok
Middletown, CA 95461
(707) 987-3670 Office
(707) 987-9091 Fax

Mishewal-Wappo Tribe of Alexander Valley
Scott Gabaldon, Chairperson
2275 Silk Road — Wappo
Windsor, CA 95492
scottg@mishewalwappotribe.com
(707) 494-9159

This list is current only as of the date of this document and is based on the information available to the Commission on the date it was produced.

Distribution of this list does not relieve any person of statutory responsibility as defined in Section 7050.5 of the Health and Safety Code, Section 5097.94 of the Public Resource Section 5097.98 of the Public Resources Code.

This list is only applicable for contacting local Native American Tribes for the proposed: Foss Creek Pathway Sections 7-8, Jimtown and Healdsburg, Sonoma County.

March 9, 2018

BASIN RESEARCH ASSOCIATES
1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Ms. Patricia Hermosillo, Chairperson
Cloverdale Rancheria of Pomo Indians of California
555 S. Cloverdale Blvd., Suite A
Cloverdale, CA 95425

RE: Request for Information
Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County

Dear Patricia,

The Native American Heritage Commission (NAHC) has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map). **The NAHC *Sacred Lands File Search* noted the presence of Sacred Sites within the project Area of Potential Effect (APE).**

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved bicycle and pedestrian path/trail within an existing public right of way and easements. The project proposes to extend the existing north-south pathway parallel Foss Creek and/or the Northwestern Pacific Railroad along a portion of the western edge of the City of Healdsburg (City). Pathway features are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control.

Any information provided will be used in an *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) to determine if significant archaeological resources may be affected by the proposed project. The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

March 9, 2018

BASIN RESEARCH ASSOCIATES
1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Mr. Chris Wright, Chairperson
Dry Creek Rancheria Band of Pomo Indians
P.O. Box 607
Geyserville, CA 95441

RE: Request for Information
Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County

Dear Chris,

The Native American Heritage Commission (NAHC) has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map). **The NAHC *Sacred Lands File Search* noted the presence of Sacred Sites within the project Area of Potential Effect (APE).**

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved bicycle and pedestrian path/trail within an existing public right of way and easements. The project proposes to extend the existing north-south pathway parallel Foss Creek and/or the Northwestern Pacific Railroad along a portion of the western edge of the City of Healdsburg (City). Pathway features are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control.

Any information provided will be used in an *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) to determine if significant archaeological resources may be affected by the proposed project. The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

BASIN RESEARCH ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

March 9, 2018

Mr. Gene Buvelot
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: Request for Information
Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County

Dear Gene,

The Native American Heritage Commission (NAHC) has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map). **The NAHC *Sacred Lands File Search* noted the presence of Sacred Sites within the project Area of Potential Effect (APE).**

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved bicycle and pedestrian path/trail within an existing public right of way and easements. The project proposes to extend the existing north-south pathway parallel Foss Creek and/or the Northwestern Pacific Railroad along a portion of the western edge of the City of Healdsburg (City). Pathway features are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control.

Any information provided will be used in an *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) to determine if significant archaeological resources may be affected by the proposed project. The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

March 9, 2018

BASIN
RESEARCH
ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Mr. Greg Sarris, Chairperson
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928

RE: Request for Information
Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County

Dear Greg,

The Native American Heritage Commission (NAHC) has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map). **The NAHC *Sacred Lands File Search* noted the presence of Sacred Sites within the project Area of Potential Effect (APE).**

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved bicycle and pedestrian path/trail within an existing public right of way and easements. The project proposes to extend the existing north-south pathway parallel Foss Creek and/or the Northwestern Pacific Railroad along a portion of the western edge of the City of Healdsburg (City). Pathway features are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control.

Any information provided will be used in an *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) to determine if significant archaeological resources may be affected by the proposed project. The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

March 9, 2018

BASIN RESEARCH ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Chairperson
Kashia Band of Pomo Indians of the Stewarts Point Rancheria
1420 Guerneville Road, Suite 1
Santa Rosa, CA 95403

RE: Request for Information
Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County

Dear Chairperson,

The Native American Heritage Commission (NAHC) has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map). **The NAHC *Sacred Lands File Search* noted the presence of Sacred Sites within the project Area of Potential Effect (APE).**

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved bicycle and pedestrian path/trail within an existing public right of way and easements. The project proposes to extend the existing north-south pathway parallel Foss Creek and/or the Northwestern Pacific Railroad along a portion of the western edge of the City of Healdsburg (City). Pathway features are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control.

Any information provided will be used in an *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) to determine if significant archaeological resources may be affected by the proposed project. The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

March 9, 2018

BASIN
RESEARCH
ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Ms. Marjorie Meiia, Chairperson
Lytton Rancheria of California
437 Aviation Blvd.
Santa Rosa, CA 95403

RE: Request for Information
Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County

Dear Marjorie,

The Native American Heritage Commission (NAHC) has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map). **The NAHC *Sacred Lands File Search* noted the presence of Sacred Sites within the project Area of Potential Effect (APE).**

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved bicycle and pedestrian path/trail within an existing public right of way and easements. The project proposes to extend the existing north-south pathway parallel Foss Creek and/or the Northwestern Pacific Railroad along a portion of the western edge of the City of Healdsburg (City). Pathway features are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control.

Any information provided will be used in an *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) to determine if significant archaeological resources may be affected by the proposed project. The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

March 9, 2018

BASIN
RESEARCH
ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

Mr. Jose Simon III, Chairperson
Middletown Rancheria
P.O. Box 1035
Middletown, CA 95461

RE: Request for Information
Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County

Dear Jose,

The Native American Heritage Commission (NAHC) has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map). **The NAHC *Sacred Lands File Search* noted the presence of Sacred Sites within the project Area of Potential Effect (APE).**

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved bicycle and pedestrian path/trail within an existing public right of way and easements. The project proposes to extend the existing north-south pathway parallel Foss Creek and/or the Northwestern Pacific Railroad along a portion of the western edge of the City of Healdsburg (City). Pathway features are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control.

Any information provided will be used in an *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) to determine if significant archaeological resources may be affected by the proposed project. The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

BASIN
RESEARCH
ASSOCIATES

1933 DAVIS STREET
SUITE 210
SAN LEANDRO, CA 94577
VOICE (510) 430-8441
FAX (510) 430-8443

March 9, 2018

Scott Gabaldon, Chairperson,
Mishewal-Wappo Tribe of Alexander Valley
2275 Silk Road
Windsor, CA 95492

RE: Request for Information
Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County

Dear Scott,

The Native American Heritage Commission (NAHC) has provided your name as an individual who may have information regarding Native American sites within or adjacent to the above proposed project (see enclosed USGS map). **The NAHC *Sacred Lands File Search* noted the presence of Sacred Sites within the project Area of Potential Effect (APE).**

The Foss Creek Pathway (Pathway) is a Class I (off-street) paved bicycle and pedestrian path/trail within an existing public right of way and easements. The project proposes to extend the existing north-south pathway parallel Foss Creek and/or the Northwestern Pacific Railroad along a portion of the western edge of the City of Healdsburg (City). Pathway features are to include 10' wide asphalt concrete paved pathway, decorative LED lighting, two creek/water crossings, fencing, site furniture (benches, trash receptacles, pet waste bag dispensers, etc.) and an enhanced safety crossing at Dry Creek Road featuring on-demand signalized traffic control.

Any information provided will be used in an *Historic Property Survey Report/Finding of Effect* report (HPSR/FOE) to determine if significant archaeological resources may be affected by the proposed project. The U.S. Army Corps of Engineers (San Francisco District) will review the project and issue a 404 Permit due to possible wetland modifications.

If I can provide any further information, please don't hesitate to contact me (510 430-8441 or Basinres1@gmail.com). Thank you for your timely review of our request.

BASIN RESEARCH ASSOCIATES, INC.

Colin I. Busby, Ph.D., RPA
Principal

CIB/dg

Subject: Foss Creek Pathway, Healdsburg
From: <lorin@stewartspoint.org>
Date: 3/16/2018, 5:05 PM
To: Basinres1@gmail.com

Colin;

The Proposed Foss Creek Pathway Project in Healdsburg, Ca. is out of the Aboriginal Territory of the Stewarts Point Rancheria Kashia Band of Pomo Indians.

We do not have any concerns or comments at this time.

Thank You,

Lorin W. Smith, Jr.
Tribal Historic Preservation Officer
1420 Guerneville Road, Suite 1
Santa Rosa CA 95403
Email: lorin@stewartspoint.org
Office: 707-591-0580 x 105
Cell: 707-321-7064

Subject: Foss Creek Pathway
From: "THPO@gratonrancheria.com" <THPO@gratonrancheria.com>
Date: 3/15/2018, 3:00 PM
To: "Colin Busby (Basinres1@gmail.com)" <Basinres1@gmail.com>

Dear Colin Busby,

The Federated Indians of Graton Rancheria, a federally recognized Tribe and sovereign government has received your correspondence requesting information on a project located at Foss Creek Pathway. The Tribe has reviewed the location of the project and we have determined it is not in our traditional ancestral territory, therefore have no comments on this project, at this time. We appreciate the opportunity to review the project proposal. If you have any additional questions regarding this letter please feel free to email my office at thpo@gratonrancheria.com or call the office at (707) 566-2288.

Sincerely,
Buffy McQuillen
Tribal Heritage Preservation Officer (THPO)
Native American Graves Protection and Repatriation Act (NAGPRA)
Office: 707.566.2288; ext. 137
Cell: 707.318.0485
FAX: 707.566.2291

Antonette Tomic
THPO Administrative Assistant
Federated Indians of Graton Rancheria
6400 Redwood Drive, Suite 300
Rohnert Park, CA 94928
Office: 707.566.2288, ext. 143
Fax: 707.566.2291
atomic@gratonrancheria.com

Middletown Rancheria
Tribal Historic Preservation Department
P.O. Box 1035
Middletown, CA 95461

April 4, 2018

Basin Research Associates
Colin I. Busby, Ph.D., RPA
1933 Davis Street Suite 210
San Leandro, California 94577

Re: Request for Information
Foss Creek Pathway, Section 7-8, City of Healdsburg, Sonoma County, California.

Dear Mr. Busby:

The Middletown Rancheria (Tribe) is in receipt of your letter dated, March 9, 2018, regarding the Request for Information, Foss Creek Pathway, Sections 7-8, City of Healdsburg, Sonoma County, California .

Though we have no specific comments at this time, should any new information or evidence of human habitation be found as the project progresses, we request that all work cease and that you contact us immediately. We do have a process to protect such important and sacred resources.

Thank you for the opportunity to provide comments to the above referenced project. The Tribe looks forward to continuing to be a part of the County's process.

Nothing herein should be construed to be a waiver of or limitation of any of the Tribe's rights in law, in equity, or otherwise. All rights, claims and remedies are specifically reserved.

Should you have any questions, please do not hesitate to contact me.

Sincerely,

Stephanie L. Reyes
Tribal Historic Preservation Officer
Middletown Rancheria

CALIFORNIA HISTORICAL RESOURCES INFORMATION SYSTEM

ALAMEDA
COLUSA
CONTRA COSTA
DEL NORTE
HUMBOLDT
LAKE
MARIN
MENDOCINO
MONTEREY
NAPA
SAN BENITO
SAN FRANCISCO
SAN MATEO
SANTA CLATA
SANTA CRUZ
SOLANO
SONOMA
YOLO

Northwest Information Center
Sonoma State University
150 Professional Center Drive, Suite E
Rohnert Park, California 94928-3609
Tel: 707.588.8455
nwic@sonoma.edu
http://www.sonoma.edu/nwic

3/21/2018 NWIC File No.: 17-2138

Donna M. Garaventa
Basin Research Associates
1933 Davis Street, Suite 210
San Leandro, CA 94577

Re: Foss Creek Pathway

The Northwest Information Center received your record search request for the project area referenced above, located on the Geyserville, Jimtown, Guerneville, and Healdsburg USGS 7.5’ quad(s). The following reflects the results of the records search for the project area and a ¼ mi. radius:

Resources within project area:	P-49-002696, P-49-002834
Resources within ¼ mi. radius:	P-49-002172, P-49-002173, P-49-002273, P-49-002275, P-49-003017, P-49-003699, P-49-004258, P-49-004752
Reports within project area:	S-5799, 9741, 10496, 13217, 22483, 22736, 24601, 25066, 25104, 25217, 28098, 31737, 38966, 38968
Reports within ¼ mi. radius:	S-688, 2089, 9557, 9948, 10982, 12517, 19685, 20374, 30294, 30952, 31218, 31352, 32183, 34197, 34328, 37408, 45474
Other Reports within records search radius:	Included is a list of the 19 “Other Reports” within or encompassing your project area. These reports are classified as Other Reports; reports with little or no field work or missing maps. The electronic maps do not depict study areas for these reports, however a list of these reports has been provided. In addition, you have not been charged any fees associated with these studies.

Resource Database Printout (list):		☒ enclosed	☐ not requested	☐ nothing listed
Resource Database Printout (details):		☒ enclosed	☐ not requested	☐ nothing listed
Resource Digital Database Records:		☐ enclosed	☒ not requested	☐ nothing listed
Report Database Printout (list):		☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):		☒ enclosed	☐ not requested	☐ nothing listed
Report Digital Database Records:		☐ enclosed	☒ not requested	☐ nothing listed
Resource Record Copies:	[as requested]	☐ enclosed	☐ not requested	☐ nothing listed
Report Copies:	[as requested]	☐ enclosed	☐ not requested	☐ nothing listed
OHP Historic Properties Directory:		☒ enclosed	☐ not requested	☐ nothing listed

Archaeological Determinations of Eligibility:	☐ enclosed	☐ not requested	☒ nothing listed
CA Inventory of Historic Resources (1976):	☐ enclosed	☒ not requested	☐ nothing listed
Caltrans Bridge Survey: **	☐ enclosed	☒ not requested	☐ nothing listed
Ethnographic Information:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Literature:	☐ enclosed	☒ not requested	☐ nothing listed
Historical Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Local Inventories:	☐ enclosed	☒ not requested	☐ nothing listed
GLO and/or Rancho Plat Maps:	☐ enclosed	☒ not requested	☐ nothing listed
Shipwreck Inventory: **	☐ enclosed	☒ not requested	☐ nothing listed

*Notes:
** Current versions of these resources are available on-line:
Caltrans Bridge Survey: http://www.dot.ca.gov/hq/structur/strmaint/historic.htm
Soil Survey: http://www.nrcs.usda.gov/wps/portal/nrcs/surveylist/soils/survey/state/?stateId=CA
Shipwreck Inventory: http://www.slc.ca.gov/Info/Shipwrecks.html

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Annette Neal

Researcher

APPENDIX E

Traffic Memorandum

KITTELSON & ASSOCIATES

2110 K STREET, SUITE 22
SACRAMENTO, CA 95816
P 916.266.2190 F 916.266.2195

MEMORANDUM

Date:	March 15, 2019	Project #: 21313
To:	Heidi Utterback, PE Coastland Engineering 1400 Neotomas Avenue Santa Rosa, CA 95405	
From:	Matt Braughton, Lilian Wu, PhD	
Project:	Foss Creek Pathway	
Subject:	Pedestrian Signal Traffic Impact Analysis	

INTRODUCTION

This memorandum documents the traffic and safety analysis evaluating existing and cumulative conditions for the proposed pedestrian signal on Dry Creek Road between Grove Street and Healdsburg Avenue in Healdsburg, CA in conjunction with the Foss Creek Pathway. A new mid-block signalized pedestrian crossing is proposed to the west of the existing rail line. The analysis was conducted to model and evaluate the potential traffic impacts of the proposed pedestrian actuation crossing on intersection delay and queueing for the Grove Street and Healdsburg Avenue intersections on Dry Creek Road.

METHODOLOGY

Traffic Volumes

Intersection traffic counts for vehicles, pedestrians, and bicycles were collected on Tuesday, May 8, 2018 from 7:00 to 9:00 AM and from 4:00 to 6:00 PM, for the two intersections. Directional segment counts were collected on Dry Creek Road from January 25th to January 31st, 2019. Due to equipment malfunction and the subsequent construction and associated road work associated with the Hotel Trio Healdsburg, the PM peak hour counts at Dry Creek Road and Grove Street Intersection counts were re-collected on Tuesday, February 12, 2019.

The study intersections are shown in Figure 1. Based on these counts, the AM and PM peak hours were identified for each intersection. Appendix A contains the count data summaries. The AM and PM peak hour turning-movement volumes collected for this project were used to conduct a LOS analysis using the HCM 2000 methodologies as implemented in Synchro 10.

Level of Service Methodology

Level of service (LOS) is a concept in the *Highway Capacity Manual* (HCM) which was developed to quantify the quality of service (including such elements as travel time, number of stops, total amount of stopped delay, and impediments caused by other vehicles) afforded to drivers as they travel through an intersection or roadway segment. Six grades are used to denote the various level of service from “A” to “F” based on the amount of delay the average driver can expect to have at the intersection. Table 1 shows the LOS service levels associated with signalized intersections. The criteria are based on the average intersection delay per vehicle at the intersections.

Table 1: Level of Service Criteria for Signalized Intersections

Level of Service	Average Control Delay per Vehicle (Seconds)
A	<10.0
B	>10.0 and ≤ 20.0
C	>20.0 and ≤ 35.0
D	>35.0 and ≤ 55.0
E	>55.0 and ≤ 80.0
F	>80.0

Source: Highway Capacity Manual.

Significant Impact Criteria

The Healdsburg 2030 General Plan Policy Document establishes the following Level of Service standards for the City:

> *The City shall strive to maintain at least a Level of Service (LOS) D operation during periods of peak traffic flow at critical intersections, and Level of Service C operation at all other times. These standards shall apply only to intersections of an arterial street with either another arterial or a collector street and intersections of two collector streets. LOS F operation shall be acceptable for a stop-controlled approach to a through street provided the higher levels of delay affect 25 or fewer vehicles per hour. Attainment of these levels of service shall be consistent with the financial resources available and the limits of technical feasibility. The following table indicates the standards described above based on the methodologies detailed in the Highway Capacity Manual 2000.*

Table 2: Healdsburg Minimum Level of Service Standards

Type of Control	Peak Periods	Off-Peak Periods
Signalized	D	C
All-Way Stop Controlled	D	C
Unsignalized – Worst Approach	E	D

Source: Healdsburg 2030 General Plan Policy Document, 2015.

An impact on intersection operation would be considered significant if:

- The addition of the pedestrian crossing degrades peak period intersection operations at Grove Street & Dry Creek Road or Healdsburg Avenue & Dry Creek Road to LOS E or F with the project; or,
- The LOS without the project is LOS E or F and the addition of the pedestrian crossing would increase the peak period average vehicle delay at the study intersections by 5 seconds or more.

Figure 1: Study Intersections

Coordinate System: NAD 1983 StatePlane California II FIPS 0402 Feet
Data Source: County of Sonoma, 2019

EXISTING CONDITIONS RESULTS

Daily Volumes

Table 3 summarizes the existing traffic and speed information on the Dry Creek Road segment between Grove Street and the railroad crossing. Average daily traffic (ADT) is based on one-week counts from January 25th to January 31st, 2019. Speed data were collected for the same week and same segment to obtain the 85th percentile speeds as shown in Table 3.

Table 3: Existing Daily Traffic Segment Volumes and Speed Surveys

Segment	Direction	ADT	Year	85th Percentile Speed (mph)	Year	Speed Limit (mph)
Dry Creek Road between Grove Street and Railroad Crossing	WB	6,480	2019	31	2019	35
Dry Creek Road between Grove Street and Railroad Crossing	EB	6,126	2019	33		

Source: Kittelson & Associates, Inc., 2019.

Operational Analysis

Table 4 presents the Synchro 10 LOS and delay results for existing conditions for both the Existing Conditions No Project and Existing Conditions Plus Project. The Plus Project scenario includes a pedestrian crossing signal for the Foss Creek Pathway between the two study intersections on Dry Creek Road, Grove Street and Healdsburg Avenue. The proposed pedestrian crossing signal would be located just west of the existing railroad crossing.

The pedestrian crossing signal is analyzed as an actuated but uncoordinated signal with a cycle length of 50 seconds. As a result, the signal will only activate for pedestrians to cross at most every 50 seconds. The pedestrian crossing phase, when actuated, is modeled with a 7 second "WALK" time and 13 seconds of "Flashing, DO NOT WALK" time. Under these conditions, there would be a minimum of 30 seconds between pedestrian crossing phases. Pedestrian demand for the crossing was conservatively assumed at 50 pedestrian crossing phase calls per hour such that half of the cycles in the peak hour have a pedestrian actuation. The peak hour factors (PHF) and heavy vehicle percentages for the pedestrian crossing are assumed to be the same as those for the intersection of Dry Creek Road and Grove Street.

Table 4: Synchro Intersection Analysis Results – Existing Conditions Delay and LOS

ID*	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (seconds)	Level of Service	Delay (seconds)	Level of Service
Existing No Project					
3	Grove St & Dry Creek Rd	15.6	B	14.9	B
6	Healdsburg Ave & Dry Creek Rd	27.0	C	30.5	C
Existing Plus Project					
3	Grove St & Dry Creek Rd	15.6	B	14.9	B
6	Healdsburg Ave & Dry Creek Rd	27.0	C	30.5	C
9	Proposed Pedestrian Crossing	2.5	A	2.2	A

Source: Kittelson & Associates, Inc., 2019.
*: ID numbers correspond to the Synchro reports.

The results of the analysis indicate the study intersections operate at an acceptable LOS in the Existing scenarios in both the AM and PM traffic conditions. The results for the two existing intersections are not changed by adding the new pedestrian crossing as no additional volume is added to the network.

Table 5 summarizes the 50th and 95th percentile queue length outputs from the existing conditions scenarios for the approaches that will be impacted by the new pedestrian crossing at the study intersections.

Table 5: Synchro Queue Length Results – Existing Conditions

<table>
<tr><th>ID</th><th>Intersection</th><th>Movement</th><th>Storage Length (ft.)</th><th>Period</th><th>50th Queue (ft.)</th><th>95th Queue (ft.)</th></tr>
<tr><td rowspan="2">3</td><td rowspan="2">Grove St & Dry Creek Rd</td><td rowspan="2">WBT</td><td rowspan="2">380</td><td>AM</td><td>119</td><td>290#</td></tr>
<tr><td>PM</td><td>120</td><td>322#</td></tr>
<tr><td rowspan="2">6</td><td rowspan="2">Healdsburg Ave & Dry Creek Rd</td><td>EBT</td><td rowspan="2">360</td><td>AM</td><td>112</td><td>211</td></tr>
<tr><td>EBL</td><td>PM</td><td>95</td><td>247#</td></tr>
<tr><td rowspan="4">9</td><td rowspan="4">Proposed Pedestrian Crossing</td><td rowspan="2">WBT</td><td rowspan="2">360</td><td>AM</td><td>0</td><td>214</td></tr>
<tr><td>PM</td><td>0</td><td>227</td></tr>
<tr><td rowspan="2">EBT</td><td rowspan="2">380</td><td>AM</td><td>0</td><td>93</td></tr>
<tr><td>PM</td><td>0</td><td>80</td></tr>
</table>

Source: Kittelson & Associates, Inc., 2019.
Notes:
*:ID numbers correspond to the Synchro reports.
Bold and Grey Cells indicate the 95th percentile volume exceeds the available storage between the signal and the new pedestrian crossing/rail crossing (whichever is closer).
#: 95th percentile volume exceeds capacity, queue may be longer.

The results for the two existing intersections are not changed by adding the new pedestrian crossing. Under existing traffic conditions, the 50th percentile queue lengths for the eastbound or westbound movements are within the storage length. The westbound through movement at Grove Street and the eastbound left movement at Healdsburg Avenue could potentially result in 95th percentile queue lengths longer than those reported when volume exceeds capacity. However, none of the movements are expected to exceed capacity in the analysis scenarios. The 95th percentile queue lengths at the new pedestrian crossing signal do not exceed available storage.

The Synchro 10 output worksheets with LOS and queue length results are provided in Appendix B.

Crash Analysis

The most recent five years of complete crash data (2013 to 2017) from the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS) were reviewed for the study area. Table 6 shows the crash history by location and crash severity. There were 34 crashes during the study period. Of these, 33 occurred within the influence area[1] of the study intersections with 16 crashes at Grove Street & Dry Creek Road, and 17 crashes at Healdsburg Avenue & Dry Creek Road. Nine crashes resulted in an injury. There were no fatal or severe injury crashes during the period evaluated.

Table 6: Study Area Crash History, 2013-2017

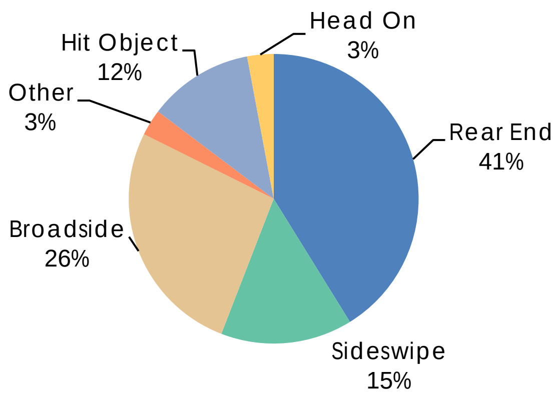
Location	Total Crashes	Other Visible Injury	Complaint of Pain Injury	Property Damage Only
Grove St & Dry Creek Rd	16	2	3	11
Healdsburg Ave & Dry Creek Rd	17	1	3	13
Dry Creek Road between Grove Street & Healdsburg Avenue	1	0	0	1
Total	34	3	6	25

Source: California Highway Patrol, Statewide Integrated Traffic Records System, 2019.

[1] Caltrans defines the influence area of an intersection as within 250 feet on any approach.

Figure 2 shows crashes within the study area by crash type. Rear end crashes (41%) were the most common crash type, followed by Broadside (26%) and Sideswipe (15%). There were four Hit Object crashes as well as one Head On and one Other crash during the study period.

Figure 2: Crash History by Crash Type, 2013-2017



Source: California Highway Patrol, Statewide Integrated Traffic Records System, 2019.

The crash history is consistent with expected patterns at signalized intersections. No crash pattern was identified for consideration in conjunction with the addition of the signalized pedestrian crossing.

CUMULATIVE CONDITIONS RESULTS

Daily Volumes

Traffic growth for the cumulative condition in 2040 were estimated based on the model volume plots from the latest version of the Sonoma County Transportation Authority's travel demand model. Table 7 lists the growth rates and forecasted directional peak hour volumes on each segment of the study intersections. The movements coming in to and out of the Dry Creek Road segment between Grove Street and Healdsburg Avenue are controlled by the annual growth rates specified for this segment. All other movements for Grove Streets and Healdsburg Avenue are projected using the annual growth rates for the corresponding segment.

Movement-specific forecasts can be found in the Synchro 10 output worksheets in Appendix C.

Table 7: Cumulative Condition (2040) Traffic Forecast

Segment	Direction	AM		PM	
		Annual Growth Rate	Peak Hour Volume	Annual Growth Rate	Peak Hour Volume
Dry Creek Road between Grove Street and Railroad Crossing	WB	1%	700	2%	950
Dry Creek Road between Grove Street and Railroad Crossing	EB	3%	1,170	1%	730
Grove Street north of Dry Creek Road	SB	1.5%	320	1.5%	360
Grove Street south of Dry Creek Road	NB		260		380
Healdsburg Ave north of Dry Creek Road	SB	1%	520	3%	840
Healdsburg Ave south of Dry Creek Road	NB	1%	530	1%	770

Source: Kittelson & Associates, Inc., 2019.

Operational Analysis

The Synchro analysis for cumulative conditions applied the same input parameters as the existing conditions scenarios for signal timing plans, heavy vehicle percentages, and peak hour factors. The input traffic volumes were updated for 2040. The signal timing for the proposed pedestrian crossing signal was optimized for a 60-second cycle length under future conditions. The estimated pedestrian demand assumption remained at the conservative 50 pedestrian phase calls per hour.

Table 8 presents the LOS and delay results of the Synchro cumulative conditions analysis for both the Cumulative No Project and Cumulative Plus Project scenarios.

Table 8: Synchro Intersection Analysis Results – Cumulative Conditions Delay and LOS

ID*	Intersection	AM Peak Hour		PM Peak Hour	
		Delay (seconds)	Level of Service	Delay (seconds)	Level of Service
Cumulative No Project					
3	Grove St & Dry Creek Rd	27.1	C	49.9	D
6	Healdsburg Ave & Dry Creek Rd	**64.2**	**E**	**89.3**	**F**
Cumulative Plus Project					
3	Grove St & Dry Creek Rd	27.1	C	49.9	D
6	Healdsburg Ave & Dry Creek Rd	**64.2**	**E**	**89.3**	**F**
9	Proposed Pedestrian Crossing	3.8	A	4.1	A

Source: Kittelson & Associates, Inc., 2019.
*:ID numbers correspond to the Synchro reports.

The intersection at Healdsburg Avenue & Dry Creek Road would operate at LOS F during the PM peak hour in the Cumulative No Project and Cumulative Plus Project scenarios. The addition of the uncoordinated pedestrian crossing signal does not result in any change in the LOS and queue length results at the two study intersections.

Table 9 summarizes the 50th and 95th percentile queue length outputs from the Cumulative conditions for the approaches that will be impacted by the new pedestrian crossing at the study intersections. The results for the two existing intersections are not changed by adding the new pedestrian crossing.

Table 9: Synchro Queue Length Results – Cumulative Conditions

ID	Intersection	Movement	Storage Length (ft.)	Period	50th Queue (ft.)	95th Queue (ft.)
3	Grove St & Dry Creek Rd	WBT	380	AM	167	**447#**
				PM	255	**633#**
6	Healdsburg Ave & Dry Creek Rd	EBT	360	AM	**374~**	**585#**
		EBL		PM	195~	**378#**
9	Proposed Pedestrian Crossing	WBT	360	AM	195	304
				PM	274	**451**
		EBT	380	AM	155	203
				PM	65	90

Source: Kittelson & Associates, Inc., 2019.
Notes:
*:ID numbers correspond to the Synchro reports.
Bold and Grey Cells indicate the 95th percentile volume exceeds the available storage between the signal and the new pedestrian crossing/rail crossing (whichever is closer).
#: 95th percentile volume exceeds capacity, queue may be longer.
~: Volume exceeds capacity, queue is theoretically infinite.

Under cumulative traffic conditions, the 50th percentile queue lengths for eastbound through traffic at Healdsburg Avenue and Dry Creek Road are likely to be longer than the available storage between the study intersection and the new crossing. The relevant 95th percentile queue lengths are likely to exceed available storage for both signalized intersections. However, the queues would not exceed the available storage between the two signalized intersections with vehicles queuing beyond the new pedestrian crossing signal, so no queue spillback between intersections is expected.

At the proposed pedestrian crossing, the 95th percentile queue length in the westbound direction will likely exceed the available storage length for one lane between the pedestrian crossing stop bar and Healdsburg Avenue. However, there is sufficient storage when the storage for the second lane that is dropped at the Big John’s Market driveway is included as available queue storage. When this second lane is included, there is up to 520 feet of storage available, well above the expected 451 feet of queue length.

The Synchro output with LOS and queue length results is provided in Appendix C.

SUMMARY

Operations

The study intersections operate at an acceptable LOS (LOS D or better) during the weekday AM and PM peak hours under existing traffic conditions. Under cumulative traffic conditions, the Healdsburg Avenue & Dry Creek Road intersection would operate at LOS F in the PM peak hours in 2040. However, this is independent of the proposed signalized pedestrian crossing and there is no significant impact identified as a result of traffic operations.

Queuing

The 95^{th} percentile queue lengths will exceed available storage along the Dry Creek Road segment between Grove Street and Healdsburg Avenue at the following locations in the cumulative condition:

- Grove St & Dry Creek Rd: westbound in the AM and PM peak hours;
- Healdsburg Ave & Dry Creek Rd: eastbound in the AM peak hour and eastbound left in the PM peak hour;
- The proposed pedestrian crossing signal: westbound in the PM peak hour.

However, these queues can be accommodated if queues are allowed to extend past the pedestrian crossing signal for queues resulting from the signals at Grove Street and Healdsburg Avenue. In the case of the pedestrian crossing signal, if the storage length of the Dry Creek Road westbound lane drop east of Healdsburg Avenue is considered as queue storage the westbound queues from the pedestrian signal could be accommodated with no impact on the Healdsburg Avenue signal. This queue impact will depend on driver behavior and lane utilization.

Impacts

Queues as a result of the cumulative conditions growth may result in an impact with westbound queues exceeding available storage for the pedestrian crossing during the PM peak hour depending on driver behavior and lane utilization. No significant impact is identified based on the City's LOS standards with the addition of the pedestrian crossing signal at the existing rail crossing. The pedestrian signal is not expected to worsen level of service or add additional delay at either signal in any scenario.

Recommendations

Potential mitigations to reduce queueing impacts at the two signals and the proposed pedestrian crossing include:

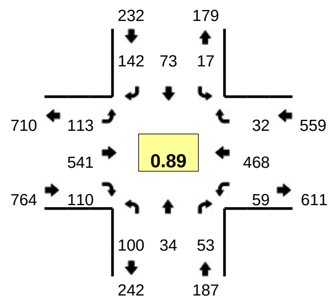
- Optimizing the signal plans at the two study intersections to account for future traffic demand;
- Interconnecting the pedestrian signal with the two study intersections to reduce queueing impacts; and,
- Installing detectors on both sides of the rail/pedestrian crossing in both directs to detect when queues may extend across the rail crossing to trigger the signals to flush queued traffic.

APPENDIX A: COUNT DATA

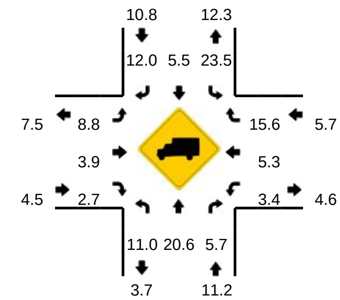
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

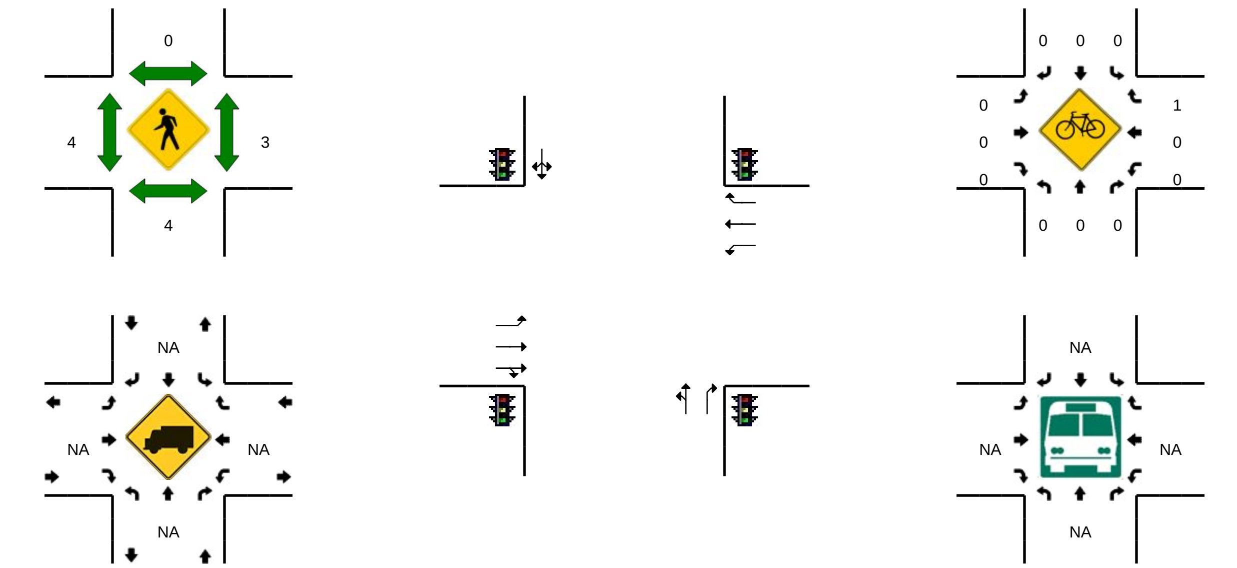
LOCATION: Grove St -- Dry Creek Rd | **QC JOB #:** 14698201

CITY/STATE: Healdsburg, CA | **DATE:** Tue, May 08 2018



Peak-Hour: 7:35 AM -- 8:35 AM
Peak 15-Min: 7:45 AM -- 8:00 AM





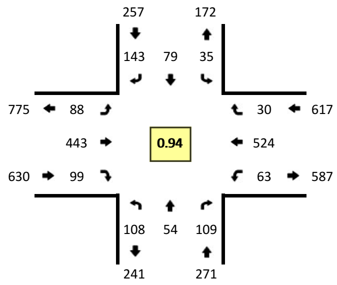
5-Min Count Period Beginning At	Grove St (Northbound) Left	Thru	Right	U	Grove St (Southbound) Left	Thru	Right	U	Dry Creek Rd (Eastbound) Left	Thru	Right	U	Dry Creek Rd (Westbound) Left	Thru	Right	U	Total	Hourly Totals
7:00 AM	5	2	4	0	1	3	12	0	10	36	13	0	3	17	2	0	108	
7:05 AM	4	3	2	0	0	3	17	0	12	31	2	0	2	31	1	0	108	
7:10 AM	10	1	3	0	0	3	6	0	14	38	6	0	3	30	3	0	117	
7:15 AM	5	3	5	0	0	2	10	0	8	28	8	0	1	33	1	0	104	
7:20 AM	4	1	2	0	2	4	11	0	10	29	6	0	4	38	1	0	112	
7:25 AM	5	3	4	0	2	2	12	0	8	33	9	0	4	47	1	0	130	
7:30 AM	5	2	2	0	1	3	12	0	7	30	6	0	3	35	2	0	108	
7:35 AM	4	3	6	0	1	3	6	0	8	45	10	0	3	37	3	0	129	
7:40 AM	9	0	5	0	1	7	14	0	7	46	9	0	3	32	2	0	135	
7:45 AM	11	2	2	0	1	2	14	0	14	62	4	0	5	39	0	0	156	
7:50 AM	5	4	2	0	1	14	12	0	13	51	11	0	6	33	1	0	153	
7:55 AM	9	0	7	0	2	8	16	0	14	63	6	0	8	43	3	0	179	1539
8:00 AM	7	1	3	0	2	5	10	0	11	43	13	0	8	29	6	0	138	1569
8:05 AM	13	5	3	0	1	3	7	0	6	38	8	0	8	60	2	0	154	1615
8:10 AM	13	6	3	0	2	6	13	0	1	42	8	0	4	36	4	0	138	1636
8:15 AM	4	4	7	0	1	6	17	0	8	40	8	0	2	41	3	0	141	1673
8:20 AM	8	4	7	0	1	4	10	0	5	33	11	0	3	45	4	0	135	1696
8:25 AM	7	2	3	0	3	4	13	0	15	40	9	0	4	49	3	0	152	1718
8:30 AM	10	3	5	0	1	11	10	0	11	38	13	0	5	24	1	0	132	1742
8:35 AM	2	0	9	0	1	5	12	0	6	38	5	0	2	21	2	0	103	1716
8:40 AM	9	5	8	0	0	3	10	0	11	34	13	0	2	30	1	0	126	1707
8:45 AM	3	3	3	0	1	4	9	0	12	38	9	0	5	40	0	0	127	1678
8:50 AM	6	5	6	0	1	12	8	0	11	46	11	0	5	34	0	0	145	1670
8:55 AM	7	2	3	0	0	10	8	0	10	56	13	0	5	37	6	0	157	1648

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	100	24	44	0	16	96	168	0	164	704	84	0	76	460	16	0	1952
Heavy Trucks	8	8	4		0	4	8		4	28	0		4	28	4		100
Pedestrians		0				0				4				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	1		1
Railroad																	
Stopped Buses																	

Comments:

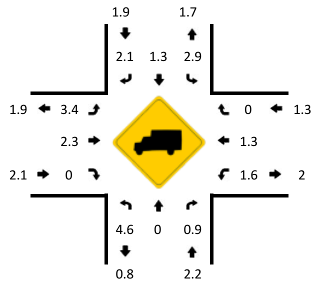
Type of peak hour being reported: Intersection Peak — Method for determining peak hour: Total Entering Volume

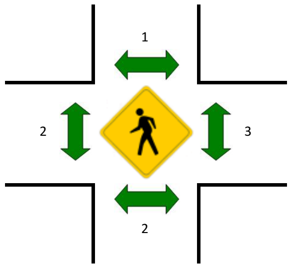
LOCATION: Grove St -- Dry Creek Rd — **QC JOB #:** 14698202
CITY/STATE: Healdsburg, CA — **DATE:** Tue, Feb 12 2019

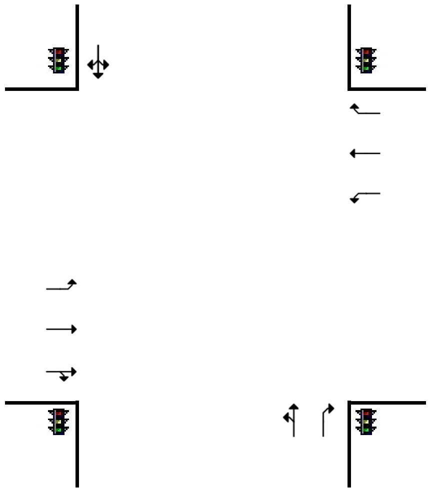


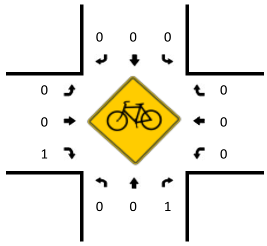
Peak-Hour: 4:30 PM -- 5:30 PM

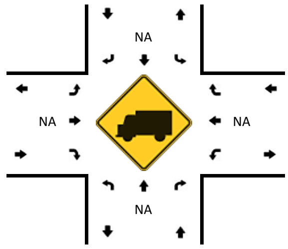
Peak 15-Min: 4:35 PM -- 4:50 PM

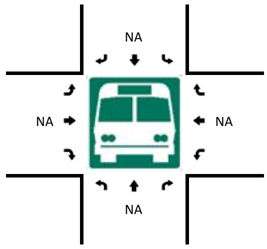












5-Min Count Period Beginning At	Grove St (Northbound)				Grove St (Southbound)				Dry Creek Rd (Eastbound)				Dry Creek Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	5	0	7	0	4	12	15	0	6	48	7	0	3	60	5	0	172	
4:05 PM	18	5	10	0	4	11	14	0	5	33	6	0	5	50	3	0	164	
4:10 PM	5	1	7	0	0	6	5	0	15	46	7	0	2	50	3	0	147	
4:15 PM	7	5	5	0	1	5	8	0	10	28	10	0	7	40	2	0	128	
4:20 PM	11	3	8	0	4	5	8	0	10	23	10	0	4	31	1	0	118	
4:25 PM	11	2	5	0	3	7	8	0	11	40	10	0	5	39	1	0	142	
4:30 PM	12	4	7	0	2	5	10	0	9	36	7	0	7	38	3	0	140	
4:35 PM	8	7	13	0	3	6	17	0	8	43	11	0	6	48	2	0	172	
4:40 PM	15	4	8	0	2	5	12	0	8	45	3	0	3	48	4	0	157	
4:45 PM	8	3	9	0	2	5	9	0	5	38	10	0	5	45	2	0	141	
4:50 PM	9	7	10	0	5	14	15	0	12	32	8	0	6	33	4	0	155	
4:55 PM	4	3	5	0	2	3	6	0	7	39	12	0	4	47	5	0	137	1773
5:00 PM	12	4	14	0	2	10	14	0	7	27	9	0	4	53	0	0	156	1757
5:05 PM	10	6	5	0	5	8	15	0	5	29	8	0	5	49	5	0	150	1743
5:10 PM	6	5	14	0	2	7	19	0	9	32	11	0	8	47	2	0	162	1758
5:15 PM	8	4	6	0	4	7	9	0	4	37	5	0	5	42	2	0	133	1763
5:20 PM	6	4	9	0	4	6	8	0	5	41	7	0	5	32	0	0	127	1772
5:25 PM	10	3	9	0	2	3	9	0	9	44	8	0	5	42	1	0	145	1775
5:30 PM	6	3	5	0	1	1	8	0	7	30	8	0	6	34	0	0	109	1744
5:35 PM	13	3	8	0	0	5	6	0	7	33	5	0	3	42	3	0	128	1700
5:40 PM	5	1	6	0	1	3	10	0	5	26	4	0	5	39	1	0	106	1649
5:45 PM	9	6	2	0	0	9	10	0	8	30	4	0	6	36	3	0	123	1631
5:50 PM	4	2	4	0	0	7	6	0	3	39	5	0	8	39	2	0	119	1595
5:55 PM	6	2	7	0	0	2	3	0	5	32	5	0	5	36	6	0	109	1567

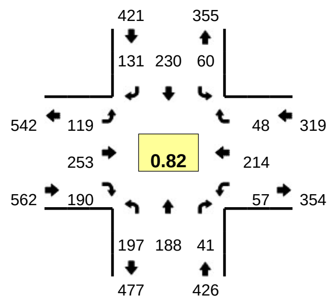
Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	124	56	120	0	28	64	152	0	84	504	96	0	56	564	32	0	1880
Heavy Trucks	8	0	0		0	0	4		4	4	0		0	12	0		32
Pedestrians		8				0				4				0			12
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

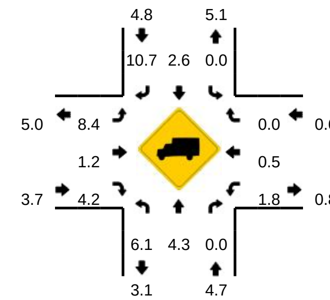
Report generated on 2/13/2019 11:49 AM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

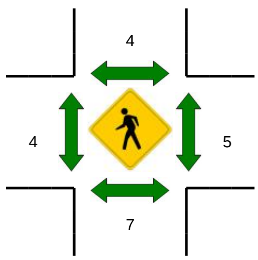
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

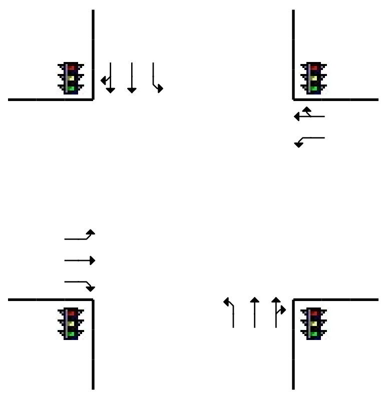
LOCATION: Healdsburg Ave -- Dry Creek Rd/March Ave | **QC JOB #:** 14698203
CITY/STATE: Healdsburg, CA | **DATE:** Tue, May 08 2018

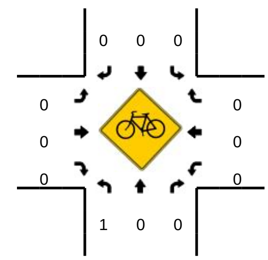


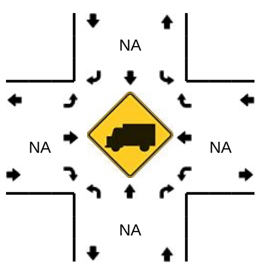
Peak-Hour: 7:35 AM -- 8:35 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

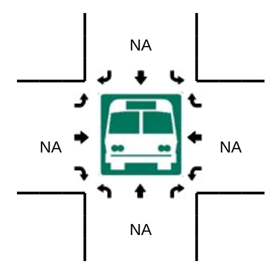












5-Min Count Period Beginning At	Healdsburg Ave (Northbound) Left	Thru	Right	U	Healdsburg Ave (Southbound) Left	Thru	Right	U	Dry Creek Rd/March Ave (Eastbound) Left	Thru	Right	U	Dry Creek Rd/March Ave (Westbound) Left	Thru	Right	U	Total	Hourly Totals
7:00 AM	11	5	2	0	0	6	5	0	6	23	7	0	2	7	1	0	75	
7:05 AM	14	6	3	0	2	16	13	0	6	7	7	0	0	8	1	0	83	
7:10 AM	10	7	2	0	4	8	9	0	10	14	6	0	1	8	2	0	81	
7:15 AM	8	5	4	0	4	11	10	0	6	10	9	0	4	15	3	0	89	
7:20 AM	19	5	3	0	4	8	6	0	9	11	8	0	4	21	3	0	101	
7:25 AM	21	7	3	0	2	12	15	0	7	14	13	0	1	14	2	0	111	
7:30 AM	18	6	1	0	3	8	4	0	6	12	7	0	2	12	2	0	81	
7:35 AM	18	8	3	0	7	10	7	0	10	14	14	0	5	16	4	0	116	
7:40 AM	16	6	2	0	3	24	10	0	7	26	18	0	5	9	3	0	129	
7:45 AM	17	6	3	0	6	18	12	0	7	25	27	0	7	15	4	0	147	
7:50 AM	13	11	5	0	14	42	8	0	6	25	20	0	3	15	4	0	166	
7:55 AM	19	24	4	0	12	34	12	0	13	33	21	0	7	22	10	0	211	1390
8:00 AM	12	14	3	0	2	13	5	0	12	32	12	0	8	22	4	0	139	1454
8:05 AM	23	32	2	0	6	19	12	0	10	15	14	0	2	27	5	0	167	1538
8:10 AM	14	28	3	0	4	8	15	0	11	16	11	0	4	19	1	0	134	1591
8:15 AM	16	16	7	0	3	17	14	0	13	18	11	0	4	18	6	0	143	1645
8:20 AM	22	18	3	0	3	12	16	0	10	16	11	0	3	14	1	0	129	1673
8:25 AM	20	11	5	0	0	14	16	0	13	14	15	0	6	21	5	0	140	1702
8:30 AM	7	14	1	0	0	19	4	0	7	19	16	0	3	16	1	0	107	1728
8:35 AM	13	6	2	0	1	12	6	0	13	13	15	0	2	6	1	0	90	1702
8:40 AM	7	15	7	0	4	13	9	0	6	17	16	0	4	12	1	0	111	1684
8:45 AM	15	10	3	0	3	10	10	0	13	17	11	0	2	20	0	0	114	1651
8:50 AM	18	13	2	0	0	21	10	0	25	10	13	0	4	10	1	0	127	1612
8:55 AM	25	9	1	0	3	13	10	0	12	17	20	0	1	13	6	0	130	1531

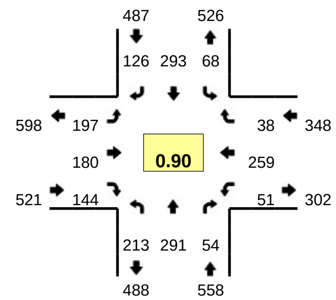
Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	196	164	48	0	128	376	128	0	104	332	272	0	68	208	72	0	2096
Heavy Trucks	16	8	0		0	8	20		12	0	8		4	4	0		80
Pedestrians		12				4				4				4			24
Bicycles	1	0	0		0	0	0		0	0	0		0	0	0		1
Railroad																	
Stopped Buses																	

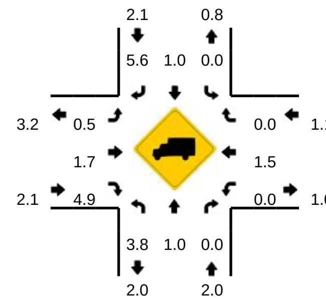
Comments:

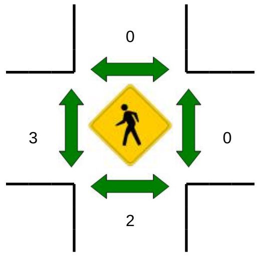
Type of peak hour being reported: Intersection Peak | Method for determining peak hour: Total Entering Volume

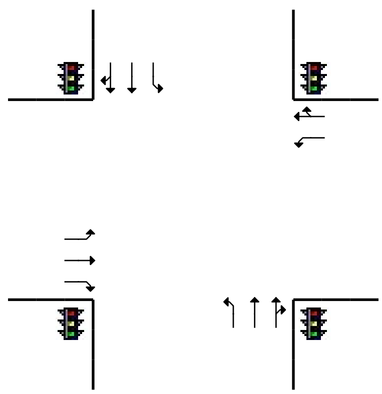
LOCATION: Healdsburg Ave -- Dry Creek Rd/March Ave
CITY/STATE: Healdsburg, CA
QC JOB #: 14698204
DATE: Tue, May 08 2018

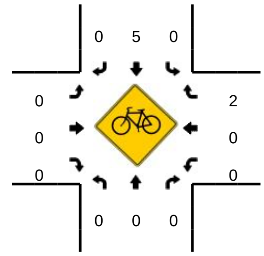
Peak-Hour: 4:45 PM -- 5:45 PM
Peak 15-Min: 4:50 PM -- 5:05 PM

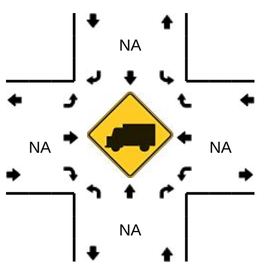


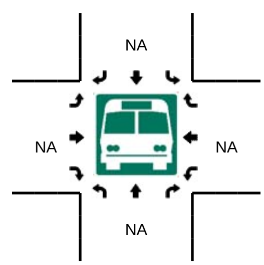












5-Min Count Period Beginning At	Healdsburg Ave (Northbound) Left	Thru	Right	U	Healdsburg Ave (Southbound) Left	Thru	Right	U	Dry Creek Rd/March Ave (Eastbound) Left	Thru	Right	U	Dry Creek Rd/March Ave (Westbound) Left	Thru	Right	U	Total	Hourly Totals
4:00 PM	26	23	5	0	6	20	17	0	8	8	18	0	2	15	3	0	151	
4:05 PM	26	25	2	0	1	10	8	0	10	18	8	0	9	16	4	0	137	
4:10 PM	19	26	0	0	2	36	11	0	10	19	18	0	6	22	2	0	171	
4:15 PM	20	12	5	0	6	23	12	0	10	11	13	0	1	23	1	0	137	
4:20 PM	25	15	1	0	3	17	13	0	14	16	6	0	6	18	4	0	138	
4:25 PM	14	12	4	0	5	19	9	0	15	10	15	0	3	17	4	0	127	
4:30 PM	24	22	2	0	4	16	13	0	9	13	15	0	4	15	0	0	137	
4:35 PM	18	18	6	0	4	18	11	0	14	15	14	0	3	22	3	0	146	
4:40 PM	15	22	7	0	3	23	14	0	17	17	17	0	7	8	1	0	151	
4:45 PM	24	25	4	0	6	18	9	0	12	21	15	0	2	11	2	0	149	
4:50 PM	15	19	5	0	11	46	20	0	18	14	15	0	3	22	0	0	188	
4:55 PM	19	24	4	0	6	24	12	0	22	12	18	0	7	26	2	0	176	1808
5:00 PM	21	21	3	0	4	33	6	0	21	18	6	0	2	27	3	0	165	1822
5:05 PM	21	30	2	0	2	19	13	0	17	10	10	0	7	32	2	0	165	1850
5:10 PM	13	28	3	0	7	17	15	0	11	14	14	0	5	27	2	0	156	1835
5:15 PM	16	17	6	0	9	18	10	0	9	13	5	0	1	29	2	0	135	1833
5:20 PM	19	31	3	0	3	28	12	0	14	14	15	0	3	14	5	0	161	1856
5:25 PM	17	21	12	0	4	21	7	0	24	13	13	0	7	17	6	0	162	1891
5:30 PM	10	19	2	0	8	20	7	0	21	22	9	0	5	23	7	0	153	1907
5:35 PM	23	31	5	0	2	30	7	0	9	12	10	0	0	15	2	0	146	1907
5:40 PM	15	25	5	0	6	19	8	0	19	17	14	0	9	16	5	0	158	1914
5:45 PM	16	27	3	0	9	19	11	0	8	19	7	0	0	14	3	0	136	1901
5:50 PM	12	14	5	0	4	20	7	0	14	14	9	0	5	15	5	0	124	1837
5:55 PM	13	17	2	0	3	23	8	0	20	14	10	0	3	9	0	0	122	1783

Peak 15-Min Flowrates	Northbound Left	Thru	Right	U	Southbound Left	Thru	Right	U	Eastbound Left	Thru	Right	U	Westbound Left	Thru	Right	U	Total
All Vehicles	220	256	48	0	84	412	152	0	244	176	156	0	48	300	20	0	2116
Heavy Trucks	0	4	0		0	4	0		0	8	4		0	0	0		20
Pedestrians		4				0				8				0			12
Bicycles	0	0	0		0	1	0		0	0	0		0	0	2		3
Railroad																	
Stopped Buses																	

Comments:

Type of report: Tube Count - Speed Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing
SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing
CITY/STATE: Healdsburg, CA

QC JOB #: 14698205
DIRECTION: EB
DATE: Jan 25 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	0	1	11	4	2	0	0	0	0	0	0	0	0	18	26-35	15
01:00 AM	0	0	1	2	2	1	0	0	0	0	0	0	0	0	6	26-35	3
02:00 AM	0	0	1	4	7	1	0	0	0	0	0	0	0	0	13	26-35	11
03:00 AM	0	0	2	1	1	2	0	0	0	0	0	0	0	0	6	21-30	3
04:00 AM	0	0	6	4	3	2	1	0	0	0	0	0	0	0	16	21-30	10
05:00 AM	0	1	6	15	17	8	0	1	0	0	0	0	0	0	48	26-35	31
06:00 AM	5	2	14	80	88	26	4	**2**	**1**	0	0	0	0	0	222	26-35	167
07:00 AM	**8**	5	45	193	112	37	8	1	0	0	0	0	0	0	409	26-35	304
08:00 AM	1	8	**72**	**235**	**173**	**49**	**9**	1	0	0	0	0	0	0	**548**	26-35	408
09:00 AM	3	**12**	65	175	146	37	4	1	1	0	0	0	0	0	444	26-35	320
10:00 AM	1	3	46	197	124	34	2	0	0	0	0	0	0	0	407	26-35	321
11:00 AM	7	12	47	171	164	39	2	0	0	0	0	0	0	0	442	26-35	335
12:00 PM	3	5	85	220	163	30	3	0	0	0	0	0	0	0	509	26-35	383
01:00 PM	6	9	67	235	147	33	0	**1**	0	0	0	0	0	0	498	26-35	381
02:00 PM	**15**	12	90	233	137	36	7	0	0	0	0	0	0	0	530	26-35	369
03:00 PM	13	15	63	218	**192**	**38**	**9**	1	0	0	0	0	0	0	549	26-35	409
04:00 PM	7	13	112	258	169	23	4	1	0	0	0	0	0	0	**587**	26-35	427
05:00 PM	13	**38**	**144**	**284**	90	13	2	0	0	0	0	0	0	0	584	21-30	428
06:00 PM	10	12	49	162	96	28	3	0	0	0	0	0	0	0	360	26-35	257
07:00 PM	3	7	36	128	71	21	0	0	0	0	0	0	0	0	266	26-35	198
08:00 PM	2	10	19	62	46	6	2	0	0	0	0	0	0	0	147	26-35	108
09:00 PM	2	5	18	55	50	10	0	0	0	0	0	0	0	0	140	26-35	105
10:00 PM	2	4	8	26	51	6	0	0	0	0	0	0	0	0	97	26-35	77
11:00 PM	2	1	4	21	21	6	1	0	0	0	0	0	0	0	56	26-35	42
Day Total **Percent**	103 1.5%	174 2.5%	1001 14.5%	2990 43.3%	2074 30%	488 7.1%	61 0.9%	9 0.1%	2 0%	0 0%	0 0%	0 0%	0 0%	0 0%	6902	26-35	5064
AM Peak **Volume**	07:00 AM 8	09:00 AM 12	08:00 AM 72	08:00 AM 235	08:00 AM 173	08:00 AM 49	08:00 AM 9	06:00 AM 2	06:00 AM 1	12:00 AM 0	12:00 AM 0	12:00 AM 0	12:00 AM 0	12:00 AM 0	08:00 AM 548		
PM Peak **Volume**	02:00 PM 15	05:00 PM 38	05:00 PM 144	05:00 PM 284	03:00 PM 192	03:00 PM 38	03:00 PM 9	01:00 PM 1	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	04:00 PM 587		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing — **QC JOB #:** 14698205
SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing — **DIRECTION:** EB
CITY/STATE: Healdsburg, CA — **DATE:** Jan 26 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	1	0	2	16	11	3	0	0	0	0	0	0	0	0	33	26-35	26
01:00 AM	1	0	1	7	6	0	0	0	0	0	0	0	0	0	15	26-35	12
02:00 AM	0	0	1	3	6	1	0	0	0	0	0	0	0	0	11	26-35	9
03:00 AM	0	0	0	7	2	0	0	0	0	0	0	0	0	0	9	26-35	9
04:00 AM	1	1	3	5	1	3	0	0	0	0	0	0	0	0	14	21-30	8
05:00 AM	0	2	2	13	14	2	1	0	0	0	0	0	0	0	34	26-35	27
06:00 AM	0	2	12	42	26	12	2	0	0	0	0	0	0	0	96	26-35	68
07:00 AM	0	4	21	50	41	13	**5**	0	0	0	0	0	0	0	134	26-35	91
08:00 AM	1	4	32	112	76	23	2	0	0	0	0	0	0	0	250	26-35	187
09:00 AM	3	7	45	142	**127**	23	1	0	0	0	0	0	0	0	348	26-35	269
10:00 AM	**8**	**9**	**61**	142	124	19	5	0	0	0	0	0	0	0	368	26-35	266
11:00 AM	6	4	41	**198**	117	**33**	3	**1**	0	0	0	0	0	0	**403**	26-35	314
12:00 PM	**15**	16	62	**198**	118	20	3	0	0	0	0	0	0	0	**432**	26-35	316
01:00 PM	8	14	**79**	167	106	18	2	1	0	0	0	0	0	0	395	26-35	272
02:00 PM	6	6	70	184	125	**24**	2	0	0	0	0	0	0	0	417	26-35	309
03:00 PM	4	10	68	188	**132**	24	1	0	0	0	0	0	0	0	427	26-35	319
04:00 PM	7	**17**	64	182	126	20	1	**2**	**1**	0	0	0	0	0	420	26-35	307
05:00 PM	13	5	70	197	106	14	**4**	0	0	0	0	0	0	0	409	26-35	302
06:00 PM	7	8	35	127	95	13	1	0	0	0	0	0	0	0	286	26-35	222
07:00 PM	1	2	25	98	81	18	1	2	0	0	0	0	0	0	228	26-35	178
08:00 PM	8	3	16	70	61	11	3	0	0	0	0	0	0	0	172	26-35	131
09:00 PM	0	2	21	60	57	10	3	0	0	0	0	0	0	0	153	26-35	117
10:00 PM	6	4	13	50	30	7	0	0	0	0	0	0	0	0	110	26-35	80
11:00 PM	1	1	8	25	25	6	1	1	0	0	0	0	0	0	68	26-35	50
Day Total Percent	97 1.9%	121 2.3%	752 14.4%	2283 43.6%	1613 30.8%	317 6.1%	41 0.8%	7 0.1%	1 0%	0 0%	0 0%	0 0%	0 0%	0 0%	5232	26-35	3895

	1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-999	Total		
AM Peak Volume	10:00 AM 8	10:00 AM 9	10:00 AM 61	11:00 AM 198	09:00 AM 127	11:00 AM 33	07:00 AM 5	11:00 AM 1	12:00 AM 0	12:00 AM 0	12:00 AM 0	12:00 AM 0	12:00 AM 0	12:00 AM 0	11:00 AM 403		
PM Peak Volume	12:00 PM 15	04:00 PM 17	01:00 PM 79	12:00 PM 198	03:00 PM 132	02:00 PM 24	05:00 PM 4	04:00 PM 2	04:00 PM 1	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 432		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing
SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing
CITY/STATE: Healdsburg, CA

QC JOB #: 14698205
DIRECTION: EB
DATE: Jan 27 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	1	0	3	18	15	5	0	0	0	0	0	0	0	0	42	26-35	33
01:00 AM	0	4	1	8	19	2	0	0	0	0	0	0	0	0	34	26-35	27
02:00 AM	0	0	4	8	2	1	0	0	0	0	0	0	0	0	15	21-30	11
03:00 AM	0	1	2	7	2	2	1	0	0	0	0	0	0	0	15	22-31	9
04:00 AM	0	0	2	6	5	1	0	0	0	0	0	0	0	0	14	26-35	11
05:00 AM	0	1	3	7	4	4	1	0	0	0	0	0	0	0	20	26-35	11
06:00 AM	0	2	7	21	22	4	1	0	0	0	0	0	0	0	57	26-35	42
07:00 AM	0	0	12	28	34	6	1	0	0	0	0	0	0	0	81	26-35	61
08:00 AM	0	2	15	56	63	18	3	**1**	0	0	0	0	0	0	158	26-35	118
09:00 AM	6	4	28	**155**	**118**	**30**	**5**	1	0	0	0	0	0	0	**347**	26-35	273
10:00 AM	8	**7**	36	122	99	21	2	0	0	0	0	0	0	0	295	26-35	221
11:00 AM	**10**	6	**45**	134	102	20	4	1	0	0	0	0	0	0	322	26-35	236
12:00 PM	6	6	65	131	99	21	**5**	0	0	0	0	0	0	0	333	26-35	230
01:00 PM	5	**10**	49	145	**142**	32	5	0	0	0	0	0	0	0	388	26-35	287
02:00 PM	5	1	37	172	134	13	3	0	0	0	0	0	0	0	365	26-35	306
03:00 PM	6	8	38	183	131	**33**	2	**1**	0	0	0	0	0	0	402	26-35	313
04:00 PM	**10**	2	**71**	**195**	106	18	2	1	0	0	0	0	0	0	**405**	26-35	300
05:00 PM	3	9	61	146	80	16	2	0	**1**	0	0	0	0	0	318	26-35	226
06:00 PM	1	1	24	134	77	17	1	1	0	0	0	0	0	0	256	26-35	211
07:00 PM	5	2	16	85	61	21	0	0	0	0	0	0	0	0	190	26-35	146
08:00 PM	1	5	11	51	40	5	2	0	0	0	0	0	0	0	115	26-35	91
09:00 PM	0	0	18	32	32	4	4	0	0	0	0	0	0	0	90	26-35	63
10:00 PM	2	0	9	30	21	2	0	0	0	0	0	0	0	0	64	26-35	51
11:00 PM	0	0	3	15	14	6	0	0	0	0	0	0	0	0	38	26-35	29
Day Total	69	71	560	1889	1422	302	44	6	1	0	0	0	0	0	4364	26-35	3311
Percent	1.6%	1.6%	12.8%	43.3%	32.6%	6.9%	1%	0.1%	0%	0%	0%	0%	0%	0%			
AM Peak	11:00 AM	10:00 AM	11:00 AM	09:00 AM	09:00 AM	09:00 AM	09:00 AM	08:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	09:00 AM		
Volume	10	7	45	155	118	30	5	1	0	0	0	0	0	0	347		
PM Peak	04:00 PM	01:00 PM	04:00 PM	04:00 PM	01:00 PM	03:00 PM	12:00 PM	03:00 PM	05:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	04:00 PM		
Volume	10	10	71	195	142	33	5	1	1	0	0	0	0	0	405		

Comments:

Type of report: Tube Count - Speed Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing | **QC JOB #:** 14698205

SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing | **DIRECTION:** EB

CITY/STATE: Healdsburg, CA | **DATE:** Jan 28 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	0	3	7	5	1	1	0	0	0	0	0	0	0	17	26-35	12
01:00 AM	0	0	1	3	2	2	0	0	0	0	0	0	0	0	8	26-35	5
02:00 AM	0	1	1	5	3	0	1	0	0	0	0	0	0	0	11	26-35	7
03:00 AM	0	0	1	5	2	0	0	0	0	0	0	0	0	0	8	26-35	7
04:00 AM	0	1	5	6	6	3	0	0	**1**	0	0	0	0	0	22	26-35	11
05:00 AM	1	2	7	24	26	9	2	0	0	0	0	0	0	0	71	26-35	50
06:00 AM	4	0	22	83	72	21	2	0	1	0	0	0	0	0	205	26-35	155
07:00 AM	**13**	**12**	60	205	110	**40**	0	0	0	0	0	0	0	0	440	26-35	315
08:00 AM	12	12	**93**	**219**	**145**	28	3	0	0	0	0	0	0	0	**512**	26-35	364
09:00 AM	3	7	62	163	112	35	**5**	0	0	0	0	0	0	0	387	26-35	275
10:00 AM	4	10	65	182	99	29	1	0	0	0	0	0	0	0	390	26-35	281
11:00 AM	5	7	52	192	130	27	1	0	0	0	0	0	0	0	414	26-35	322
12:00 PM	4	13	81	196	123	23	2	0	0	0	0	0	0	0	442	26-35	319
01:00 PM	7	7	54	230	134	**37**	**3**	0	0	0	0	0	0	0	472	26-35	364
02:00 PM	6	8	58	232	115	24	0	0	0	0	0	0	0	0	443	26-35	347
03:00 PM	**9**	**14**	100	244	125	22	0	0	0	0	0	0	0	0	514	26-35	369
04:00 PM	5	10	**111**	294	138	20	0	0	0	0	0	0	0	0	578	26-35	432
05:00 PM	9	14	91	**310**	**150**	15	1	0	0	0	0	0	0	0	**590**	26-35	460
06:00 PM	2	6	50	168	114	25	0	0	0	0	0	0	0	0	365	26-35	282
07:00 PM	5	3	27	95	55	8	2	0	0	0	0	0	0	0	195	26-35	150
08:00 PM	1	3	16	55	53	14	1	0	0	0	0	0	0	0	143	26-35	107
09:00 PM	2	4	12	47	39	9	1	0	0	0	0	0	0	0	114	26-35	85
10:00 PM	1	1	4	19	12	5	0	0	0	0	0	0	0	0	42	26-35	30
11:00 PM	0	1	4	12	11	2	0	0	0	0	0	0	0	0	30	26-35	22
Day Total **Percent**	93 1.5%	136 2.1%	980 15.3%	2996 46.7%	1781 27.8%	399 6.2%	26 0.4%	0 0%	2 0%	0 0%	0 0%	0 0%	0 0%	0 0%	6413	26-35	4776

AM Peak Volume	07:00 AM 13	07:00 AM 12	08:00 AM 93	08:00 AM 219	08:00 AM 145	07:00 AM 40	09:00 AM 5	12:00 AM 0	04:00 AM 1	12:00 AM 0	12:00 AM 0	12:00 AM 0	12:00 AM 0	12:00 AM 0	08:00 AM 512
PM Peak Volume	03:00 PM 9	03:00 PM 14	04:00 PM 111	05:00 PM 310	05:00 PM 150	01:00 PM 37	01:00 PM 3	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	12:00 PM 0	05:00 PM 590

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing
SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing
CITY/STATE: Healdsburg, CA

QC JOB #: 14698205
DIRECTION: EB
DATE: Jan 29 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	2	0	1	4	3	2	0	0	0	0	0	0	0	0	12	26-35	6
01:00 AM	0	0	0	3	4	1	0	0	0	0	0	0	0	0	8	26-35	6
02:00 AM	0	0	2	2	0	1	0	0	0	0	0	0	0	0	5	21-30	3
03:00 AM	0	0	1	2	0	0	1	0	0	0	0	0	0	0	4	21-30	2
04:00 AM	0	2	2	13	5	2	0	0	0	0	0	0	0	0	24	26-35	18
05:00 AM	0	2	9	24	18	11	3	0	0	0	0	0	0	0	67	26-35	42
06:00 AM	0	1	21	87	95	30	3	0	0	0	0	0	0	0	237	26-35	182
07:00 AM	**8**	13	70	198	118	34	**7**	**2**	0	0	0	0	0	0	450	26-35	316
08:00 AM	6	9	56	**226**	**167**	**36**	4	0	0	0	0	0	0	0	**504**	26-35	392
09:00 AM	7	9	57	182	159	28	5	0	0	0	0	0	0	0	447	26-35	341
10:00 AM	8	8	**76**	194	94	24	0	0	0	0	0	0	0	0	404	26-35	288
11:00 AM	3	**16**	72	209	106	17	0	0	0	0	0	0	0	0	423	26-35	314
12:00 PM	2	7	88	226	129	12	1	0	0	**1**	0	0	0	0	466	26-35	355
01:00 PM	1	5	105	216	139	23	**5**	**1**	0	0	0	0	0	0	495	26-35	355
02:00 PM	4	**14**	81	236	141	28	2	0	0	0	0	0	0	0	506	26-35	376
03:00 PM	6	14	86	**266**	144	28	3	1	0	0	0	0	0	0	548	26-35	410
04:00 PM	**12**	9	82	249	**162**	23	4	0	0	0	0	0	0	0	541	26-35	410
05:00 PM	11	14	**117**	257	158	20	1	1	0	0	0	0	0	0	**579**	26-35	415
06:00 PM	8	10	55	165	103	30	1	0	0	0	0	0	0	0	372	26-35	268
07:00 PM	5	3	29	99	98	**33**	4	0	0	0	0	0	0	0	271	26-35	196
08:00 PM	5	3	13	54	57	6	0	0	0	0	0	0	0	0	138	26-35	111
09:00 PM	1	5	11	38	32	8	0	0	0	0	0	0	0	0	95	26-35	70
10:00 PM	3	1	5	28	20	5	0	0	0	0	0	0	0	0	62	26-35	48
11:00 PM	2	1	8	10	11	2	0	0	0	0	0	0	0	0	34	26-35	20
Day Total	94	146	1047	2988	1963	404	44	5	0	1	0	0	0	0	6692	26-35	4951
Percent	1.4%	2.2%	15.6%	44.7%	29.3%	6%	0.7%	0.1%	0%	0%	0%	0%	0%	0%			
AM Peak	07:00 AM	11:00 AM	10:00 AM	08:00 AM	08:00 AM	08:00 AM	07:00 AM	07:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	08:00 AM		
Volume	8	16	76	226	167	36	7	2	0	0	0	0	0	0	504		
PM Peak	04:00 PM	02:00 PM	05:00 PM	03:00 PM	04:00 PM	07:00 PM	01:00 PM	01:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	05:00 PM		
Volume	12	14	117	266	162	33	5	1	0	1	0	0	0	0	579		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing **QC JOB #:** 14698205
SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing **DIRECTION:** EB
CITY/STATE: Healdsburg, CA **DATE:** Jan 30 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	0	3	8	5	0	0	0	0	0	0	0	0	0	16	26-35	13
01:00 AM	0	0	1	4	4	1	0	0	0	0	0	0	0	0	10	26-35	7
02:00 AM	0	0	1	4	1	0	0	0	0	0	0	0	0	0	6	25-34	5
03:00 AM	0	0	2	1	1	0	0	0	0	0	0	0	0	0	4	21-30	3
04:00 AM	0	0	3	10	5	1	1	0	0	0	0	0	0	0	20	26-35	15
05:00 AM	1	1	7	18	21	16	3	0	0	0	0	0	0	0	67	26-35	39
06:00 AM	1	2	17	79	93	31	**9**	0	0	0	0	0	0	0	232	26-35	171
07:00 AM	**14**	**21**	67	189	133	28	9	0	0	0	0	0	0	0	461	26-35	322
08:00 AM	13	9	**90**	**231**	**152**	26	4	0	0	0	0	0	0	0	**525**	26-35	382
09:00 AM	12	2	71	182	137	25	1	**1**	0	0	0	0	0	0	431	26-35	318
10:00 AM	5	6	52	178	114	**32**	3	0	0	0	0	0	0	0	390	26-35	292
11:00 AM	4	12	59	175	114	24	4	0	**1**	0	0	0	0	0	393	26-35	289
12:00 PM	8	4	63	223	149	27	2	0	0	0	0	0	0	0	476	26-35	372
01:00 PM	1	2	80	239	145	**28**	**5**	0	0	0	0	0	0	0	500	26-35	384
02:00 PM	5	10	83	219	**151**	26	3	0	0	0	0	0	0	0	497	26-35	369
03:00 PM	6	7	56	237	142	28	2	0	0	0	0	0	0	0	478	26-35	378
04:00 PM	6	20	**146**	237	116	27	3	0	0	0	0	0	0	0	555	21-30	382
05:00 PM	**13**	**30**	120	**289**	131	18	2	0	0	0	0	0	0	0	**603**	26-35	419
06:00 PM	6	9	73	182	107	20	5	0	0	0	0	0	0	0	402	26-35	289
07:00 PM	4	8	19	104	80	7	2	0	0	0	0	0	0	0	224	26-35	184
08:00 PM	3	7	13	62	59	18	2	0	0	0	0	0	0	0	164	26-35	120
09:00 PM	0	7	17	56	41	9	1	0	0	0	0	0	0	0	131	26-35	97
10:00 PM	0	2	6	26	25	6	0	0	0	0	0	0	0	0	65	26-35	51
11:00 PM	0	1	5	12	7	3	1	0	0	0	0	0	0	0	29	26-35	18
Day Total **Percent**	102 1.5%	160 2.4%	1054 15.8%	2965 44.4%	1933 28.9%	401 6%	62 0.9%	1 0%	1 0%	0 0%	0 0%	0 0%	0 0%	0 0%	6679	26-35	4898

	1-15	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66-70	71-75	76-999	Total		
AM Peak	07:00 AM	07:00 AM	08:00 AM	08:00 AM	08:00 AM	10:00 AM	06:00 AM	09:00 AM	11:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	08:00 AM		
Volume	14	21	90	231	152	32	9	1	1	0	0	0	0	0	525		
PM Peak	05:00 PM	05:00 PM	04:00 PM	05:00 PM	02:00 PM	01:00 PM	01:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	05:00 PM		
Volume	13	30	146	289	151	28	5	0	0	0	0	0	0	0	603		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

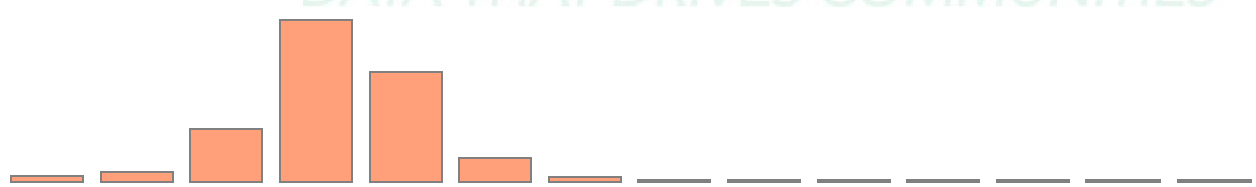
Type of report: Tube Count - Speed Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing — QC JOB #: 14698205

SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing — DIRECTION: EB

CITY/STATE: Healdsburg, CA — DATE: Jan 31 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	2	0	2	3	3	0	0	0	0	0	0	0	0	0	10	26-35	5
01:00 AM	0	0	1	2	4	2	0	0	0	0	0	0	0	0	9	31-40	6
02:00 AM	0	0	3	1	4	1	0	0	0	0	0	0	0	0	9	30-39	5
03:00 AM	0	0	0	4	2	1	0	0	0	0	0	0	0	0	7	26-35	6
04:00 AM	0	2	1	5	9	1	0	0	0	0	0	0	0	0	18	26-35	14
05:00 AM	0	3	9	17	21	6	0	0	0	0	0	0	0	0	56	26-35	38
06:00 AM	1	2	21	91	79	23	2	0	0	0	0	0	0	0	219	26-35	170
07:00 AM	8	15	81	171	**141**	**42**	**7**	**1**	0	0	0	0	0	0	466	26-35	311
08:00 AM	**18**	**17**	**95**	205	141	37	7	0	0	0	0	0	0	0	**520**	26-35	345
09:00 AM	2	11	52	185	138	38	7	0	0	0	0	0	0	0	433	26-35	323
10:00 AM	8	10	71	**206**	123	11	2	1	0	0	0	0	0	0	432	26-35	329
11:00 AM	9	12	77	188	113	25	3	0	0	0	0	0	0	0	427	26-35	301
12:00 PM	2	3	56	203	137	23	4	0	0	0	0	0	0	0	428	26-35	339
01:00 PM	5	7	50	178	146	30	2	0	0	0	0	0	0	0	418	26-35	323
02:00 PM	6	12	62	230	155	21	**8**	1	0	0	0	0	0	0	495	26-35	385
03:00 PM	8	15	59	231	**169**	**33**	3	**2**	0	0	0	0	0	0	520	26-35	400
04:00 PM	**12**	**19**	**138**	294	116	20	2	0	0	0	0	0	0	0	**601**	21-30	432
05:00 PM	12	12	88	**295**	136	24	1	0	0	0	0	0	0	0	568	26-35	430
06:00 PM	2	1	42	167	142	23	4	1	0	0	0	0	0	0	382	26-35	309
07:00 PM	0	2	21	82	84	18	2	0	0	0	0	0	0	0	209	26-35	166
08:00 PM	1	5	14	67	67	13	0	0	0	0	0	0	0	0	167	26-35	134
09:00 PM	1	3	9	45	44	14	3	0	0	0	0	0	0	0	119	26-35	88
10:00 PM	2	1	7	28	20	6	1	0	0	0	0	0	0	0	65	26-35	48
11:00 PM	1	1	0	11	8	0	1	0	0	0	0	0	0	0	22	26-35	19
Day Total	100	153	959	2909	2002	412	59	6	0	0	0	0	0	0	6600	26-35	4910
Percent	1.5%	2.3%	14.5%	44.1%	30.3%	6.2%	0.9%	0.1%	0%	0%	0%	0%	0%	0%			



AM Peak	08:00 AM	08:00 AM	08:00 AM	10:00 AM	07:00 AM	07:00 AM	07:00 AM	07:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	08:00 AM		
Volume	18	17	95	206	141	42	7	1	0	0	0	0	0	0	520		
PM Peak	04:00 PM	04:00 PM	04:00 PM	05:00 PM	03:00 PM	03:00 PM	02:00 PM	03:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	04:00 PM		
Volume	12	19	138	295	169	33	8	2	0	0	0	0	0	0	601		

Comments:

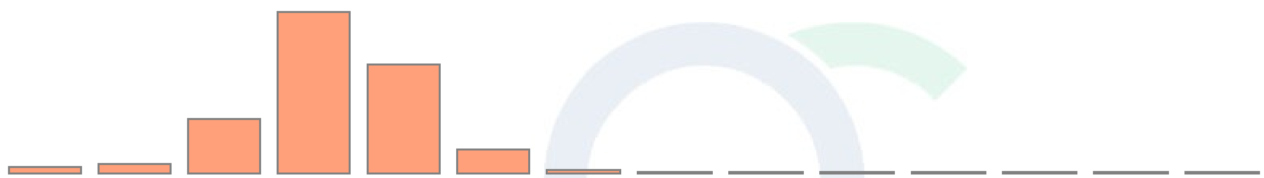
Report generated on 2/6/2019 1:20 PM

Type of report: Tube Count - Speed Data

SUMMARY - Tube Count - Speed Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing
SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing
CITY/STATE: Healdsburg, CA

QC JOB #: 14698205
DIRECTION: EB
DATE: Jan 25 2019 - Jan 31 2019

Speed Range	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
Grand Total Percent	658 1.5%	961 2.2%	6353 14.8%	19020 44.4%	12788 29.8%	2723 6.3%	337 0.8%	34 0.1%	7 0%	1 0%	0 0%	0 0%	0 0%	0 0%	42882	26-35	31807
Cumulative Percent	1.5%	3.8%	18.6%	62.9%	92.8%	99.1%	99.9%	100%	100%	100%	100%	100%	100%	100%			
ADT 6126															**85th Percentile:** 33 MPH **Mean Speed(Average):** 28 MPH **Median:** 28 MPH **Mode:** 28 MPH		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

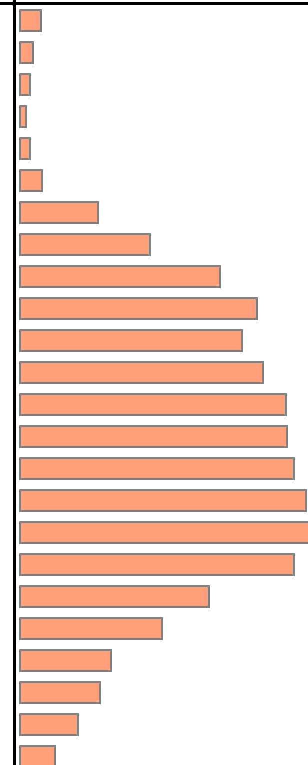
Type of report: Tube Count - Volume Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing — **QC JOB #:** 14698205

SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing — **DIRECTION:** EB

CITY/STATE: Healdsburg, CA — **DATE:** Jan 25 2019 - Jan 31 2019

Start Time	Mon	Tue	Wed	Thu	Fri 25 Jan 19	Average Weekday Hourly Traffic	Sat 26 Jan 19	Sun 27 Jan 19	Average Week Hourly Traffic	Average Week Profile
12:00 AM					18	18	33	42	31	
01:00 AM					6	6	15	34	18	
02:00 AM					13	13	11	15	13	
03:00 AM					6	6	9	15	10	
04:00 AM					16	16	14	14	15	
05:00 AM					48	48	34	20	34	
06:00 AM					222	222	96	57	125	
07:00 AM					409	409	134	81	208	
08:00 AM					**548**	**548**	250	158	319	
09:00 AM					444	444	348	**347**	380	
10:00 AM					407	407	368	295	357	
11:00 AM					442	442	**403**	322	**389**	
12:00 PM					509	509	**432**	333	425	
01:00 PM					498	498	395	388	427	
02:00 PM					530	530	417	365	437	
03:00 PM					549	549	427	402	459	
04:00 PM					**587**	**587**	420	**405**	**471**	
05:00 PM					584	584	409	318	437	
06:00 PM					360	360	286	256	301	
07:00 PM					266	266	228	190	228	
08:00 PM					147	147	172	115	145	
09:00 PM					140	140	153	90	128	
10:00 PM					97	97	110	64	90	
11:00 PM					56	56	68	38	54	
Day Total					6902	6902	5232	4364	5501	
% Weekday Average					100%					
% Week Average					125.5%	125.5%	95.1%	79.3%		
AM Peak Volume					08:00 AM 548	08:00 AM 548	11:00 AM 403	09:00 AM 347	11:00 AM 389	
PM Peak Volume					04:00 PM 587	04:00 PM 587	12:00 PM 432	04:00 PM 405	04:00 PM 471	



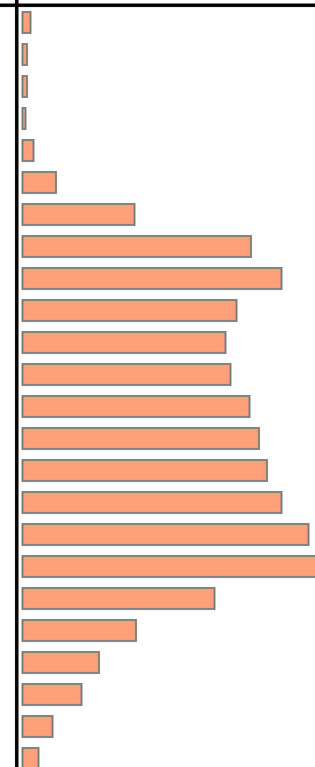
Comments:

Report generated on 2/6/2019 1:20 PM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Volume Data

LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing — **QC JOB #:** 14698205
SPECIFIC LOCATION: EB Dry Creek Rd btwn Grove St & railroad crossing — **DIRECTION:** EB
CITY/STATE: Healdsburg, CA — **DATE:** Jan 25 2019 - Jan 31 2019

Start Time	Mon 28 Jan 19	Tue 29 Jan 19	Wed 30 Jan 19	Thu 31 Jan 19	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM	17	12	16	10		14			14	
01:00 AM	8	8	10	9		9			9	
02:00 AM	11	5	6	9		8			8	
03:00 AM	8	4	4	7		6			6	
04:00 AM	22	24	20	18		21			21	
05:00 AM	71	67	67	56		65			65	
06:00 AM	205	237	232	219		223			223	
07:00 AM	440	450	461	466		454			454	
08:00 AM	**512**	**504**	**525**	**520**		**515**			**515**	
09:00 AM	387	447	431	433		425			425	
10:00 AM	390	404	390	432		404			404	
11:00 AM	414	423	393	427		414			414	
12:00 PM	442	466	476	428		453			453	
01:00 PM	472	495	500	418		471			471	
02:00 PM	443	506	497	495		485			485	
03:00 PM	514	548	478	520		515			515	
04:00 PM	578	541	555	**601**		569			569	
05:00 PM	**590**	**579**	**603**	568		**585**			**585**	
06:00 PM	365	372	402	382		380			380	
07:00 PM	195	271	224	209		225			225	
08:00 PM	143	138	164	167		153			153	
09:00 PM	114	95	131	119		115			115	
10:00 PM	42	62	65	65		59			59	
11:00 PM	30	34	29	22		29			29	
Day Total	6413	6692	6679	6600		6597			6597	
% Weekday Average	97.2%	101.4%	101.2%	100%						
% Week Average	97.2%	101.4%	101.2%	100%		100%				
AM Peak Volume	08:00 AM 512	08:00 AM 504	08:00 AM 525	08:00 AM 520		08:00 AM 515			08:00 AM 515	
PM Peak Volume	05:00 PM 590	05:00 PM 579	05:00 PM 603	04:00 PM 601		05:00 PM 585			05:00 PM 585	



Comments:

Report generated on 2/6/2019 1:20 PM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave **QC JOB #:** 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave **DIRECTION:** WB
CITY/STATE: Healdsburg, CA **DATE:** Jan 25 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	1	0	2	12	3	2	0	0	0	0	0	0	0	0	20	26-35	14
01:00 AM	0	0	1	5	6	1	0	0	0	0	0	0	0	0	13	26-35	10
02:00 AM	1	0	4	2	3	0	0	0	0	0	0	0	0	0	10	21-30	6
03:00 AM	0	0	0	7	8	4	0	0	0	0	0	0	0	0	19	26-35	14
04:00 AM	1	1	0	15	15	7	0	0	0	0	0	0	0	0	39	26-35	30
05:00 AM	0	4	2	30	47	**16**	1	0	0	0	0	0	0	0	100	26-35	77
06:00 AM	1	5	33	115	107	15	1	0	0	0	0	0	0	0	277	26-35	222
07:00 AM	15	32	94	**254**	72	9	**2**	0	0	0	0	0	0	0	478	21-30	348
08:00 AM	4	39	95	226	**119**	15	1	0	0	0	0	0	0	0	**499**	26-35	345
09:00 AM	6	40	87	193	97	7	1	0	0	0	0	0	0	0	431	26-35	290
10:00 AM	**17**	40	**99**	186	101	8	2	0	0	0	0	0	0	0	453	26-35	286
11:00 AM	9	**59**	97	222	85	15	0	0	0	0	0	0	0	0	487	21-30	319
12:00 PM	17	78	125	213	83	6	**1**	0	0	0	0	0	0	0	523	21-30	338
01:00 PM	13	56	135	211	**88**	4	0	0	0	0	0	0	0	0	507	21-30	345
02:00 PM	22	58	144	257	72	**8**	1	0	0	0	0	0	0	0	562	21-30	400
03:00 PM	**34**	77	119	**268**	79	3	0	0	0	0	0	0	0	0	580	21-30	387
04:00 PM	29	84	156	231	72	2	1	0	0	0	0	0	0	0	575	21-30	386
05:00 PM	32	**105**	**192**	236	39	3	0	0	0	0	0	0	0	0	**607**	21-30	427
06:00 PM	11	31	79	167	77	4	1	0	0	0	0	0	0	0	370	21-30	246
07:00 PM	3	23	36	131	84	8	0	**1**	0	0	0	0	0	0	286	26-35	215
08:00 PM	4	21	16	64	44	5	0	0	0	0	0	0	0	0	154	26-35	107
09:00 PM	2	2	23	54	49	5	0	0	0	0	0	0	0	0	135	26-35	102
10:00 PM	0	6	8	43	38	7	0	0	0	0	0	0	0	0	102	26-35	80
11:00 PM	1	1	6	21	23	6	0	0	0	0	0	0	0	0	58	26-35	44
Day Total	223	762	1553	3163	1411	160	12	1	0	0	0	0	0	0	7285	21-30	4716
Percent	3.1%	10.5%	21.3%	43.4%	19.4%	2.2%	0.2%	0%	0%	0%	0%	0%	0%	0%			
AM Peak	10:00 AM	11:00 AM	10:00 AM	07:00 AM	08:00 AM	05:00 AM	07:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	08:00 AM		
Volume	17	59	99	254	119	16	2	0	0	0	0	0	0	0	499		
PM Peak	03:00 PM	05:00 PM	05:00 PM	03:00 PM	01:00 PM	02:00 PM	12:00 PM	07:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	05:00 PM		
Volume	34	105	192	268	88	8	1	1	0	0	0	0	0	0	607		

Comments:

Report generated on 2/6/2019 1:20 PM SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **QC JOB #:** 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **DIRECTION:** WB
CITY/STATE: Healdsburg, CA — **DATE:** Jan 26 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	0	2	17	7	2	**1**	0	0	0	0	0	0	0	29	26-35	23
01:00 AM	0	1	1	13	8	0	0	0	0	0	0	0	0	0	23	26-35	21
02:00 AM	0	0	2	6	4	0	0	0	0	0	0	0	0	0	12	26-35	10
03:00 AM	0	0	1	4	6	1	0	0	0	0	0	0	0	0	12	26-35	10
04:00 AM	0	1	1	5	13	3	0	0	0	0	0	0	0	0	23	26-35	18
05:00 AM	1	2	4	29	18	5	0	0	0	0	0	0	0	0	59	26-35	47
06:00 AM	0	3	11	65	48	9	0	0	0	0	0	0	0	0	136	26-35	112
07:00 AM	4	16	28	85	47	5	0	0	0	0	0	0	0	0	185	26-35	132
08:00 AM	5	21	43	119	74	**10**	1	0	0	0	0	0	0	0	273	26-35	193
09:00 AM	4	44	44	174	**91**	10	1	0	0	0	0	0	0	0	368	26-35	264
10:00 AM	**6**	37	68	**190**	83	10	0	0	0	0	0	0	0	0	394	26-35	273
11:00 AM	6	**60**	**73**	178	80	8	1	0	0	0	0	0	0	0	**406**	26-35	258
12:00 PM	**52**	**71**	**165**	188	43	2	0	0	0	0	0	0	0	0	**521**	21-30	353
01:00 PM	6	61	106	**225**	**73**	4	0	0	0	0	0	0	0	0	475	21-30	331
02:00 PM	15	43	97	196	72	6	0	0	0	0	0	0	0	0	429	21-30	292
03:00 PM	11	47	97	189	63	4	0	0	0	0	0	0	0	0	411	21-30	286
04:00 PM	10	57	73	184	65	5	0	0	0	0	0	0	0	0	394	21-30	257
05:00 PM	10	61	91	152	52	4	0	0	0	0	0	0	0	0	370	21-30	243
06:00 PM	4	42	39	113	69	**12**	**2**	0	0	0	0	0	0	0	281	26-35	182
07:00 PM	2	26	35	84	67	4	1	0	0	0	0	0	0	0	219	26-35	151
08:00 PM	4	10	28	74	55	6	0	**1**	0	0	0	0	0	0	178	26-35	129
09:00 PM	0	5	16	52	44	4	1	0	0	0	0	0	0	0	122	26-35	95
10:00 PM	2	2	10	40	46	1	0	0	0	0	0	0	0	0	101	26-35	86
11:00 PM	0	0	3	36	27	4	1	0	0	0	0	0	0	0	71	26-35	62
Day Total	142	610	1038	2418	1155	119	9	1	0	0	0	0	0	0	5492	26-35	3573
Percent	2.6%	11.1%	18.9%	44%	21%	2.2%	0.2%	0%	0%	0%	0%	0%	0%	0%			
AM Peak	10:00 AM	11:00 AM	11:00 AM	10:00 AM	09:00 AM	08:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	11:00 AM		
Volume	6	60	73	190	91	10	1	0	0	0	0	0	0	0	406		
PM Peak	12:00 PM	12:00 PM	12:00 PM	01:00 PM	01:00 PM	06:00 PM	06:00 PM	08:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM		
Volume	52	71	165	225	73	12	2	1	0	0	0	0	0	0	521		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave | **QC JOB #:** 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave | **DIRECTION:** WB
CITY/STATE: Healdsburg, CA | **DATE:** Jan 27 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	1	2	21	23	3	0	0	0	0	0	0	0	0	50	26-35	44
01:00 AM	0	0	1	12	16	3	0	0	0	0	0	0	0	0	32	26-35	27
02:00 AM	0	1	4	9	12	2	0	0	0	0	0	0	0	0	28	26-35	20
03:00 AM	0	0	5	3	5	1	0	0	0	0	0	0	0	0	14	24-33	8
04:00 AM	1	1	0	5	8	3	0	0	0	0	0	0	0	0	18	26-35	12
05:00 AM	0	0	3	8	10	3	**2**	0	0	0	0	0	0	0	26	26-35	18
06:00 AM	0	2	7	23	22	2	0	0	0	0	0	0	0	0	56	26-35	44
07:00 AM	1	6	16	57	42	7	1	0	0	0	0	0	0	0	130	26-35	99
08:00 AM	1	16	29	72	71	7	0	0	0	0	0	0	0	0	196	26-35	143
09:00 AM	6	37	**50**	127	90	**15**	0	0	0	0	0	0	0	0	325	26-35	217
10:00 AM	**14**	39	45	149	82	10	0	0	0	0	0	0	0	0	339	26-35	231
11:00 AM	9	**42**	50	**213**	**113**	4	0	0	0	0	0	0	0	0	**431**	26-35	326
12:00 PM	7	51	73	**200**	89	**9**	0	0	0	0	0	0	0	0	429	26-35	289
01:00 PM	10	51	**83**	184	**99**	6	0	0	0	0	0	0	0	0	**433**	26-35	283
02:00 PM	**18**	51	53	156	80	8	**2**	0	0	0	0	0	0	0	368	26-35	236
03:00 PM	8	36	67	159	71	5	0	0	0	0	0	0	0	0	346	26-35	229
04:00 PM	6	**58**	69	174	56	3	0	0	0	0	0	0	0	0	366	21-30	243
05:00 PM	11	53	74	115	49	7	0	0	0	0	0	0	0	0	309	21-30	189
06:00 PM	5	36	39	86	52	6	0	0	0	0	0	0	0	0	224	26-35	138
07:00 PM	3	23	20	75	55	7	2	0	0	0	0	0	0	0	185	26-35	130
08:00 PM	5	9	17	51	34	7	0	0	0	0	0	0	0	0	123	26-35	84
09:00 PM	2	4	8	34	26	5	0	0	0	0	0	0	0	0	79	26-35	60
10:00 PM	0	1	5	25	17	2	0	0	0	0	0	0	0	0	50	26-35	41
11:00 PM	1	2	2	7	6	4	0	0	0	0	0	0	0	0	22	26-35	12
Day Total	108	520	722	1965	1128	129	7	0	0	0	0	0	0	0	4579	26-35	3092
Percent	2.4%	11.4%	15.8%	42.9%	24.6%	2.8%	0.2%	0%	0%	0%	0%	0%	0%	0%			
AM Peak	10:00 AM	11:00 AM	09:00 AM	11:00 AM	11:00 AM	09:00 AM	05:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	11:00 AM		
Volume	14	42	50	213	113	15	2	0	0	0	0	0	0	0	431		
PM Peak	02:00 PM	04:00 PM	01:00 PM	12:00 PM	01:00 PM	12:00 PM	02:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	01:00 PM		
Volume	18	58	83	200	99	9	2	0	0	0	0	0	0	0	433		

Comments:

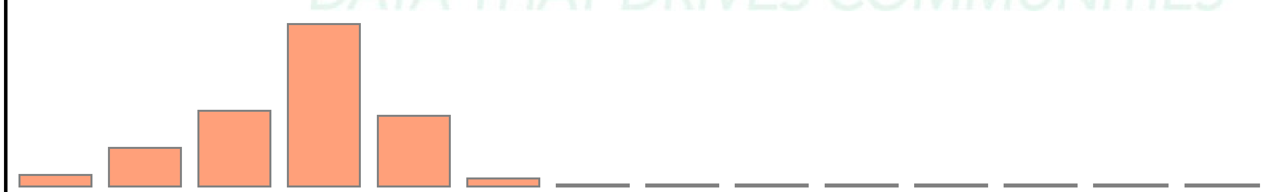
Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave
QC JOB #: 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave
DIRECTION: WB
CITY/STATE: Healdsburg, CA
DATE: Jan 28 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	4	2	5	7	2	0	0	0	0	0	0	0	0	20	26-35	12
01:00 AM	0	0	5	4	3	0	0	0	0	0	0	0	0	0	12	21-30	9
02:00 AM	0	0	2	4	7	2	0	0	0	0	0	0	0	0	15	26-35	11
03:00 AM	0	0	0	6	7	4	0	0	0	0	0	0	0	0	17	26-35	13
04:00 AM	1	0	4	11	12	2	1	0	0	0	0	0	0	0	31	26-35	22
05:00 AM	2	3	13	33	54	12	1	0	0	0	0	0	0	0	118	26-35	86
06:00 AM	1	5	35	163	98	**14**	0	0	0	0	0	0	0	0	316	26-35	261
07:00 AM	8	20	**98**	224	100	7	0	0	0	0	0	0	0	0	457	26-35	324
08:00 AM	10	33	93	**258**	**117**	3	**2**	0	0	0	0	0	0	0	**516**	26-35	374
09:00 AM	11	39	97	178	84	5	0	0	0	0	0	0	0	0	414	21-30	275
10:00 AM	**17**	33	86	210	71	2	1	0	0	0	0	0	0	0	420	21-30	296
11:00 AM	11	**57**	80	216	97	6	0	0	0	0	0	0	0	0	467	26-35	312
12:00 PM	11	**82**	85	209	56	10	0	0	0	0	0	0	0	0	453	21-30	294
01:00 PM	6	71	96	219	**91**	7	0	0	0	0	0	0	0	0	490	21-30	315
02:00 PM	8	55	94	228	77	11	**1**	0	0	0	0	0	0	0	474	21-30	322
03:00 PM	30	72	148	232	65	7	0	0	0	0	0	0	0	0	**554**	21-30	379
04:00 PM	21	60	167	**248**	44	4	1	0	0	0	0	0	0	0	545	21-30	415
05:00 PM	**37**	82	**169**	199	47	1	0	0	0	0	0	0	0	0	535	21-30	368
06:00 PM	5	38	54	142	70	7	0	0	0	0	0	0	0	0	316	26-35	212
07:00 PM	6	35	39	104	75	**18**	1	0	0	0	0	0	0	0	278	26-35	179
08:00 PM	2	8	34	53	44	5	1	0	0	0	0	0	0	0	147	26-35	96
09:00 PM	6	3	3	37	41	5	1	0	0	0	0	0	0	0	96	26-35	78
10:00 PM	0	0	1	10	15	3	0	0	0	0	0	0	0	0	29	26-35	25
11:00 PM	0	2	2	14	12	4	1	0	0	0	0	0	0	0	35	26-35	25
Day Total	193	702	1407	3007	1294	141	11	0	0	0	0	0	0	0	6755	21-30	4414
Percent	2.9%	10.4%	20.8%	44.5%	19.2%	2.1%	0.2%	0%	0%	0%	0%	0%	0%	0%			
AM Peak	10:00 AM	11:00 AM	07:00 AM	08:00 AM	08:00 AM	06:00 AM	08:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	08:00 AM		
Volume	17	57	98	258	117	14	2	0	0	0	0	0	0	0	516		
PM Peak	05:00 PM	12:00 PM	05:00 PM	04:00 PM	01:00 PM	07:00 PM	02:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	03:00 PM		
Volume	37	82	169	248	91	18	1	0	0	0	0	0	0	0	554		



Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave **QC JOB #:** 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave **DIRECTION:** WB
CITY/STATE: Healdsburg, CA **DATE:** Jan 29 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	0	1	1	7	5	0	0	0	0	0	0	0	0	0	14	26-35	12
01:00 AM	0	0	2	10	6	2	0	0	0	0	0	0	0	0	20	26-35	15
02:00 AM	1	0	1	3	0	0	**1**	**1**	0	0	0	0	0	0	7	21-30	4
03:00 AM	6	1	2	9	4	4	1	0	0	0	0	0	0	0	27	26-35	13
04:00 AM	0	1	2	18	14	1	1	0	0	0	0	0	0	0	37	26-35	32
05:00 AM	1	2	8	47	45	**12**	1	0	0	0	0	0	0	0	116	26-35	92
06:00 AM	1	6	25	175	90	9	0	0	0	0	0	0	0	0	306	26-35	265
07:00 AM	8	35	72	277	93	7	0	0	0	0	0	0	0	0	492	26-35	370
08:00 AM	10	30	91	**289**	**110**	9	0	0	0	0	0	0	0	0	**539**	26-35	399
09:00 AM	5	34	86	185	89	5	0	0	0	0	0	0	0	0	404	26-35	274
10:00 AM	8	38	71	212	78	3	1	0	0	0	0	0	0	0	411	26-35	290
11:00 AM	**15**	**60**	**101**	229	73	3	0	0	0	0	0	0	0	0	481	21-30	330
12:00 PM	18	71	110	207	66	2	0	0	0	0	0	0	0	0	474	21-30	317
01:00 PM	14	**84**	107	218	74	**10**	0	0	0	0	0	0	0	0	507	21-30	325
02:00 PM	19	44	99	242	**109**	6	0	0	0	0	0	0	0	0	519	26-35	351
03:00 PM	10	84	**202**	254	64	3	0	0	0	0	0	0	0	0	**617**	21-30	456
04:00 PM	18	80	149	**255**	74	8	**1**	0	0	0	0	0	0	0	585	21-30	404
05:00 PM	**37**	82	136	248	62	7	0	0	0	0	0	0	0	0	572	21-30	384
06:00 PM	4	45	52	148	80	8	0	0	0	0	0	0	0	0	337	26-35	228
07:00 PM	4	27	30	90	108	10	0	0	0	0	0	0	0	0	269	26-35	197
08:00 PM	3	10	25	89	44	9	1	0	0	0	0	0	0	0	181	26-35	133
09:00 PM	4	3	7	44	25	8	0	0	0	0	0	0	0	0	91	26-35	69
10:00 PM	0	1	9	15	9	8	0	0	0	0	0	0	0	0	42	24-33	24
11:00 PM	0	0	3	17	17	4	0	0	0	0	0	0	0	0	41	26-35	33
Day Total	186	739	1391	3288	1339	138	7	1	0	0	0	0	0	0	7089	21-30	4679
Percent	2.6%	10.4%	19.6%	46.4%	18.9%	1.9%	0.1%	0%	0%	0%	0%	0%	0%	0%			
AM Peak	11:00 AM	11:00 AM	11:00 AM	08:00 AM	08:00 AM	05:00 AM	02:00 AM	02:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	08:00 AM		
Volume	15	60	101	289	110	12	1	1	0	0	0	0	0	0	539		
PM Peak	05:00 PM	01:00 PM	03:00 PM	04:00 PM	02:00 PM	01:00 PM	04:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	03:00 PM		
Volume	37	84	202	255	109	10	1	0	0	0	0	0	0	0	617		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **QC JOB #:** 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **DIRECTION:** WB
CITY/STATE: Healdsburg, CA — **DATE:** Jan 30 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	1	1	2	7	5	0	0	0	0	0	0	0	0	0	16	26-35	12
01:00 AM	0	0	2	5	4	0	**1**	0	0	0	0	0	0	0	12	26-35	9
02:00 AM	0	0	1	8	4	0	0	0	0	0	0	0	0	0	13	26-35	12
03:00 AM	0	0	5	4	4	2	0	0	0	0	0	0	0	0	15	21-30	9
04:00 AM	0	0	4	9	11	3	0	0	0	0	0	0	0	0	27	26-35	19
05:00 AM	1	3	5	41	56	7	0	0	0	0	0	0	0	0	113	26-35	97
06:00 AM	5	6	28	141	**116**	**12**	0	**1**	0	0	0	0	0	0	309	26-35	256
07:00 AM	8	33	83	217	104	11	1	0	0	0	0	0	0	0	457	26-35	321
08:00 AM	13	46	**119**	**271**	78	5	0	0	0	0	0	0	0	0	**532**	21-30	389
09:00 AM	10	39	72	232	97	5	1	0	0	0	0	0	0	0	456	26-35	328
10:00 AM	6	29	75	211	95	6	0	0	0	0	0	0	0	0	422	26-35	306
11:00 AM	**16**	**55**	88	215	86	6	0	0	0	0	0	0	0	0	466	21-30	303
12:00 PM	9	**75**	114	225	93	9	0	0	0	0	0	0	0	0	525	21-30	339
01:00 PM	8	59	79	206	**113**	7	0	0	0	0	0	0	0	0	472	26-35	319
02:00 PM	13	58	135	260	82	5	0	0	0	0	0	0	0	0	553	21-30	395
03:00 PM	23	63	140	254	81	6	**1**	0	0	0	0	0	0	0	568	21-30	394
04:00 PM	**60**	64	155	224	58	4	0	0	0	0	0	0	0	0	565	21-30	379
05:00 PM	13	55	**157**	**275**	75	3	0	0	0	0	0	0	0	0	**578**	21-30	432
06:00 PM	7	36	50	150	89	6	0	0	0	0	0	0	0	0	338	26-35	239
07:00 PM	0	27	31	121	86	**15**	1	0	0	0	0	0	0	0	281	26-35	206
08:00 PM	4	10	23	90	53	7	1	0	0	0	0	0	0	0	188	26-35	142
09:00 PM	5	2	13	56	50	8	0	0	0	0	0	0	0	0	134	26-35	106
10:00 PM	0	1	9	19	19	6	1	0	0	0	0	0	0	0	55	26-35	38
11:00 PM	0	0	7	5	10	2	1	0	0	0	0	0	0	0	25	26-35	15
Day Total	202	662	1397	3246	1469	135	8	1	0	0	0	0	0	0	7120	26-35	4715
Percent	2.8%	9.3%	19.6%	45.6%	20.6%	1.9%	0.1%	0%	0%	0%	0%	0%	0%	0%			
AM Peak	11:00 AM	11:00 AM	08:00 AM	08:00 AM	06:00 AM	06:00 AM	01:00 AM	06:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	08:00 AM		
Volume	16	55	119	271	116	12	1	1	0	0	0	0	0	0	532		
PM Peak	04:00 PM	12:00 PM	05:00 PM	05:00 PM	01:00 PM	07:00 PM	03:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	05:00 PM		
Volume	60	75	157	275	113	15	1	0	0	0	0	0	0	0	578		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Speed Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **QC JOB #:** 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **DIRECTION:** WB
CITY/STATE: Healdsburg, CA — **DATE:** Jan 31 2019

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
12:00 AM	3	1	0	2	2	0	0	0	0	0	0	0	0	0	8	26-35	3
01:00 AM	0	0	1	6	4	0	0	0	0	0	0	0	0	0	11	26-35	10
02:00 AM	0	0	5	8	4	1	0	0	0	0	0	0	0	0	18	21-30	12
03:00 AM	0	0	1	5	3	4	**1**	0	0	0	0	0	0	0	14	26-35	7
04:00 AM	0	0	3	10	10	8	0	0	0	0	0	0	0	0	31	26-35	20
05:00 AM	0	2	4	36	41	11	0	0	0	0	0	0	0	0	94	26-35	77
06:00 AM	0	0	34	153	**109**	11	1	0	0	0	0	0	0	0	308	26-35	262
07:00 AM	11	27	95	225	106	12	0	0	0	0	0	0	0	0	476	26-35	330
08:00 AM	**14**	36	90	**268**	91	11	0	0	0	0	0	0	0	0	**510**	26-35	358
09:00 AM	9	33	70	201	101	8	0	0	0	0	0	0	0	0	422	26-35	301
10:00 AM	11	40	61	198	105	**13**	1	0	0	0	0	0	0	0	429	26-35	303
11:00 AM	13	**57**	**114**	192	85	11	0	0	0	0	0	0	0	0	472	21-30	306
12:00 PM	17	79	81	204	**109**	11	**2**	0	0	0	0	0	0	0	503	26-35	313
01:00 PM	8	51	66	200	101	**12**	0	0	0	0	0	0	0	0	438	26-35	300
02:00 PM	12	44	109	236	91	8	0	0	0	0	0	0	0	0	500	21-30	344
03:00 PM	25	62	138	**282**	84	6	0	0	0	0	0	0	0	0	597	21-30	419
04:00 PM	**31**	**97**	**164**	282	75	8	0	0	0	0	0	0	0	0	**657**	21-30	445
05:00 PM	16	69	129	247	75	4	1	0	0	0	0	0	0	0	541	21-30	375
06:00 PM	7	41	49	156	76	5	0	0	0	0	0	0	0	0	334	26-35	231
07:00 PM	2	29	36	108	89	8	0	0	0	0	0	0	0	0	272	26-35	197
08:00 PM	6	13	29	73	48	7	0	0	0	0	0	0	0	0	176	26-35	120
09:00 PM	2	2	12	61	43	4	1	0	0	0	0	0	0	0	125	26-35	103
10:00 PM	0	1	7	18	20	5	1	0	**1**	0	0	0	0	0	53	26-35	38
11:00 PM	2	1	1	26	14	3	1	0	1	0	0	0	0	0	49	26-35	39
Day Total	189	685	1299	3197	1486	171	9	0	2	0	0	0	0	0	7038	26-35	4682
Percent	2.7%	9.7%	18.5%	45.4%	21.1%	2.4%	0.1%	0%	0%	0%	0%	0%	0%	0%			
AM Peak	08:00 AM	11:00 AM	11:00 AM	08:00 AM	06:00 AM	10:00 AM	03:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	12:00 AM	08:00 AM		
Volume	14	57	114	268	109	13	1	0	0	0	0	0	0	0	510		
PM Peak	04:00 PM	04:00 PM	04:00 PM	03:00 PM	12:00 PM	01:00 PM	12:00 PM	12:00 PM	10:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	12:00 PM	04:00 PM		
Volume	31	97	164	282	109	12	2	0	1	0	0	0	0	0	657		

Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

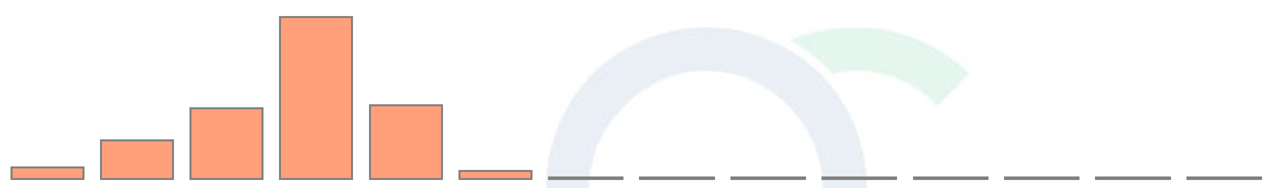
Type of report: Tube Count - Speed Data

SUMMARY - Tube Count - Speed Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **QC JOB #:** 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **DIRECTION:** WB
CITY/STATE: Healdsburg, CA — **DATE:** Jan 25 2019 - Jan 31 2019

Speed Range	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	76 999	Total	Pace Speed	Number in Pace
Grand Total Percent	1243 2.7%	4680 10.3%	8807 19.4%	20284 44.7%	9282 20.5%	993 2.2%	63 0.1%	4 0%	2 0%	0 0%	0 0%	0 0%	0 0%	0 0%	45358	26-35	29566
Cumulative Percent	2.7%	13.1%	32.5%	77.2%	97.7%	99.8%	100%	100%	100%	100%	100%	100%	100%	100%			

ADT
6479



85th Percentile: 31 MPH
Mean Speed(Average): 26 MPH
Median: 26 MPH
Mode: 28 MPH

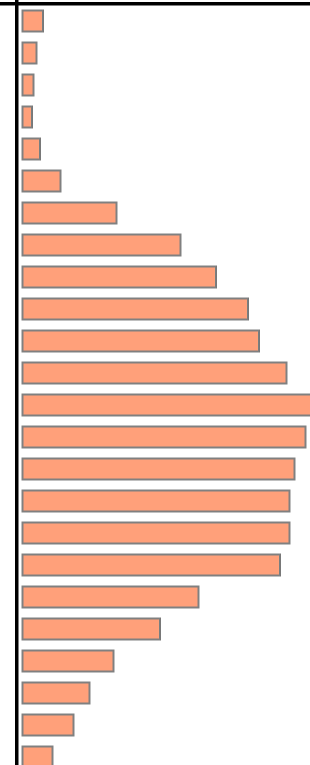
Comments:

Report generated on 2/6/2019 1:20 PM — SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of report: Tube Count - Volume Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **QC JOB #:** 14698206
SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **DIRECTION:** WB
CITY/STATE: Healdsburg, CA — **DATE:** Jan 25 2019 - Jan 31 2019

Start Time	Mon	Tue	Wed	Thu	Fri 25 Jan 19	Average Weekday Hourly Traffic	Sat 26 Jan 19	Sun 27 Jan 19	Average Week Hourly Traffic	Average Week Profile
12:00 AM					20	20	29	50	33	
01:00 AM					13	13	23	32	23	
02:00 AM					10	10	12	28	17	
03:00 AM					19	19	12	14	15	
04:00 AM					39	39	23	18	27	
05:00 AM					100	100	59	26	62	
06:00 AM					277	277	136	56	156	
07:00 AM					478	478	185	130	264	
08:00 AM					**499**	**499**	273	196	323	
09:00 AM					431	431	368	325	375	
10:00 AM					453	453	394	339	395	
11:00 AM					487	487	**406**	**431**	**441**	
12:00 PM					523	523	**521**	429	**491**	
01:00 PM					507	507	475	**433**	472	
02:00 PM					562	562	429	368	453	
03:00 PM					580	580	411	346	446	
04:00 PM					575	575	394	366	445	
05:00 PM					**607**	**607**	370	309	429	
06:00 PM					370	370	281	224	292	
07:00 PM					286	286	219	185	230	
08:00 PM					154	154	178	123	152	
09:00 PM					135	135	122	79	112	
10:00 PM					102	102	101	50	84	
11:00 PM					58	58	71	22	50	
Day Total					7285	7285	5492	4579	5787	
% Weekday Average					100%					
% Week Average					125.9%	125.9%	94.9%	79.1%		
AM Peak Volume					08:00 AM 499	08:00 AM 499	11:00 AM 406	11:00 AM 431	11:00 AM 441	
PM Peak Volume					05:00 PM 607	05:00 PM 607	12:00 PM 521	01:00 PM 433	12:00 PM 491	



Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

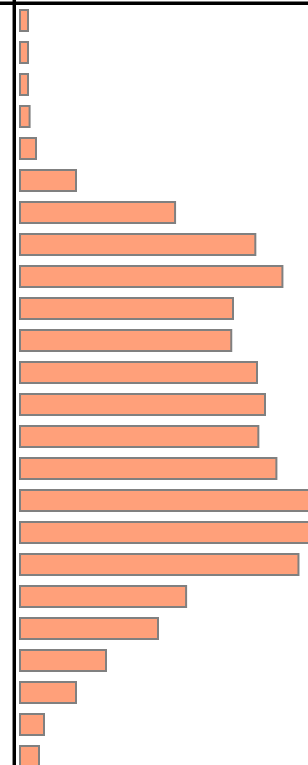
Type of report: Tube Count - Volume Data

LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **QC JOB #:** 14698206

SPECIFIC LOCATION: WB Dry Creek Rd btwn railroad crossing & Healdsburg Ave — **DIRECTION:** WB

CITY/STATE: Healdsburg, CA — **DATE:** Jan 25 2019 - Jan 31 2019

Start Time	Mon 28 Jan 19	Tue 29 Jan 19	Wed 30 Jan 19	Thu 31 Jan 19	Fri	Average Weekday Hourly Traffic	Sat	Sun	Average Week Hourly Traffic	Average Week Profile
12:00 AM	20	14	16	8		15			15	
01:00 AM	12	20	12	11		14			14	
02:00 AM	15	7	13	18		13			13	
03:00 AM	17	27	15	14		18			18	
04:00 AM	31	37	27	31		32			32	
05:00 AM	118	116	113	94		110			110	
06:00 AM	316	306	309	308		310			310	
07:00 AM	457	492	457	476		471			471	
08:00 AM	**516**	**539**	**532**	**510**		**524**			**524**	
09:00 AM	414	404	456	422		424			424	
10:00 AM	420	411	422	429		421			421	
11:00 AM	467	481	466	472		472			472	
12:00 PM	453	474	525	503		489			489	
01:00 PM	490	507	472	438		477			477	
02:00 PM	474	519	553	500		512			512	
03:00 PM	**554**	**617**	568	597		584			584	
04:00 PM	545	585	565	**657**		**588**			**588**	
05:00 PM	535	572	**578**	541		557			557	
06:00 PM	316	337	338	334		331			331	
07:00 PM	278	269	281	272		275			275	
08:00 PM	147	181	188	176		173			173	
09:00 PM	96	91	134	125		112			112	
10:00 PM	29	42	55	53		45			45	
11:00 PM	35	41	25	49		38			38	
Day Total	6755	7089	7120	7038		7005			7005	
% Weekday Average	96.4%	101.2%	101.6%	100.5%						
% Week Average	96.4%	101.2%	101.6%	100.5%		100%				
AM Peak Volume	08:00 AM 516	08:00 AM 539	08:00 AM 532	08:00 AM 510		08:00 AM 524			08:00 AM 524	
PM Peak Volume	03:00 PM 554	03:00 PM 617	05:00 PM 578	04:00 PM 657		04:00 PM 588			04:00 PM 588	



Comments:

Report generated on 2/6/2019 1:20 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

APPENDIX B: SYNCHRO 10 INTERSECTION ANALYSIS SHEETS – EXISTING CONDITIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	541	110	59	468	32	100	34	53	17	73	142
Future Volume (vph)	113	541	110	59	468	32	100	34	53	17	73	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.99		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		1.00	
Satd. Flow (prot)	1656	3388		1752	1810	1392		1610	1503		1541	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.66	1.00		0.98	
Satd. Flow (perm)	1656	3388		1752	1810	1392		1097	1503		1510	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	127	608	124	66	526	36	112	38	60	19	82	160
RTOR Reduction (vph)	0	35	0	0	0	23	0	0	42	0	91	0
Lane Group Flow (vph)	127	697	0	66	526	13	0	150	18	0	170	0
Confl. Peds. (#/hr)							4		3	3		4
Heavy Vehicles (%)	9%	4%	3%	3%	5%	16%	11%	21%	6%	24%	6%	12%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	4.9	18.5		3.1	16.7	16.7		14.1	14.1		14.1	
Effective Green, g (s)	4.9	18.5		3.1	16.7	16.7		14.1	14.1		14.1	
Actuated g/C Ratio	0.11	0.40		0.07	0.36	0.36		0.30	0.30		0.30	
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lane Grp Cap (vph)	175	1353		117	652	502		334	457		459	
v/s Ratio Prot	c0.08	0.21		0.04	c0.29							
v/s Ratio Perm						0.01		c0.14	0.01		0.11	
v/c Ratio	0.73	0.51		0.56	0.81	0.03		0.45	0.04		0.37	
Uniform Delay, d1	20.0	10.5		20.9	13.3	9.6		13.0	11.3		12.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	11.9	0.1		3.7	6.8	0.0		0.4	0.0		0.2	
Delay (s)	32.0	10.6		24.6	20.2	9.6		13.3	11.3		12.8	
Level of Service	C	B		C	C	A		B	B		B	
Approach Delay (s)		13.8			20.0			12.8			12.8	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	46.3	Sum of lost time (s)	10.6
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	253	190	57	218	48	197	188	41	60	230	131
Future Volume (vph)	119	253	190	57	218	48	197	188	41	60	230	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	1881	1524	1770	1828		1703	3384		1805	3193	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	1881	1524	1770	1828		1703	3384		1805	3193	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	145	309	232	70	266	59	240	229	50	73	280	160
RTOR Reduction (vph)	0	0	164	0	10	0	0	21	0	0	103	0
Lane Group Flow (vph)	145	309	68	70	315	0	240	258	0	73	337	0
Confl. Peds. (#/hr)			7			4			5			4
Heavy Vehicles (%)	8%	1%	4%	2%	1%	0%	6%	4%	0%	0%	3%	11%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	8.2	20.7	20.7	5.1	17.6		12.8	20.9		6.7	14.8	
Effective Green, g (s)	8.2	20.7	20.7	5.1	17.6		12.8	20.9		6.7	14.8	
Actuated g/C Ratio	0.12	0.29	0.29	0.07	0.25		0.18	0.30		0.10	0.21	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	195	554	449	128	458		310	1007		172	673	
v/s Ratio Prot	c0.09	c0.16		0.04	c0.17		c0.14	0.08		0.04	c0.11	
v/s Ratio Perm			0.04									
v/c Ratio	0.74	0.56	0.15	0.55	0.69		0.77	0.26		0.42	0.50	
Uniform Delay, d1	30.0	20.9	18.3	31.4	23.8		27.3	18.7		29.9	24.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.2	1.2	0.2	4.7	4.3		11.4	0.1		1.7	0.6	
Delay (s)	44.2	22.1	18.4	36.1	28.1		38.7	18.9		31.6	25.0	
Level of Service	D	C	B	D	C		D	B		C	C	
Approach Delay (s)		25.5			29.5			28.1			26.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	16.8
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
3: Grove St & Dry Creek Rd

02/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	443	99	63	524	30	108	54	109	35	79	143
Future Volume (vph)	88	443	99	63	524	30	108	54	109	35	79	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00	0.99		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.99	
Satd. Flow (prot)	1752	3441		1770	1881	1581		1778	1577		1693	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.69	1.00		0.95	
Satd. Flow (perm)	1752	3441		1770	1881	1581		1260	1577		1613	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	94	471	105	67	557	32	115	57	116	37	84	152
RTOR Reduction (vph)	0	41	0	0	0	20	0	0	79	0	71	0
Lane Group Flow (vph)	94	535	0	67	557	12	0	172	37	0	202	0
Confl. Peds. (#/hr)	1		2	2		1	2		3	3		2
Heavy Vehicles (%)	3%	2%	0%	2%	1%	0%	5%	0%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	3.3	16.7		3.0	16.4	16.4		14.0	14.0		14.0	
Effective Green, g (s)	3.3	16.7		3.0	16.4	16.4		14.0	14.0		14.0	
Actuated g/C Ratio	0.07	0.38		0.07	0.37	0.37		0.32	0.32		0.32	
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lane Grp Cap (vph)	130	1297		119	696	585		398	498		509	
v/s Ratio Prot	c0.05	0.16		0.04	c0.30							
v/s Ratio Perm						0.01		c0.14	0.02		0.13	
v/c Ratio	0.72	0.41		0.56	0.80	0.02		0.43	0.07		0.40	
Uniform Delay, d1	20.1	10.2		20.0	12.5	8.9		12.0	10.6		11.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	15.4	0.1		3.6	6.2	0.0		0.3	0.0		0.2	
Delay (s)	35.5	10.3		23.6	18.7	8.9		12.3	10.6		12.0	
Level of Service	D	B		C	B	A		B	B		B	
Approach Delay (s)		13.8			18.7			11.6			12.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	44.3	Sum of lost time (s)	10.6
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	180	144	51	259	38	213	291	54	68	293	126
Future Volume (vph)	197	180	144	51	259	38	213	291	54	68	293	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1517	1805	1832		1736	3496		1805	3329	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1863	1517	1805	1832		1736	3496		1805	3329	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	219	200	160	57	288	42	237	323	60	76	326	140
RTOR Reduction (vph)	0	0	106	0	7	0	0	18	0	0	62	0
Lane Group Flow (vph)	219	200	54	57	323	0	237	365	0	76	404	0
Confl. Peds. (#/hr)			2									3
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	1%	2%	5%	0%	2%	0%	4%	1%	0%	0%	1%	6%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	11.7	25.6	25.6	5.1	19.0		12.2	20.9		7.1	15.8	
Effective Green, g (s)	11.7	25.6	25.6	5.1	19.0		12.2	20.9		7.1	15.8	
Actuated g/C Ratio	0.15	0.34	0.34	0.07	0.25		0.16	0.28		0.09	0.21	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	276	631	514	121	461		280	967		169	696	
v/s Ratio Prot	c0.12	0.11		0.03	c0.18		c0.14	0.10		0.04	c0.12	
v/s Ratio Perm			0.04									
v/c Ratio	0.79	0.32	0.11	0.47	0.70		0.85	0.38		0.45	0.58	
Uniform Delay, d1	30.7	18.5	17.1	33.9	25.7		30.7	22.0		32.4	26.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.4	0.3	0.1	2.9	4.8		20.4	0.2		1.9	1.2	
Delay (s)	45.2	18.8	17.2	36.8	30.4		51.1	22.3		34.3	28.1	
Level of Service	D	B	B	D	C		D	C		C	C	
Approach Delay (s)		28.3			31.4			33.3			29.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	16.8
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	113	541	110	59	468	32	100	34	53	17	73	142
Future Volume (vph)	113	541	110	59	468	32	100	34	53	17	73	142
Confl. Peds. (#/hr)							4		3	3		4
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	4%	3%	3%	5%	16%	11%	21%	6%	24%	6%	12%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	127	608	124	66	526	36	112	38	60	19	82	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	127	732	0	66	526	36	0	150	60	0	261	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	127	732	66	526	36	150	60	261
v/c Ratio	0.56	0.52	0.33	0.82	0.07	0.45	0.12	0.47
Control Delay	35.3	11.6	27.4	26.7	1.6	20.9	3.8	11.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.3	11.6	27.4	26.7	1.6	20.9	3.8	11.5
Queue Length 50th (ft)	31	64	16	119	0	34	0	28
Queue Length 95th (ft)	#128	153	59	#290	6	91	16	91
Internal Link Dist (ft)		360		309		516		412
Turn Bay Length (ft)	100		150		60		150	
Base Capacity (vph)	277	2134	294	1127	893	337	517	555
Starvation Cap Reductn	0	0	0	11	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.34	0.22	0.47	0.04	0.45	0.12	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	113	541	110	59	468	32	100	34	53	17	73	142
Future Volume (vph)	113	541	110	59	468	32	100	34	53	17	73	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.99		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		1.00	
Satd. Flow (prot)	1656	3388		1752	1810	1392		1610	1503		1541	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.66	1.00		0.98	
Satd. Flow (perm)	1656	3388		1752	1810	1392		1097	1503		1510	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	127	608	124	66	526	36	112	38	60	19	82	160
RTOR Reduction (vph)	0	35	0	0	0	23	0	0	42	0	91	0
Lane Group Flow (vph)	127	697	0	66	526	13	0	150	18	0	170	0
Confl. Peds. (#/hr)							4		3	3		4
Heavy Vehicles (%)	9%	4%	3%	3%	5%	16%	11%	21%	6%	24%	6%	12%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	4.9	18.5		3.1	16.7	16.7		14.1	14.1		14.1	
Effective Green, g (s)	4.9	18.5		3.1	16.7	16.7		14.1	14.1		14.1	
Actuated g/C Ratio	0.11	0.40		0.07	0.36	0.36		0.30	0.30		0.30	
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lane Grp Cap (vph)	175	1353		117	652	502		334	457		459	
v/s Ratio Prot	c0.08	0.21		0.04	c0.29							
v/s Ratio Perm						0.01		c0.14	0.01		0.11	
v/c Ratio	0.73	0.51		0.56	0.81	0.03		0.45	0.04		0.37	
Uniform Delay, d1	20.0	10.5		20.9	13.3	9.6		13.0	11.3		12.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	11.9	0.1		3.7	6.8	0.0		0.4	0.0		0.2	
Delay (s)	32.0	10.6		24.6	20.2	9.6		13.3	11.3		12.8	
Level of Service	C	B		C	C	A		B	B		B	
Approach Delay (s)		13.8			20.0			12.8			12.8	
Approach LOS		B			C			B			B	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	46.3	Sum of lost time (s)	10.6
Intersection Capacity Utilization	67.1%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	119	253	190	57	218	48	197	188	41	60	230	131
Future Volume (vph)	119	253	190	57	218	48	197	188	41	60	230	131
Confl. Peds. (#/hr)			7			4			5			4
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	1%	4%	2%	1%	0%	6%	4%	0%	0%	3%	11%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	145	309	232	70	266	59	240	229	50	73	280	160
Shared Lane Traffic (%)												
Lane Group Flow (vph)	145	309	232	70	325	0	240	279	0	73	440	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	145	309	232	70	325	240	279	73	440
v/c Ratio	0.57	0.54	0.37	0.32	0.70	0.75	0.26	0.33	0.59
Control Delay	40.8	26.4	5.7	35.5	33.6	49.1	20.9	35.5	21.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	26.4	5.7	35.5	33.6	49.1	20.9	35.5	21.6
Queue Length 50th (ft)	58	112	0	28	122	100	46	29	64
Queue Length 95th (ft)	125	211	39	68	216	#249	80	70	101
Internal Link Dist (ft)		420			563		531		542
Turn Bay Length (ft)	120			115		150		150	
Base Capacity (vph)	313	671	693	332	613	319	1180	339	1132
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.46	0.33	0.21	0.53	0.75	0.24	0.22	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	119	253	190	57	218	48	197	188	41	60	230	131
Future Volume (vph)	119	253	190	57	218	48	197	188	41	60	230	131
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.97		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	1881	1524	1770	1828		1703	3384		1805	3193	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	1881	1524	1770	1828		1703	3384		1805	3193	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	145	309	232	70	266	59	240	229	50	73	280	160
RTOR Reduction (vph)	0	0	164	0	10	0	0	21	0	0	103	0
Lane Group Flow (vph)	145	309	68	70	315	0	240	258	0	73	337	0
Confl. Peds. (#/hr)			7			4			5			4
Heavy Vehicles (%)	8%	1%	4%	2%	1%	0%	6%	4%	0%	0%	3%	11%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	8.2	20.7	20.7	5.1	17.6		12.8	20.9		6.7	14.8	
Effective Green, g (s)	8.2	20.7	20.7	5.1	17.6		12.8	20.9		6.7	14.8	
Actuated g/C Ratio	0.12	0.29	0.29	0.07	0.25		0.18	0.30		0.10	0.21	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	195	554	449	128	458		310	1007		172	673	
v/s Ratio Prot	c0.09	c0.16		0.04	c0.17		c0.14	0.08		0.04	c0.11	
v/s Ratio Perm			0.04									
v/c Ratio	0.74	0.56	0.15	0.55	0.69		0.77	0.26		0.42	0.50	
Uniform Delay, d1	30.0	20.9	18.3	31.4	23.8		27.3	18.7		29.9	24.4	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.2	1.2	0.2	4.7	4.3		11.4	0.1		1.7	0.6	
Delay (s)	44.2	22.1	18.4	36.1	28.1		38.7	18.9		31.6	25.0	
Level of Service	D	C	B	D	C		D	B		C	C	
Approach Delay (s)		25.5			29.5			28.1			26.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	27.0	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	70.2	Sum of lost time (s)	16.8
Intersection Capacity Utilization	58.3%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	611	0	0	559	0	0	0	0	0	0	0
Future Volume (vph)	0	611	0	0	559	0	0	0	0	0	0	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.89	0.92	0.92	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	5%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	687	0	0	628	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	687	0	0	628	0	0	0	0	0	0	0

Intersection Summary

Lane Group	EBT	WBT
Lane Group Flow (vph)	687	628
v/c Ratio	0.24	0.42
Control Delay	4.1	6.2
Queue Delay	0.0	0.0
Total Delay	4.1	6.2
Queue Length 50th (ft)	0	0
Queue Length 95th (ft)	93	227
Internal Link Dist (ft)	309	420
Turn Bay Length (ft)		
Base Capacity (vph)	2866	1494
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.24	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	611	0	0	559	0	0	0	0	0	0	0
Future Volume (vph)	0	611	0	0	559	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0							
Lane Util. Factor		0.95			1.00							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3438			1792							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3438			1792							
Peak-hour factor, PHF	0.92	0.89	0.92	0.92	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	687	0	0	628	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	687	0	0	628	0	0	0	0	0	0	0
Heavy Vehicles (%)	2%	5%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Actuated Green, G (s)		32.5			32.5							
Effective Green, g (s)		32.5			32.5							
Actuated g/C Ratio		0.73			0.73							
Clearance Time (s)		4.0			4.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2494			1300							
v/s Ratio Prot		0.20			c0.35							
v/s Ratio Perm												
v/c Ratio		0.28			0.48							
Uniform Delay, d1		2.1			2.6							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			0.3							
Delay (s)		2.2			2.9							
Level of Service		A			A							
Approach Delay (s)		2.2			2.9			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	2.5	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.42		
Actuated Cycle Length (s)	44.8	Sum of lost time (s)	7.0
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	88	443	99	63	524	30	108	54	109	35	79	143
Future Volume (vph)	88	443	99	63	524	30	108	54	109	35	79	143
Confl. Peds. (#/hr)	1		2	2		1	2		3	3		2
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	2%	0%	2%	1%	0%	5%	0%	1%	3%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	94	471	105	67	557	32	115	57	116	37	84	152
Shared Lane Traffic (%)												
Lane Group Flow (vph)	94	576	0	67	557	32	0	172	116	0	273	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	94	576	67	557	32	172	116	273
v/c Ratio	0.41	0.43	0.31	0.79	0.05	0.43	0.20	0.46
Control Delay	27.9	10.5	26.5	23.0	1.1	19.0	4.8	12.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.9	10.5	26.5	23.1	1.1	19.0	4.8	12.6
Queue Length 50th (ft)	22	46	16	120	0	37	0	35
Queue Length 95th (ft)	#82	114	61	#322	5	102	29	109
Internal Link Dist (ft)		360		309		516		412
Turn Bay Length (ft)	100		150		60		150	
Base Capacity (vph)	312	2304	316	1247	1071	410	591	594
Starvation Cap Reductn	0	0	0	16	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.25	0.21	0.45	0.03	0.42	0.20	0.46

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	88	443	99	63	524	30	108	54	109	35	79	143
Future Volume (vph)	88	443	99	63	524	30	108	54	109	35	79	143
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00	0.99		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.99	
Satd. Flow (prot)	1752	3441		1770	1881	1581		1778	1577		1693	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.69	1.00		0.95	
Satd. Flow (perm)	1752	3441		1770	1881	1581		1260	1577		1613	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	94	471	105	67	557	32	115	57	116	37	84	152
RTOR Reduction (vph)	0	41	0	0	0	20	0	0	79	0	71	0
Lane Group Flow (vph)	94	535	0	67	557	12	0	172	37	0	202	0
Confl. Peds. (#/hr)	1		2	2		1	2		3	3		2
Heavy Vehicles (%)	3%	2%	0%	2%	1%	0%	5%	0%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	3.3	16.7		3.0	16.4	16.4		14.0	14.0		14.0	
Effective Green, g (s)	3.3	16.7		3.0	16.4	16.4		14.0	14.0		14.0	
Actuated g/C Ratio	0.07	0.38		0.07	0.37	0.37		0.32	0.32		0.32	
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lane Grp Cap (vph)	130	1297		119	696	585		398	498		509	
v/s Ratio Prot	c0.05	0.16		0.04	c0.30							
v/s Ratio Perm						0.01		c0.14	0.02		0.13	
v/c Ratio	0.72	0.41		0.56	0.80	0.02		0.43	0.07		0.40	
Uniform Delay, d1	20.1	10.2		20.0	12.5	8.9		12.0	10.6		11.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	15.4	0.1		3.6	6.2	0.0		0.3	0.0		0.2	
Delay (s)	35.5	10.3		23.6	18.7	8.9		12.3	10.6		12.0	
Level of Service	D	B		C	B	A		B	B		B	
Approach Delay (s)		13.8			18.7			11.6			12.0	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM 2000 Control Delay	14.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	44.3	Sum of lost time (s)	10.6
Intersection Capacity Utilization	70.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	197	180	144	51	259	38	213	291	54	68	293	126
Future Volume (vph)	197	180	144	51	259	38	213	291	54	68	293	126
Confl. Peds. (#/hr)			2									3
Confl. Bikes (#/hr)												5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	5%	0%	2%	0%	4%	1%	0%	0%	1%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	219	200	160	57	288	42	237	323	60	76	326	140
Shared Lane Traffic (%)												
Lane Group Flow (vph)	219	200	160	57	330	0	237	383	0	76	466	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	219	200	160	57	330	237	383	76	466
v/c Ratio	0.77	0.31	0.25	0.29	0.76	0.82	0.37	0.36	0.63
Control Delay	51.2	22.4	5.5	36.5	38.2	56.4	22.8	37.1	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.2	22.4	5.5	36.5	38.2	56.4	22.8	37.1	26.2
Queue Length 50th (ft)	95	69	0	24	132	104	71	32	84
Queue Length 95th (ft)	#247	153	45	64	253	#277	123	79	138
Internal Link Dist (ft)		420			563		531		542
Turn Bay Length (ft)	120			115		150		150	
Base Capacity (vph)	299	653	635	302	544	290	1098	302	1032
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.73	0.31	0.25	0.19	0.61	0.82	0.35	0.25	0.45

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	197	180	144	51	259	38	213	291	54	68	293	126
Future Volume (vph)	197	180	144	51	259	38	213	291	54	68	293	126
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1517	1805	1832		1736	3496		1805	3329	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1863	1517	1805	1832		1736	3496		1805	3329	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	219	200	160	57	288	42	237	323	60	76	326	140
RTOR Reduction (vph)	0	0	106	0	7	0	0	18	0	0	62	0
Lane Group Flow (vph)	219	200	54	57	323	0	237	365	0	76	404	0
Confl. Peds. (#/hr)			2									3
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	1%	2%	5%	0%	2%	0%	4%	1%	0%	0%	1%	6%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	11.7	25.6	25.6	5.1	19.0		12.2	20.9		7.1	15.8	
Effective Green, g (s)	11.7	25.6	25.6	5.1	19.0		12.2	20.9		7.1	15.8	
Actuated g/C Ratio	0.15	0.34	0.34	0.07	0.25		0.16	0.28		0.09	0.21	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	276	631	514	121	461		280	967		169	696	
v/s Ratio Prot	c0.12	0.11		0.03	c0.18		c0.14	0.10		0.04	c0.12	
v/s Ratio Perm			0.04									
v/c Ratio	0.79	0.32	0.11	0.47	0.70		0.85	0.38		0.45	0.58	
Uniform Delay, d1	30.7	18.5	17.1	33.9	25.7		30.7	22.0		32.4	26.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	14.4	0.3	0.1	2.9	4.8		20.4	0.2		1.9	1.2	
Delay (s)	45.2	18.8	17.2	36.8	30.4		51.1	22.3		34.3	28.1	
Level of Service	D	B	B	D	C		D	C		C	C	
Approach Delay (s)		28.3			31.4			33.3			29.0	
Approach LOS		C			C			C			C	

Intersection Summary			
HCM 2000 Control Delay	30.5	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	16.8
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	587	0	0	617	0	0	0	0	0	0	0
Future Volume (vph)	0	587	0	0	617	0	0	0	0	0	0	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.94	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	624	0	0	656	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	624	0	0	656	0	0	0	0	0	0	0

Intersection Summary

Lane Group	EBT	WBT
Lane Group Flow (vph)	624	656
v/c Ratio	0.21	0.42
Control Delay	3.7	5.7
Queue Delay	0.0	0.0
Total Delay	3.7	5.7
Queue Length 50th (ft)	0	0
Queue Length 95th (ft)	80	227
Internal Link Dist (ft)	309	420
Turn Bay Length (ft)		
Base Capacity (vph)	2903	1543
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.21	0.43

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	587	0	0	617	0	0	0	0	0	0	0
Future Volume (vph)	0	587	0	0	617	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0							
Lane Util. Factor		0.95			1.00							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3539			1881							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3539			1881							
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	624	0	0	656	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	624	0	0	656	0	0	0	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Actuated Green, G (s)		32.7			32.7							
Effective Green, g (s)		32.7			32.7							
Actuated g/C Ratio		0.74			0.74							
Clearance Time (s)		4.0			4.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2630			1397							
v/s Ratio Prot		0.18			c0.35							
v/s Ratio Perm												
v/c Ratio		0.24			0.47							
Uniform Delay, d1		1.8			2.2							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.0			0.3							
Delay (s)		1.8			2.5							
Level of Service		A			A							
Approach Delay (s)		1.8			2.5			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	2.2	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	44.0	Sum of lost time (s)	6.0
Intersection Capacity Utilization	35.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C: SYNCHRO 10 INTERSECTION ANALYSIS SHEETS – CUMULATIVE CONDITIONS

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	1040	150	70	590	40	120	40	100	30	110	180
Future Volume (vph)	160	1040	150	70	590	40	120	40	100	30	110	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.99		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		1.00	
Satd. Flow (prot)	1656	3410		1752	1810	1392		1611	1502		1552	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.39	1.00		0.96	
Satd. Flow (perm)	1656	3410		1752	1810	1392		644	1502		1495	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	180	1169	169	79	663	45	135	45	112	34	124	202
RTOR Reduction (vph)	0	20	0	0	0	26	0	0	84	0	79	0
Lane Group Flow (vph)	180	1318	0	79	663	19	0	180	28	0	281	0
Confl. Peds. (#/hr)							4		3	3		4
Heavy Vehicles (%)	9%	4%	3%	3%	5%	16%	11%	21%	6%	24%	6%	12%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	7.0	26.2		3.6	22.8	22.8		13.5	13.5		13.5	
Effective Green, g (s)	7.0	26.2		3.6	22.8	22.8		13.5	13.5		13.5	
Actuated g/C Ratio	0.13	0.49		0.07	0.42	0.42		0.25	0.25		0.25	
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lane Grp Cap (vph)	215	1657		117	765	588		161	376		374	
v/s Ratio Prot	c0.11	c0.39		0.05	0.37							
v/s Ratio Perm						0.01		c0.28	0.02		0.19	
v/c Ratio	0.84	0.80		0.68	0.87	0.03		1.12	0.07		0.75	
Uniform Delay, d1	22.9	11.6		24.6	14.2	9.1		20.2	15.4		18.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	22.8	2.5		11.4	9.8	0.0		106.1	0.0		7.3	
Delay (s)	45.7	14.2		36.0	24.0	9.1		126.3	15.5		26.0	
Level of Service	D	B		D	C	A		F	B		C	
Approach Delay (s)		17.9			24.4			83.8			26.0	
Approach LOS		B			C			F			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	53.9	Sum of lost time (s)	10.6
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	530	390	70	280	70	250	230	50	60	290	170
Future Volume (vph)	250	530	390	70	280	70	250	230	50	60	290	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	1881	1523	1770	1823		1703	3383		1805	3187	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	1881	1523	1770	1823		1703	3383		1805	3187	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	305	646	476	85	341	85	305	280	61	73	354	207
RTOR Reduction (vph)	0	0	323	0	11	0	0	21	0	0	107	0
Lane Group Flow (vph)	305	646	153	85	415	0	305	320	0	73	454	0
Confl. Peds. (#/hr)			7			4			5			4
Heavy Vehicles (%)	8%	1%	4%	2%	1%	0%	6%	4%	0%	0%	3%	11%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.1	25.8	25.8	7.6	21.3		12.1	22.7		7.2	17.8	
Effective Green, g (s)	12.1	25.8	25.8	7.6	21.3		12.1	22.7		7.2	17.8	
Actuated g/C Ratio	0.15	0.32	0.32	0.09	0.27		0.15	0.28		0.09	0.22	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	605	490	167	484		257	958		162	708	
v/s Ratio Prot	c0.18	c0.34		0.05	0.23		c0.18	0.09		0.04	c0.14	
v/s Ratio Perm			0.10									
v/c Ratio	1.21	1.07	0.31	0.51	0.86		1.19	0.33		0.45	0.64	
Uniform Delay, d1	34.0	27.1	20.5	34.5	28.0		34.0	22.7		34.6	28.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	125.6	56.0	0.4	2.4	14.0		116.2	0.2		2.0	2.0	
Delay (s)	159.6	83.2	20.8	36.9	41.9		150.2	22.9		36.6	30.3	
Level of Service	F	F	C	D	D		F	C		D	C	
Approach Delay (s)		78.7			41.1			83.0			31.0	
Approach LOS		E			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	64.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	80.1	Sum of lost time (s)	16.8
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	550	140	90	810	50	170	70	140	40	100	220
Future Volume (vph)	120	550	140	90	810	50	170	70	140	40	100	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00	0.99		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.99	
Satd. Flow (prot)	1752	3429		1770	1881	1580		1771	1576		1679	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.38	1.00		0.94	
Satd. Flow (perm)	1752	3429		1770	1881	1580		688	1576		1585	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	128	585	149	96	862	53	181	74	149	43	106	234
RTOR Reduction (vph)	0	41	0	0	0	28	0	0	112	0	98	0
Lane Group Flow (vph)	128	693	0	96	862	25	0	255	37	0	285	0
Confl. Peds. (#/hr)	1		2	2		1	2		3	3		2
Heavy Vehicles (%)	3%	2%	0%	2%	1%	0%	5%	0%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	5.1	25.6		4.8	25.3	25.3		13.6	13.6		13.6	
Effective Green, g (s)	5.1	25.6		4.8	25.3	25.3		13.6	13.6		13.6	
Actuated g/C Ratio	0.09	0.47		0.09	0.46	0.46		0.25	0.25		0.25	
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lane Grp Cap (vph)	163	1607		155	871	732		171	392		394	
v/s Ratio Prot	c0.07	0.20		0.05	c0.46							
v/s Ratio Perm						0.02		c0.37	0.02		0.18	
v/c Ratio	0.79	0.43		0.62	0.99	0.03		1.49	0.09		0.72	
Uniform Delay, d1	24.2	9.7		24.0	14.5	8.0		20.5	15.8		18.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	20.1	0.1		5.1	27.6	0.0		249.4	0.0		5.5	
Delay (s)	44.3	9.7		29.1	42.1	8.0		269.9	15.8		24.3	
Level of Service	D	A		C	D	A		F	B		C	
Approach Delay (s)		14.9			39.1			176.2			24.3	
Approach LOS		B			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	10.6
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	250	200	60	410	60	340	360	70	80	560	200
Future Volume (vph)	280	250	200	60	410	60	340	360	70	80	560	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1516	1805	1832		1736	3492		1805	3360	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1863	1516	1805	1832		1736	3492		1805	3360	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	311	278	222	67	456	67	378	400	78	89	622	222
RTOR Reduction (vph)	0	0	152	0	7	0	0	18	0	0	43	0
Lane Group Flow (vph)	311	278	70	67	516	0	378	460	0	89	801	0
Confl. Peds. (#/hr)			2									3
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	1%	2%	5%	0%	2%	0%	4%	1%	0%	0%	1%	6%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.0	26.7	26.7	7.4	22.1		12.0	25.9		8.0	21.9	
Effective Green, g (s)	12.0	26.7	26.7	7.4	22.1		12.0	25.9		8.0	21.9	
Actuated g/C Ratio	0.14	0.31	0.31	0.09	0.26		0.14	0.31		0.09	0.26	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	586	477	157	477		245	1066		170	867	
v/s Ratio Prot	c0.17	0.15		0.04	c0.28		c0.22	c0.13		0.05	c0.24	
v/s Ratio Perm			0.05									
v/c Ratio	1.23	0.47	0.15	0.43	1.08		1.54	0.43		0.52	0.92	
Uniform Delay, d1	36.4	23.4	20.9	36.7	31.3		36.4	23.6		36.6	30.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	134.8	0.6	0.1	1.9	65.3		263.6	0.3		2.9	15.2	
Delay (s)	171.2	24.0	21.0	38.6	96.6		300.0	23.8		39.5	45.8	
Level of Service	F	C	C	D	F		F	C		D	D	
Approach Delay (s)		79.6			90.0			145.8			45.2	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	89.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	84.8	Sum of lost time (s)	16.8
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	160	1040	150	70	590	40	120	40	100	30	110	180
Future Volume (vph)	160	1040	150	70	590	40	120	40	100	30	110	180
Confl. Peds. (#/hr)							4		3	3		4
Confl. Bikes (#/hr)												
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	9%	4%	3%	3%	5%	16%	11%	21%	6%	24%	6%	12%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	180	1169	169	79	663	45	135	45	112	34	124	202
Shared Lane Traffic (%)												
Lane Group Flow (vph)	180	1338	0	79	663	45	0	180	112	0	360	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	180	1338	79	663	45	180	112	360
v/c Ratio	0.82	0.78	0.43	0.91	0.07	1.09	0.24	0.78
Control Delay	58.9	17.7	32.4	34.2	2.2	125.3	5.5	27.2
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0
Total Delay	58.9	17.7	32.4	34.3	2.2	125.3	5.5	27.2
Queue Length 50th (ft)	57	169	24	167	0	~77	0	79
Queue Length 95th (ft)	#189	#412	68	#447	10	#168	29	161
Internal Link Dist (ft)		360		309		516		412
Turn Bay Length (ft)	100		150		60		150	
Base Capacity (vph)	225	1775	238	915	739	165	468	462
Starvation Cap Reductn	0	0	0	22	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.75	0.33	0.74	0.06	1.09	0.24	0.78

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	160	1040	150	70	590	40	120	40	100	30	110	180
Future Volume (vph)	160	1040	150	70	590	40	120	40	100	30	110	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	0.99		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.96	1.00		1.00	
Satd. Flow (prot)	1656	3410		1752	1810	1392		1611	1502		1552	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.39	1.00		0.96	
Satd. Flow (perm)	1656	3410		1752	1810	1392		644	1502		1495	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	180	1169	169	79	663	45	135	45	112	34	124	202
RTOR Reduction (vph)	0	20	0	0	0	26	0	0	84	0	79	0
Lane Group Flow (vph)	180	1318	0	79	663	19	0	180	28	0	281	0
Confl. Peds. (#/hr)							4		3	3		4
Heavy Vehicles (%)	9%	4%	3%	3%	5%	16%	11%	21%	6%	24%	6%	12%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	7.0	26.2		3.6	22.8	22.8		13.5	13.5		13.5	
Effective Green, g (s)	7.0	26.2		3.6	22.8	22.8		13.5	13.5		13.5	
Actuated g/C Ratio	0.13	0.49		0.07	0.42	0.42		0.25	0.25		0.25	
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lane Grp Cap (vph)	215	1657		117	765	588		161	376		374	
v/s Ratio Prot	c0.11	c0.39		0.05	0.37							
v/s Ratio Perm						0.01		c0.28	0.02		0.19	
v/c Ratio	0.84	0.80		0.68	0.87	0.03		1.12	0.07		0.75	
Uniform Delay, d1	22.9	11.6		24.6	14.2	9.1		20.2	15.4		18.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	22.8	2.5		11.4	9.8	0.0		106.1	0.0		7.3	
Delay (s)	45.7	14.2		36.0	24.0	9.1		126.3	15.5		26.0	
Level of Service	D	B		D	C	A		F	B		C	
Approach Delay (s)		17.9			24.4			83.8			26.0	
Approach LOS		B			C			F			C	

Intersection Summary			
HCM 2000 Control Delay	27.1	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	53.9	Sum of lost time (s)	10.6
Intersection Capacity Utilization	81.8%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	250	530	390	70	280	70	250	230	50	60	290	170
Future Volume (vph)	250	530	390	70	280	70	250	230	50	60	290	170
Confl. Peds. (#/hr)			7			4			5			4
Confl. Bikes (#/hr)												
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	8%	1%	4%	2%	1%	0%	6%	4%	0%	0%	3%	11%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	305	646	476	85	341	85	305	280	61	73	354	207
Shared Lane Traffic (%)												
Lane Group Flow (vph)	305	646	476	85	426	0	305	341	0	73	561	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	305	646	476	85	426	305	341	73	561
v/c Ratio	1.18	1.05	0.58	0.42	0.88	1.16	0.34	0.37	0.71
Control Delay	149.0	79.8	5.9	40.3	49.4	141.0	22.6	39.2	26.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	149.0	79.8	5.9	40.3	49.4	141.0	22.6	39.2	26.4
Queue Length 50th (ft)	~183	~374	0	39	191	~181	65	34	101
Queue Length 95th (ft)	#334	#585	45	79	#324	#332	98	70	136
Internal Link Dist (ft)		420			563		531		542
Turn Bay Length (ft)	120			115		150		150	
Base Capacity (vph)	258	618	820	273	507	262	1010	278	962
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.18	1.05	0.58	0.31	0.84	1.16	0.34	0.26	0.58

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	250	530	390	70	280	70	250	230	50	60	290	170
Future Volume (vph)	250	530	390	70	280	70	250	230	50	60	290	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98	1.00	1.00		1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	0.97		1.00	0.94	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1671	1881	1523	1770	1823		1703	3383		1805	3187	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1671	1881	1523	1770	1823		1703	3383		1805	3187	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	305	646	476	85	341	85	305	280	61	73	354	207
RTOR Reduction (vph)	0	0	323	0	11	0	0	21	0	0	107	0
Lane Group Flow (vph)	305	646	153	85	415	0	305	320	0	73	454	0
Confl. Peds. (#/hr)			7			4			5			4
Heavy Vehicles (%)	8%	1%	4%	2%	1%	0%	6%	4%	0%	0%	3%	11%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.1	25.8	25.8	7.6	21.3		12.1	22.7		7.2	17.8	
Effective Green, g (s)	12.1	25.8	25.8	7.6	21.3		12.1	22.7		7.2	17.8	
Actuated g/C Ratio	0.15	0.32	0.32	0.09	0.27		0.15	0.28		0.09	0.22	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	605	490	167	484		257	958		162	708	
v/s Ratio Prot	c0.18	c0.34		0.05	0.23		c0.18	0.09		0.04	c0.14	
v/s Ratio Perm			0.10									
v/c Ratio	1.21	1.07	0.31	0.51	0.86		1.19	0.33		0.45	0.64	
Uniform Delay, d1	34.0	27.1	20.5	34.5	28.0		34.0	22.7		34.6	28.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	125.6	56.0	0.4	2.4	14.0		116.2	0.2		2.0	2.0	
Delay (s)	159.6	83.2	20.8	36.9	41.9		150.2	22.9		36.6	30.3	
Level of Service	F	F	C	D	D		F	C		D	C	
Approach Delay (s)		78.7			41.1			83.0			31.0	
Approach LOS		E			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	64.2	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	1.04		
Actuated Cycle Length (s)	80.1	Sum of lost time (s)	16.8
Intersection Capacity Utilization	75.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	1170	0	0	700	0	0	0	0	0	0	0
Future Volume (vph)	0	1170	0	0	700	0	0	0	0	0	0	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.89	0.92	0.92	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	5%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	1315	0	0	787	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	1315	0	0	787	0	0	0	0	0	0	0

Intersection Summary

Lane Group	EBT	WBT
Lane Group Flow (vph)	1315	787
v/c Ratio	0.48	0.56
Control Delay	6.1	8.3
Queue Delay	0.2	0.3
Total Delay	6.4	8.6
Queue Length 50th (ft)	155	195
Queue Length 95th (ft)	203	304
Internal Link Dist (ft)	309	420
Turn Bay Length (ft)		
Base Capacity (vph)	2710	1412
Starvation Cap Reductn	617	194
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.63	0.65

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	1170	0	0	700	0	0	0	0	0	0	0
Future Volume (vph)	0	1170	0	0	700	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0							
Lane Util. Factor		0.95			1.00							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3438			1792							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3438			1792							
Peak-hour factor, PHF	0.92	0.89	0.92	0.92	0.89	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	1315	0	0	787	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	1315	0	0	787	0	0	0	0	0	0	0
Heavy Vehicles (%)	2%	5%	2%	2%	6%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Actuated Green, G (s)		42.8			42.8							
Effective Green, g (s)		42.8			42.8							
Actuated g/C Ratio		0.74			0.74							
Clearance Time (s)		4.0			4.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2532			1320							
v/s Ratio Prot		0.38			c0.44							
v/s Ratio Perm												
v/c Ratio		0.52			0.60							
Uniform Delay, d1		3.3			3.6							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.2			0.7							
Delay (s)		3.4			4.3							
Level of Service		A			A							
Approach Delay (s)		3.4			4.3			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	3.8	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	58.1	Sum of lost time (s)	6.0
Intersection Capacity Utilization	40.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	120	550	140	90	810	50	170	70	140	40	100	220
Future Volume (vph)	120	550	140	90	810	50	170	70	140	40	100	220
Confl. Peds. (#/hr)	1		2	2		1	2		3	3		2
Confl. Bikes (#/hr)												
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	3%	2%	0%	2%	1%	0%	5%	0%	1%	3%	1%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	128	585	149	96	862	53	181	74	149	43	106	234
Shared Lane Traffic (%)												
Lane Group Flow (vph)	128	734	0	96	862	53	0	255	149	0	383	0

Intersection Summary

Lane Group	EBL	EBT	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	128	734	96	862	53	255	149	383
v/c Ratio	0.64	0.44	0.51	0.98	0.07	1.48	0.29	0.77
Control Delay	42.8	10.6	35.3	45.4	2.8	269.0	5.3	25.2
Queue Delay	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0
Total Delay	42.8	10.6	35.3	51.2	2.8	269.0	5.3	25.2
Queue Length 50th (ft)	40	66	30	255	0	~130	0	80
Queue Length 95th (ft)	#128	151	#87	#633	14	#247	33	164
Internal Link Dist (ft)		360		309		516		412
Turn Bay Length (ft)	100		150		60		150	
Base Capacity (vph)	232	1754	235	929	817	172	507	496
Starvation Cap Reductn	0	0	0	47	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.42	0.41	0.98	0.06	1.48	0.29	0.77

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	120	550	140	90	810	50	170	70	140	40	100	220
Future Volume (vph)	120	550	140	90	810	50	170	70	140	40	100	220
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Lane Util. Factor	1.00	0.95		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.98		1.00	0.99		0.99	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt	1.00	0.97		1.00	1.00	0.85		1.00	0.85		0.92	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.97	1.00		0.99	
Satd. Flow (prot)	1752	3429		1770	1881	1580		1771	1576		1679	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.38	1.00		0.94	
Satd. Flow (perm)	1752	3429		1770	1881	1580		688	1576		1585	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	128	585	149	96	862	53	181	74	149	43	106	234
RTOR Reduction (vph)	0	41	0	0	0	28	0	0	112	0	98	0
Lane Group Flow (vph)	128	693	0	96	862	25	0	255	37	0	285	0
Confl. Peds. (#/hr)	1		2	2		1	2		3	3		2
Heavy Vehicles (%)	3%	2%	0%	2%	1%	0%	5%	0%	1%	3%	1%	2%
Turn Type	Prot	NA		Prot	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases	5	2		1	6			8			4	
Permitted Phases						6	8		8	4		
Actuated Green, G (s)	5.1	25.6		4.8	25.3	25.3		13.6	13.6		13.6	
Effective Green, g (s)	5.1	25.6		4.8	25.3	25.3		13.6	13.6		13.6	
Actuated g/C Ratio	0.09	0.47		0.09	0.46	0.46		0.25	0.25		0.25	
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0		3.6	3.6		3.6	
Vehicle Extension (s)	1.0	1.0		1.0	1.0	1.0		1.0	1.0		1.0	
Lane Grp Cap (vph)	163	1607		155	871	732		171	392		394	
v/s Ratio Prot	c0.07	0.20		0.05	c0.46							
v/s Ratio Perm						0.02		c0.37	0.02		0.18	
v/c Ratio	0.79	0.43		0.62	0.99	0.03		1.49	0.09		0.72	
Uniform Delay, d1	24.2	9.7		24.0	14.5	8.0		20.5	15.8		18.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2	20.1	0.1		5.1	27.6	0.0		249.4	0.0		5.5	
Delay (s)	44.3	9.7		29.1	42.1	8.0		269.9	15.8		24.3	
Level of Service	D	A		C	D	A		F	B		C	
Approach Delay (s)		14.9			39.1			176.2			24.3	
Approach LOS		B			D			F			C	

Intersection Summary			
HCM 2000 Control Delay	49.9	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	54.6	Sum of lost time (s)	10.6
Intersection Capacity Utilization	97.4%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Volume
6: Healdsburg Ave & Dry Creek Rd

02/26/2019

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	280	250	200	60	410	60	340	360	70	80	560	200
Future Volume (vph)	280	250	200	60	410	60	340	360	70	80	560	200
Confl. Peds. (#/hr)			2									3
Confl. Bikes (#/hr)												5
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	1%	2%	5%	0%	2%	0%	4%	1%	0%	0%	1%	6%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	311	278	222	67	456	67	378	400	78	89	622	222
Shared Lane Traffic (%)												
Lane Group Flow (vph)	311	278	222	67	523	0	378	478	0	89	844	0

Intersection Summary

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	311	278	222	67	523	378	478	89	844
v/c Ratio	1.21	0.47	0.35	0.36	1.10	1.51	0.43	0.45	0.94
Control Delay	158.0	27.6	5.4	40.1	104.0	277.7	24.2	41.8	48.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	158.0	27.6	5.4	40.1	104.0	277.7	24.2	41.8	48.4
Queue Length 50th (ft)	~195	117	0	33	~309	~272	101	43	211
Queue Length 95th (ft)	#378	214	53	72	#520	#473	156	90	#326
Internal Link Dist (ft)		420			563		531		542
Turn Bay Length (ft)	120			115		150		150	
Base Capacity (vph)	258	597	637	260	474	251	1108	260	896
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.21	0.47	0.35	0.26	1.10	1.51	0.43	0.34	0.94

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	280	250	200	60	410	60	340	360	70	80	560	200
Future Volume (vph)	280	250	200	60	410	60	340	360	70	80	560	200
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00		1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.98		1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1787	1863	1516	1805	1832		1736	3492		1805	3360	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1787	1863	1516	1805	1832		1736	3492		1805	3360	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	311	278	222	67	456	67	378	400	78	89	622	222
RTOR Reduction (vph)	0	0	152	0	7	0	0	18	0	0	43	0
Lane Group Flow (vph)	311	278	70	67	516	0	378	460	0	89	801	0
Confl. Peds. (#/hr)			2									3
Confl. Bikes (#/hr)												5
Heavy Vehicles (%)	1%	2%	5%	0%	2%	0%	4%	1%	0%	0%	1%	6%
Turn Type	Prot	NA	Perm	Prot	NA		Prot	NA		Prot	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.0	26.7	26.7	7.4	22.1		12.0	25.9		8.0	21.9	
Effective Green, g (s)	12.0	26.7	26.7	7.4	22.1		12.0	25.9		8.0	21.9	
Actuated g/C Ratio	0.14	0.31	0.31	0.09	0.26		0.14	0.31		0.09	0.26	
Clearance Time (s)	4.0	4.2	4.2	4.0	4.2		4.0	4.6		4.0	4.6	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	252	586	477	157	477		245	1066		170	867	
v/s Ratio Prot	c0.17	0.15		0.04	c0.28		c0.22	c0.13		0.05	c0.24	
v/s Ratio Perm			0.05									
v/c Ratio	1.23	0.47	0.15	0.43	1.08		1.54	0.43		0.52	0.92	
Uniform Delay, d1	36.4	23.4	20.9	36.7	31.3		36.4	23.6		36.6	30.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	134.8	0.6	0.1	1.9	65.3		263.6	0.3		2.9	15.2	
Delay (s)	171.2	24.0	21.0	38.6	96.6		300.0	23.8		39.5	45.8	
Level of Service	F	C	C	D	F		F	C		D	D	
Approach Delay (s)		79.6			90.0			145.8			45.2	
Approach LOS		E			F			F			D	

Intersection Summary			
HCM 2000 Control Delay	89.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.09		
Actuated Cycle Length (s)	84.8	Sum of lost time (s)	16.8
Intersection Capacity Utilization	95.5%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Volume (vph)	0	730	0	0	950	0	0	0	0	0	0	0
Future Volume (vph)	0	730	0	0	950	0	0	0	0	0	0	0
Confl. Peds. (#/hr)												
Confl. Bikes (#/hr)												
Peak Hour Factor	0.92	0.94	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Growth Factor	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Bus Blockages (#/hr)	0	0	0	0	0	0	0	0	0	0	0	0
Parking (#/hr)												
Mid-Block Traffic (%)		0%			0%			0%			0%	
Adj. Flow (vph)	0	777	0	0	1011	0	0	0	0	0	0	0
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	777	0	0	1011	0	0	0	0	0	0	0

Intersection Summary

Lane Group	EBT	WBT
Lane Group Flow (vph)	777	1011
v/c Ratio	0.27	0.67
Control Delay	3.9	9.5
Queue Delay	0.0	0.8
Total Delay	3.9	10.3
Queue Length 50th (ft)	65	274
Queue Length 95th (ft)	90	451
Internal Link Dist (ft)	309	420
Turn Bay Length (ft)		
Base Capacity (vph)	2817	1497
Starvation Cap Reductn	0	211
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.28	0.79

Intersection Summary

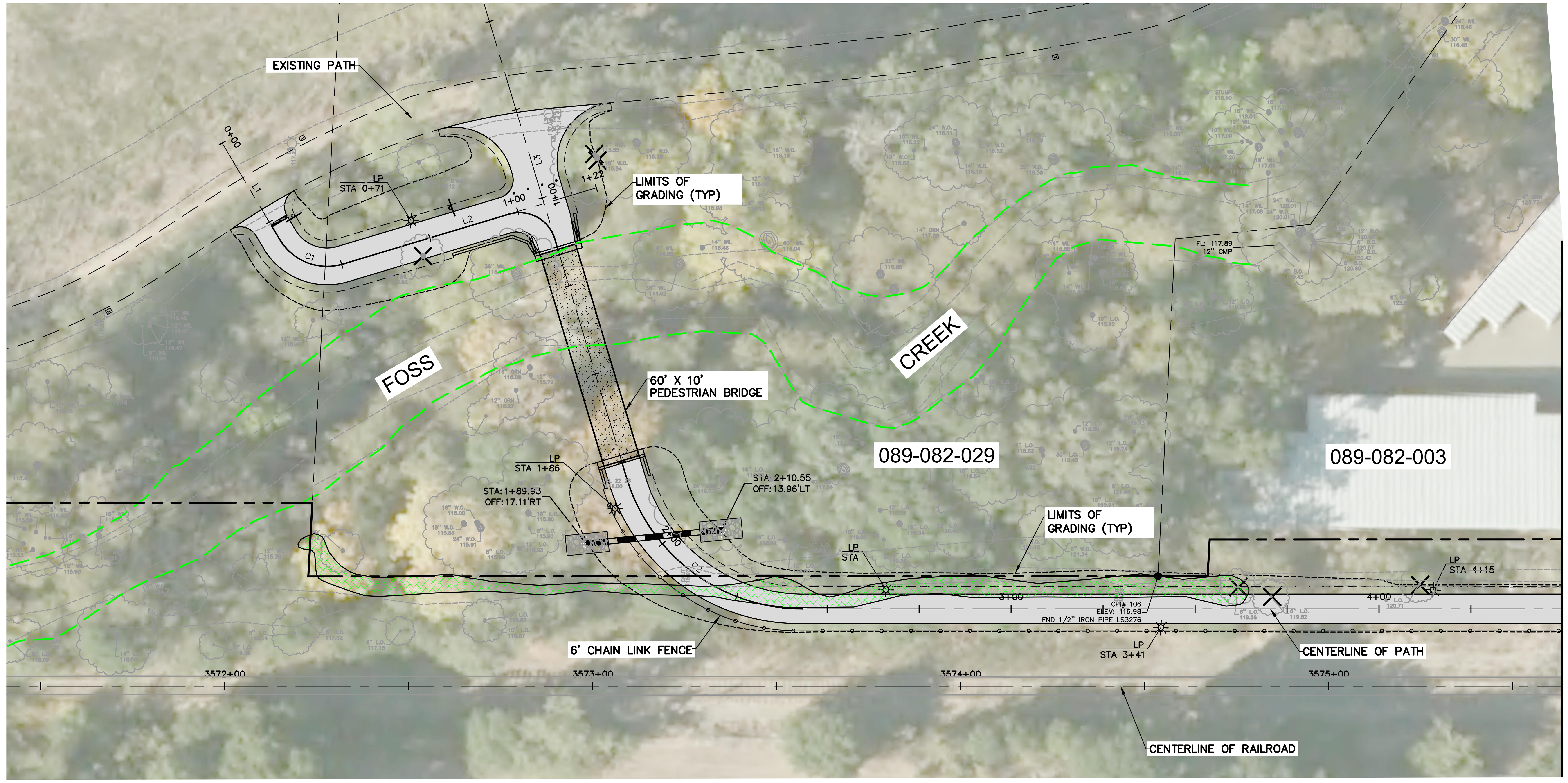
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑							
Traffic Volume (vph)	0	730	0	0	950	0	0	0	0	0	0	0
Future Volume (vph)	0	730	0	0	950	0	0	0	0	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0							
Lane Util. Factor		0.95			1.00							
Frt		1.00			1.00							
Flt Protected		1.00			1.00							
Satd. Flow (prot)		3539			1881							
Flt Permitted		1.00			1.00							
Satd. Flow (perm)		3539			1881							
Peak-hour factor, PHF	0.92	0.94	0.92	0.92	0.94	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	777	0	0	1011	0	0	0	0	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	777	0	0	1011	0	0	0	0	0	0	0
Heavy Vehicles (%)	2%	2%	2%	2%	1%	2%	2%	2%	2%	2%	2%	2%
Turn Type		NA			NA							
Protected Phases		2			6							
Permitted Phases												
Actuated Green, G (s)		45.5			45.5							
Effective Green, g (s)		45.5			45.5							
Actuated g/C Ratio		0.76			0.76							
Clearance Time (s)		4.0			4.0							
Vehicle Extension (s)		3.0			3.0							
Lane Grp Cap (vph)		2679			1424							
v/s Ratio Prot		0.22			c0.54							
v/s Ratio Perm												
v/c Ratio		0.29			0.71							
Uniform Delay, d1		2.3			3.8							
Progression Factor		1.00			1.00							
Incremental Delay, d2		0.1			1.7							
Delay (s)		2.3			5.5							
Level of Service		A			A							
Approach Delay (s)		2.3			5.5			0.0			0.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM 2000 Control Delay	4.1	HCM 2000 Level of Service	A
HCM 2000 Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	60.1	Sum of lost time (s)	6.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

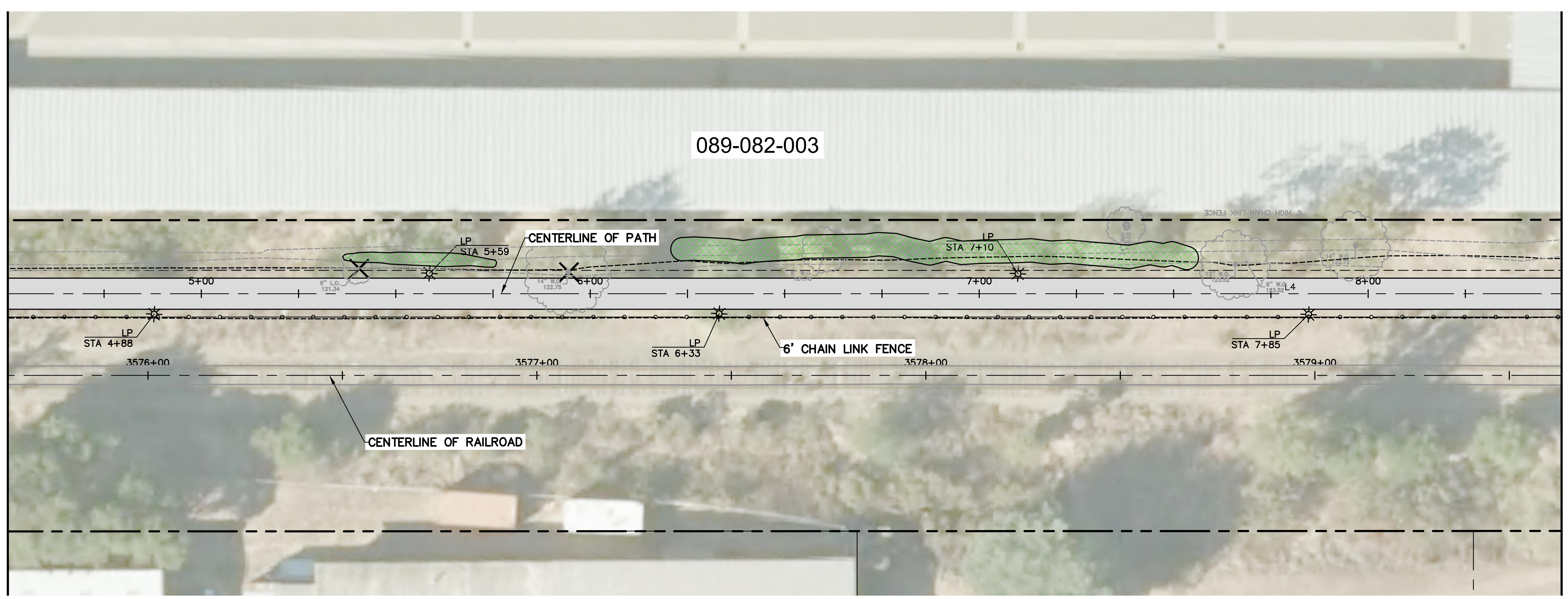
APPENDIX F

Site Plans

HORIZONTAL SCALE: 1"=20'



MATCH LINE - STA 4+50
SEE BELOW LEFT



MATCH LINE - STA 4+50
SEE ABOVE LEFT

MATCH LINE - STA 8+50
SEE SHEET 2

FOR REDUCED PLANS, THE ORIGINAL SCALE IS IN INCHES

PREPARED UNDER THE DIRECTION OF

DATE

DESIGNED BY JWM | DRAWN BY JWM | REVIEWED BY HEU

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

CITY OF HEALDSBURG
FOSS CREEK PATHWAY - SEGMENTS 7 & 8
CITY OF HEALDSBURG CALIFORNIA

SITE PLAN

PROJECT NUMBER
09-3642

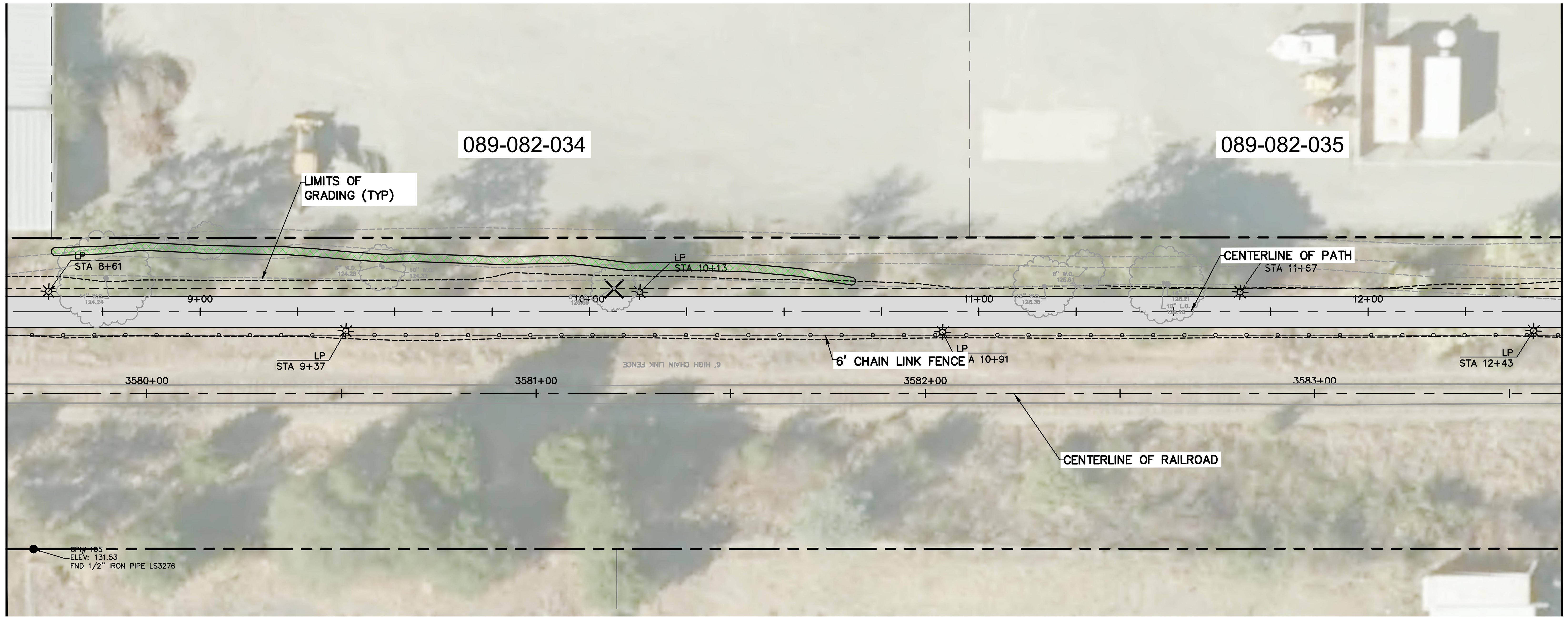
DRAWING DATE
MARCH 2019

SHEET NUMBER
1 OF 6

ORIGINAL PLOT DATE:

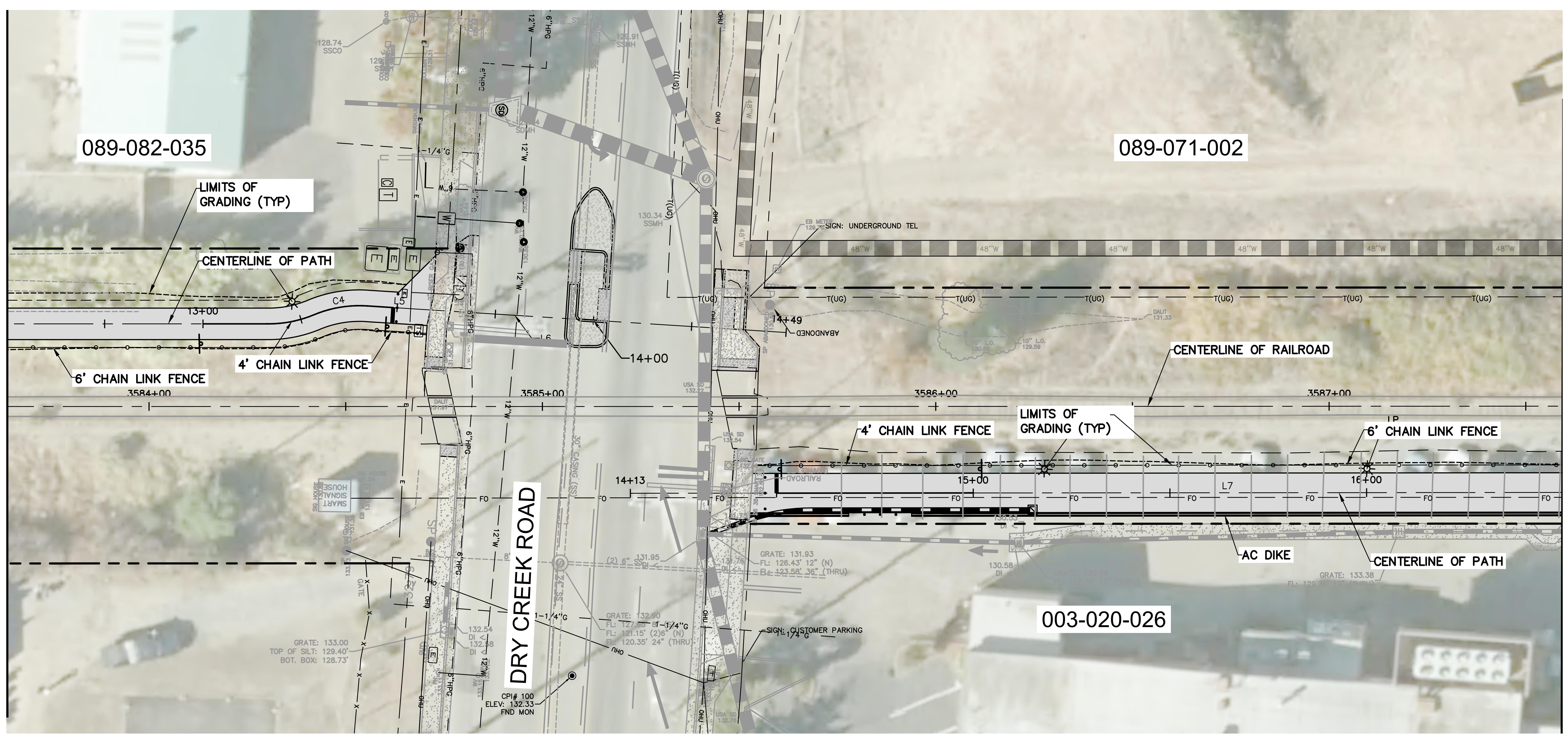
20 0 20 40
HORIZONTAL SCALE: 1"=20'

MATCH LINE - STA 8+50
SEE SHEET 1



MATCH LINE - STA 12+50
SEE BELOW LEFT

MATCH LINE - STA 12+50
SEE ABOVE RIGHT



MATCH LINE - STA 16+50
SEE SHEET 3

FOR REDUCED PLANS, THE ORIGINAL SCALE IS IN INCHES
0 1 2 3

PREPARED UNDER THE DIRECTION OF

DATE

DESIGNED BY JWM
DRAWN BY JWM
REVIEWED BY HEU

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005
707.571.8037 Fax

CITY OF HEALDSBURG
FOSS CREEK PATHWAY - SEGMENTS 7 & 8
CITY OF HEALDSBURG CALIFORNIA

SITE PLAN

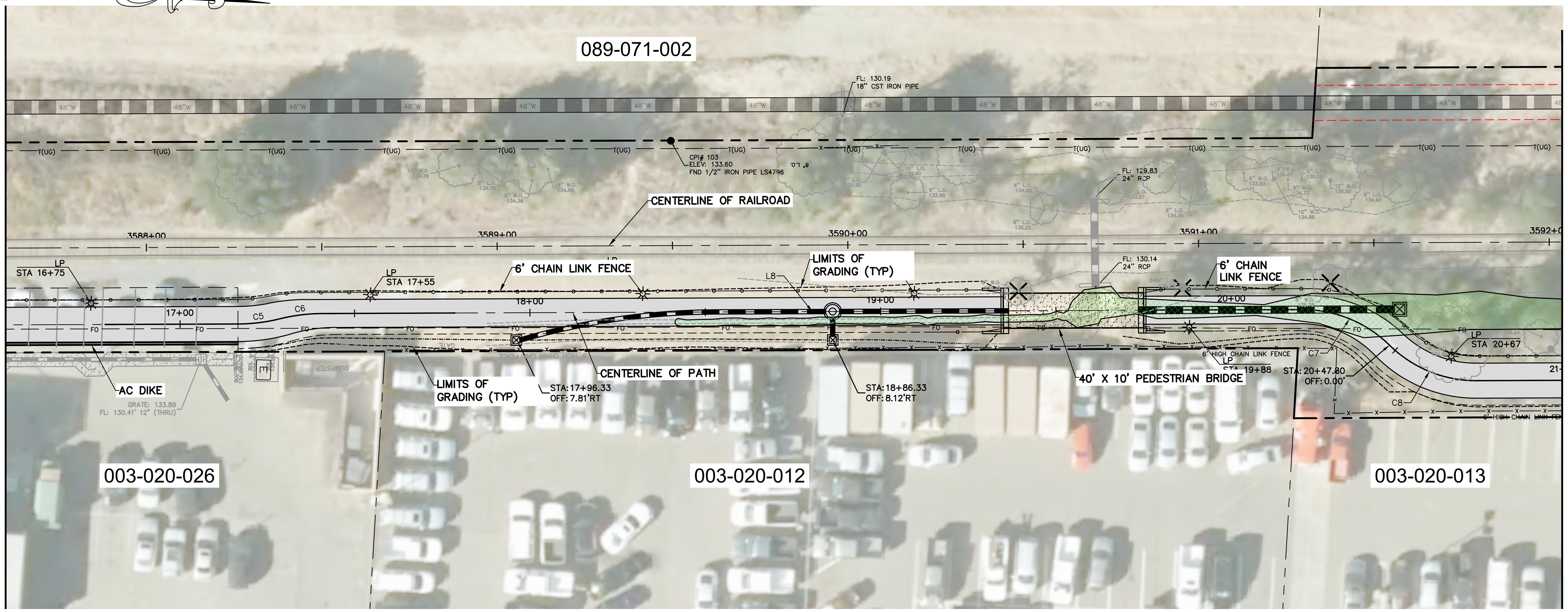
PROJECT NUMBER 09-3642

DRAWING DATE MARCH 2019

SHEET NUMBER 2 OF 6

20 0 20 40
HORIZONTAL SCALE: 1"=20'

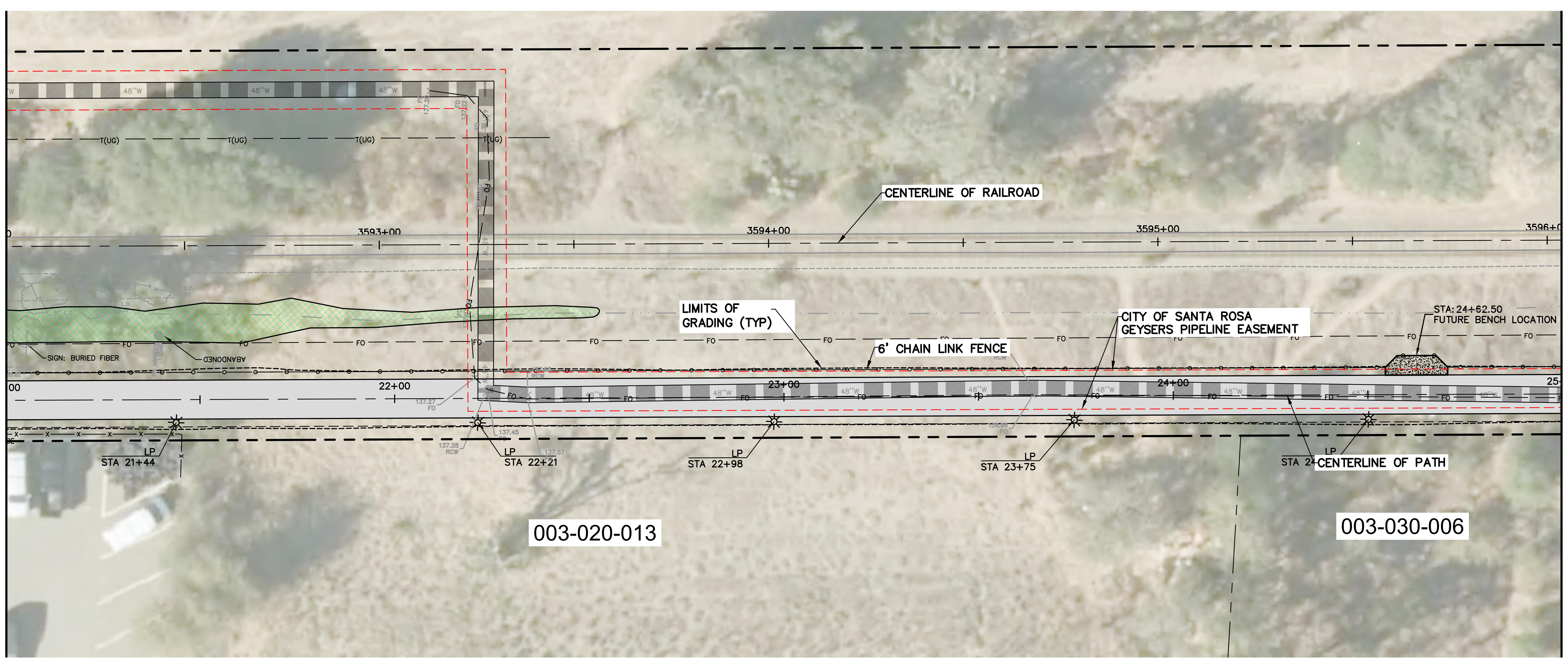
MATCH LINE - STA 16+50
SEE SHEET 2



MATCH LINE - STA 21+00
SEE BELOW LEFT

FOR REDUCED PLANS, THE
ORIGINAL SCALE IS IN INCHES
0 1 2 3

MATCH LINE - STA 21+00
SEE ABOVE RIGHT



MATCH LINE - STA 25+00
SEE SHEET 4

PREPARED UNDER THE DIRECTION OF

DATE

DESIGNED BY	DRAWN BY	REVIEWED BY
JWM	JWM	HEU

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005
707.571.8037 Fax

CITY OF HEALDSBURG
FOSS CREEK PATHWAY - SEGMENTS 7 & 8
CITY OF HEALDSBURG CALIFORNIA

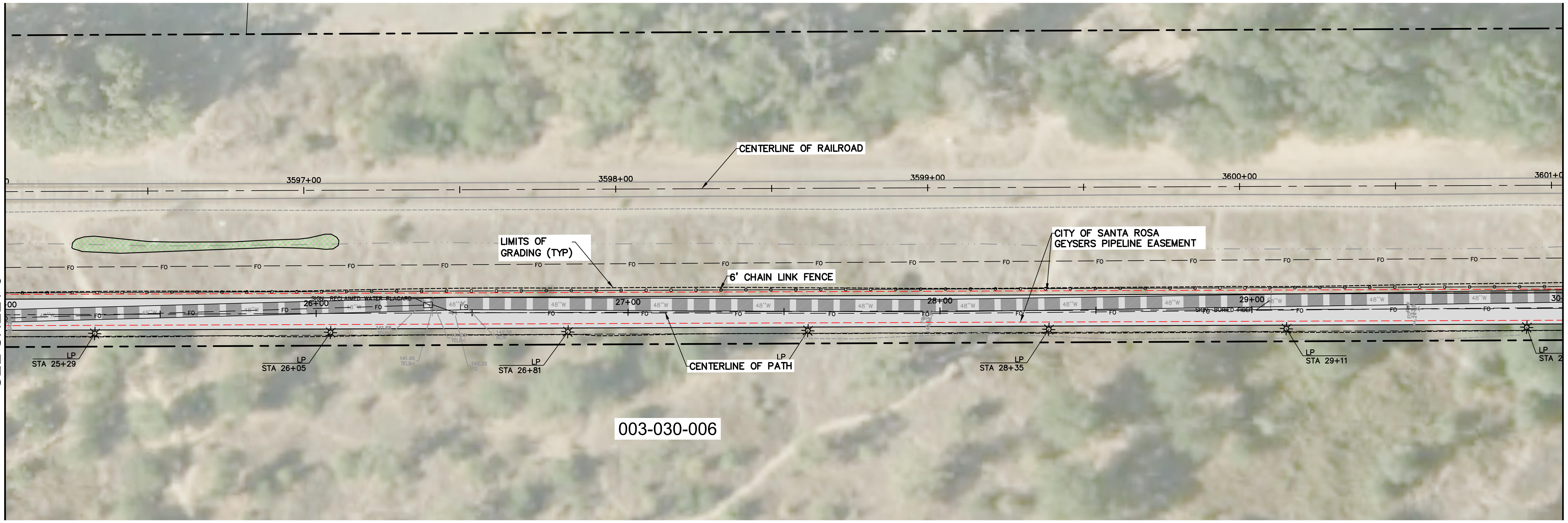
SITE PLAN

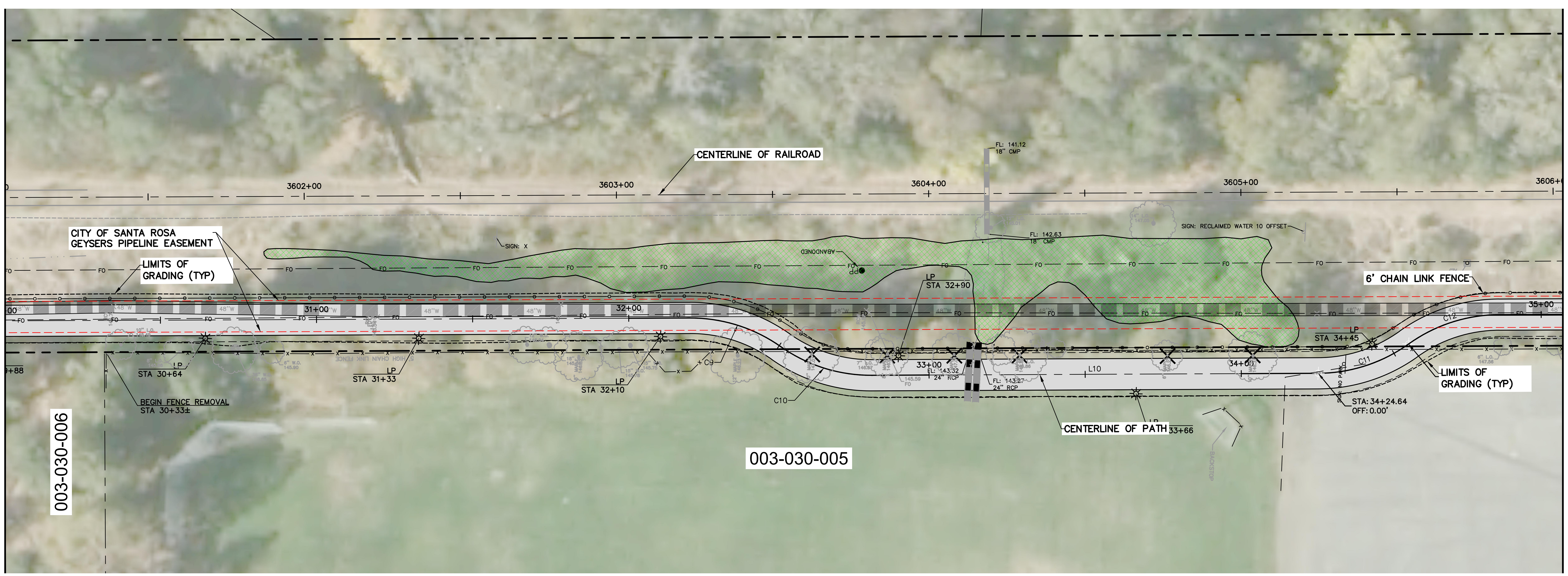
PROJECT NUMBER
09-3642

DRAWING DATE
MARCH 2019

SHEET NUMBER
3 OF 6

20 0 20 40
HORIZONTAL SCALE: 1"=20'





FOR REDUCED PLANS, THE ORIGINAL SCALE IS IN INCHES

0 1 2 3

ORIGINAL PLOT DATE:

PREPARED UNDER THE DIRECTION OF

DATE

DESIGNED BY JWM | DRAWN BY JWM | REVIEWED BY HEU

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

CITY OF HEALDSBURG
FOSS CREEK PATHWAY - SEGMENTS 7 & 8
CITY OF HEALDSBURG CALIFORNIA

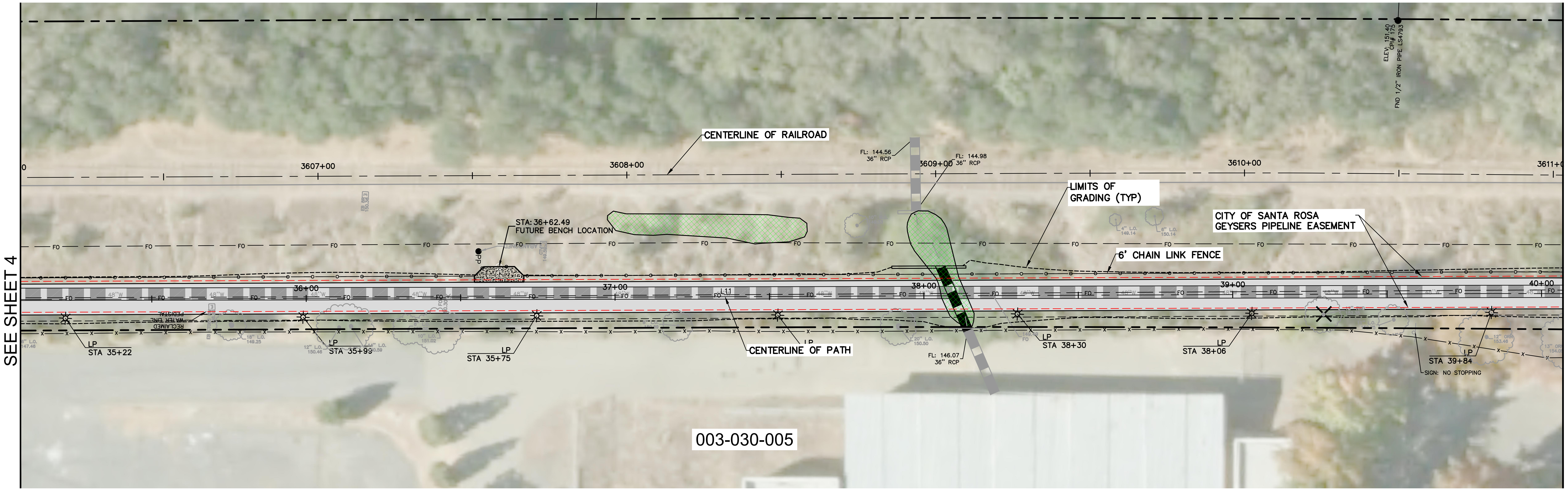
SITE PLAN

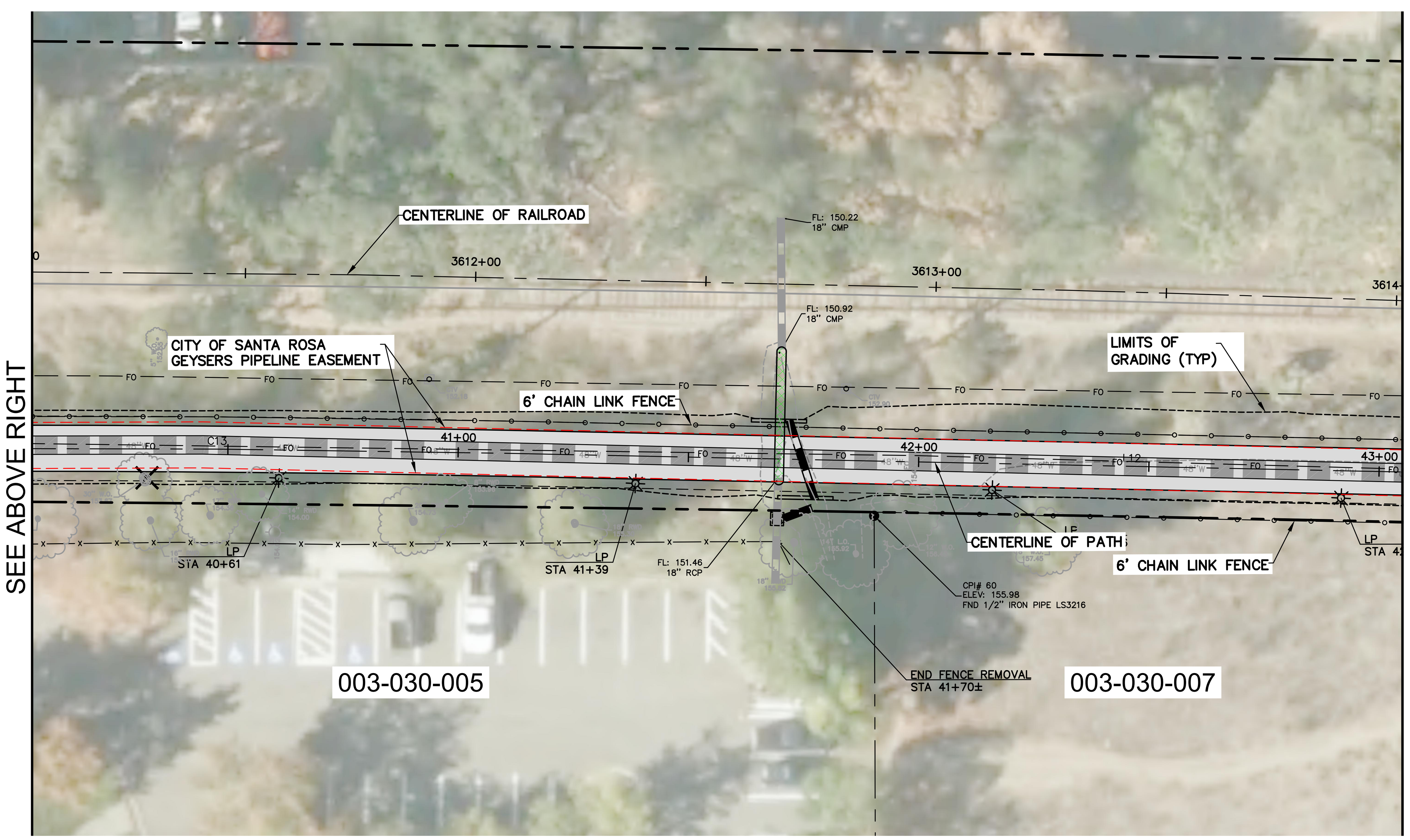
PROJECT NUMBER
09-3642

DRAWING DATE
MARCH 2019

SHEET NUMBER
4 OF 6

HORIZONTAL SCALE: 1"=20'





FOR REDUCED PLANS, THE ORIGINAL SCALE IS IN INCHES

PREPARED UNDER THE DIRECTION OF

DATE

DESIGNED BY	DRAWN BY	REVIEWED BY
JWM	JWM	HEU

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

CITY OF HEALDSBURG
FOSS CREEK PATHWAY - SEGMENTS 7 & 8
CITY OF HEALDSBURG CALIFORNIA

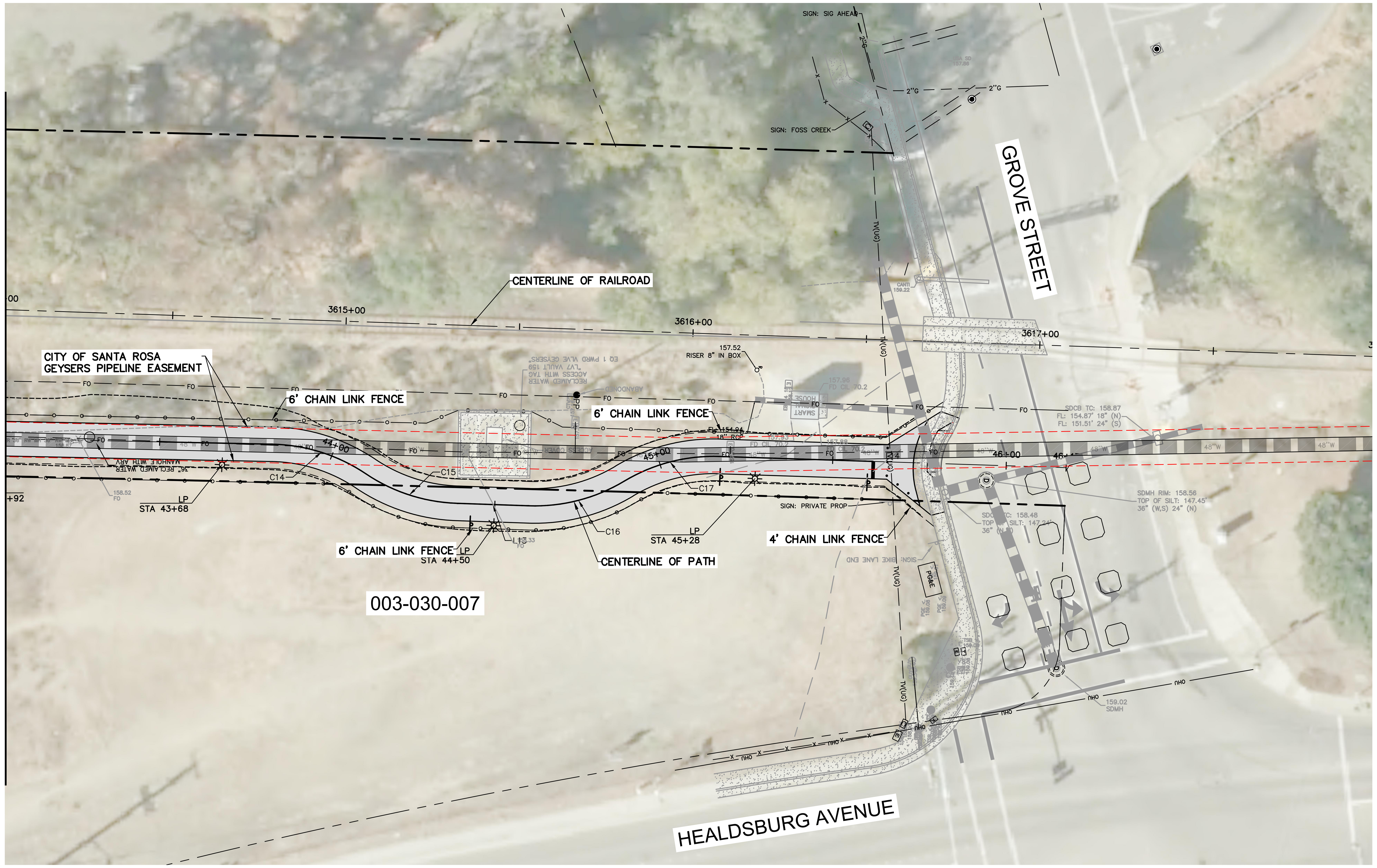
SITE PLAN

PROJECT NUMBER
09-3642

DRAWING DATE
MARCH 2019

SHEET NUMBER
5 OF 6

20 0 20 40
HORIZONTAL SCALE: 1"=20'



FOR REDUCED PLANS, THE ORIGINAL SCALE IS IN INCHES

0 1 2 3

PREPARED UNDER THE DIRECTION OF

DATE

DESIGNED BY JWM | DRAWN BY JWM | REVIEWED BY HEU

Coastland Civil Engineering, Inc.
1400 Neotomas Avenue, Santa Rosa, CA 95405
707.571.8005 707.571.8037 Fax

CITY OF HEALDSBURG
FOSS CREEK PATHWAY - SEGMENTS 7 & 8
CITY OF HEALDSBURG CALIFORNIA

SITE PLAN

PROJECT NUMBER
09-3642

DRAWING DATE
MARCH 2019

SHEET NUMBER
6 OF 6