



VEGETATION AND WILDLIFE ASSESSMENT

SAN MIGUEL VALLEY CORPORATION'S
SOCIETY TURN PARCEL &
PRELIMINARY DEVELOPMENT PLAN

Prepared by

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1.0 Summary of Findings

San Miguel Valley Corporation (SMVC) is proposing multi-use development on a parcel of land within San Miguel County called the “Society Turn” parcel (Parcel). The Parcel is located immediately west of the roundabout at the intersection of State Highway 145 and State Highway 145 Spur and is bisected by the San Miguel River (**Figure 1**). Development plans are limited to preliminary stage at the time of this report but propose 5 separate Planning Areas, encompassing approximately 10.2 acres of the approximately 20 total acres within the Parcel. The remainder of the Parcel acreage would be devoted to road easements and designated Open Space. As a centerpiece of the development, a medical center is proposed for Planning Area 1. Areas of elevated environmental sensitivity and scenic value would be preserved in Park/Open Space areas, primarily along the riparian corridors of the San Miguel River and Remine Creek (**Figure 2**).

The Parcel is bounded on the north and east sides by the State Highway right-of-way (ROW), and on the south side by existing facilities including the Town of Telluride’s existing wastewater treatment plan and San Miguel Power Association’s Telluride Substation. Due to generally flat topography and lack of tree cover, the majority of the Parcel is within sight and sound of these existing facilities and is extensively impacted by anthropogenic factors including artificial light, elevated noise, and the visual presence of human activity.

Currently the Parcel is dominated by heavily-altered pastureland, seasonally irrigated by a lateral ditch from Remine Creek. There is minimal shrub or tree cover on the Parcel outside of the riparian corridors. Habitat value on the Parcel is limited due to the lack of vegetation diversity and native species, the structurally-homogenous herbaceous vegetation cover, and the proximity to extensive areas of adjacent disturbance. Development of the Parcel would have no impact on any USFWS-listed threatened or endangered species, and only minimal impacts to other species of concern such as deer and elk.

Development of the parcel would have no impact on any USFWS-listed threatened or endangered species. General wildlife habitat values on the Parcel are minimal, and primarily associated with ungulate movement patterns between summer and winter habitats on Deep Creek Mesa to the north, and severe winter range and water resources along the San Miguel River immediately south of the Parcel. Nesting, denning, breeding, and production habitat for species of concern is entirely absent from the Parcel, but there is evidence of occasional transit across the Parcel by large mammals. However, the majority of local ungulate movement occurs immediately to the east of the Parcel, in the large areas of open space preserved by the Town of Telluride as the Valley Floor Property. The extensive existing disturbance on and immediately adjacent to the Parcel would discourage ungulate movement on the Parcel when nearby attractive alternative movement corridors are available. Based on personal observations and interviews with the property manager, elk currently traverse the Parcel at dispersed locations throughout the pasture areas. There are no clearly identified corridors on the Parcel that host significant ungulate movement. Although the Remine Creek corridor provides a sheltered transit path between Deep Creek Mesa and the San Miguel River, the Creek gradient is extremely steep and narrow on the Parcel, and has been significantly altered by the construction of Highway 145, where the Creek has been steepened and culverted to pass under the roadway and embankments. Some few animals currently cross the open terrain of the Parcel’s pasture areas to reach the river, but this movement is constrained by the need to cross State Highway 145, and the need to pass through significant anthropogenic disturbances.

Due to the high-density mixed-use envisioned for the Planning Areas of the Parcel, animal movement will be extremely constrained or substantially eliminated in those portions of the Parcel. However, given the extent of development already existing in the immediate proximity, we recommend that development on the Parcel proceed, based on our determination that wildlife value

is already largely absent from the Parcel, and that concentrating this development in an area of existing impact is a preferable site. Consideration has been given to preserving the ability for animals to cross the property to the extent possible: the movement corridors of Remine Creek and the San Miguel River are preserved in the preliminary plans as they exist at the time of this report, due to these areas' inclusion in the Open Space zones.

The movement corridor of Remine Creek is preserved in the preliminary plans as they exist at the time of this report, due to the area's inclusion in the Open Space zones. In addition, the following measures are suggested to achieve this goal while allowing development to proceed (a full list of suggested mitigation measures is provided in **Section 8.0**):

- Cluster development in the impacted/agricultural portions of the Parcel. The existing development plan currently complies with this suggestion, by avoiding disturbance to the corridor of the San Miguel River.
- Constrain all existing and proposed trails to non-motorized uses, to limit disturbance to wildlife from vehicle noise and excessive speeds.
- Remove woven-wire fences wherever they occur on the Parcel, and replace with wildlife-friendly fences per CPW standards that are appropriate for the cattle grazing that currently occurs on the Parcel. As individual planning areas are removed from grazing and converted to development, replace the remaining boundary fences with wildlife-friendly fence designs where necessary, or remove fencing altogether where practical.
- Limit night-time anthropogenic disturbance from lighting by installing low-intensity shielded exterior safety and utility lights.
- Prohibit contractor's dogs on the Parcel during construction. After construction is complete, establish mandatory dog-control policies to prevent barking, free-roaming, and wildlife chasing or harassment by resident or visiting dogs.
- The potential medical center includes a proposal for a helicopter landing pad. Consider establishing minimally-impactful helicopter overflight paths to minimize wildlife flushing risk, as feasible within operational requirements and aviation regulations.
- Standard bear-safety measures for facility design and operation should be applied, due to location within a Black Bear Huan Conflict Area.

2.0 Project Background

2.1 Project Overview

SMVC is proposing a mixed-use development on the Society Turn Parcel and is currently in the preliminary stage of design. The Parcel encompasses 5 Planning Areas, as well as a proposed 1.5 acre expansion to the existing Town wastewater treatment plant, access roads, and two designated open space areas (**Figure 2**). Planning Area 1 is envisioned to encompass a medical center; other Planning Areas have not been detailed beyond the preliminary stage, but development is intended to address identified needs within the Telluride region, including medical services, employee housing, hotel facilities, office space, and retail space. The intention is for mixed-use, high density development to occur in the majority of the Parcel

The full build-out of the Parcel would proceed sequentially, with Planning Area 1 being built first, Planning Areas 2 & 3 to be built in a second phase, and Planning Areas 4 & 5 to be built in a third phase. The existing cattle ranching activities would continue in undeveloped Planning Areas until construction begins, therefore cattle ranching is expected to continue on portions of the Parcel for several years.

2.1.1 Project Setting

The Parcel is located predominantly on the north bank of the San Miguel River, and generally encompasses the river terrace between the channel and the steep south-facing slopes of Deep Creek Mesa. Approximately 500 linear feet of the San Miguel River bisect the property, and approximately 2,200 feet (0.4 miles) of the river are immediately south of the Parcel boundary. The northern and eastern edges of the Parcel are directly adjacent to State Highway 145 and the CDOT ROW. Remine Creek traverses the west end of the property, flowing from its headwaters on Deep Creek Mesa south to confluence with the San Miguel.

The majority of the Parcel is currently pastureland irrigated by a lateral ditch off Remine Creek. This irrigation activity is limited to the summer months, with new ditches and ponds having been constructed subsequent to a 2008 wetland delineation. There is visible evidence of this ongoing use on the property, such as piping, ditch clean-out material, and pond maintenance. The pasture is typical of grazed settings in the region, with drier portions being dominated by upland pasture grasses and heavily irrigated areas have a component of rush and sedge species within the dominant pasture grass community. Small portions of the Parcel immediately adjacent to Remine Creek and the San Miguel River support willow-dominated riparian vegetation (see **Section 3.2**).

2.2 Description of Adjacent Facilities

As previously stated, the Parcel is adjacent to significant existing development. The CDOT ROW for State Highway 145 abuts the property on the north and east sides, and the roadway supports extensive daily traffic, with up to 7500 average annual daily trips (AADT) being reported by CDOT (2019). A traffic study prepared for this proposal provides detailed estimates of anticipated traffic on the Parcel's internal roads, as well as traffic increase on the adjacent public roads (SGM, 2020) The Parcel also borders the Town of Telluride's existing wastewater treatment plan, and San Miguel Power Association's Telluride Substation. Each of these facilities is accessed by separate road easements which cross the Parcel. Sanitary sewer and natural gas transmission easements also traverse the property. In summary, infrastructure impacts and associated anthropogenic disturbance already dominate the immediate vicinity, with the light, noise, and visual modifications associated with existing traffic and roadways being especially prominent.

Figure 1 - Parcel Vicinity Map



LEGEND

- Rivers/Streams
- Roads
- Highways
- Society Turn Parcel
- 3 Mile Property Radius
- CITIES
- BLM
- Private
- USFS

Vicinity Map

San Miguel Valley Corporation

Society Turn Parcel
Wildlife Assessment

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Drawn By: RKK

SCALE: 1" = 1 miles

Figure 2 - Society Turn General Site Plan

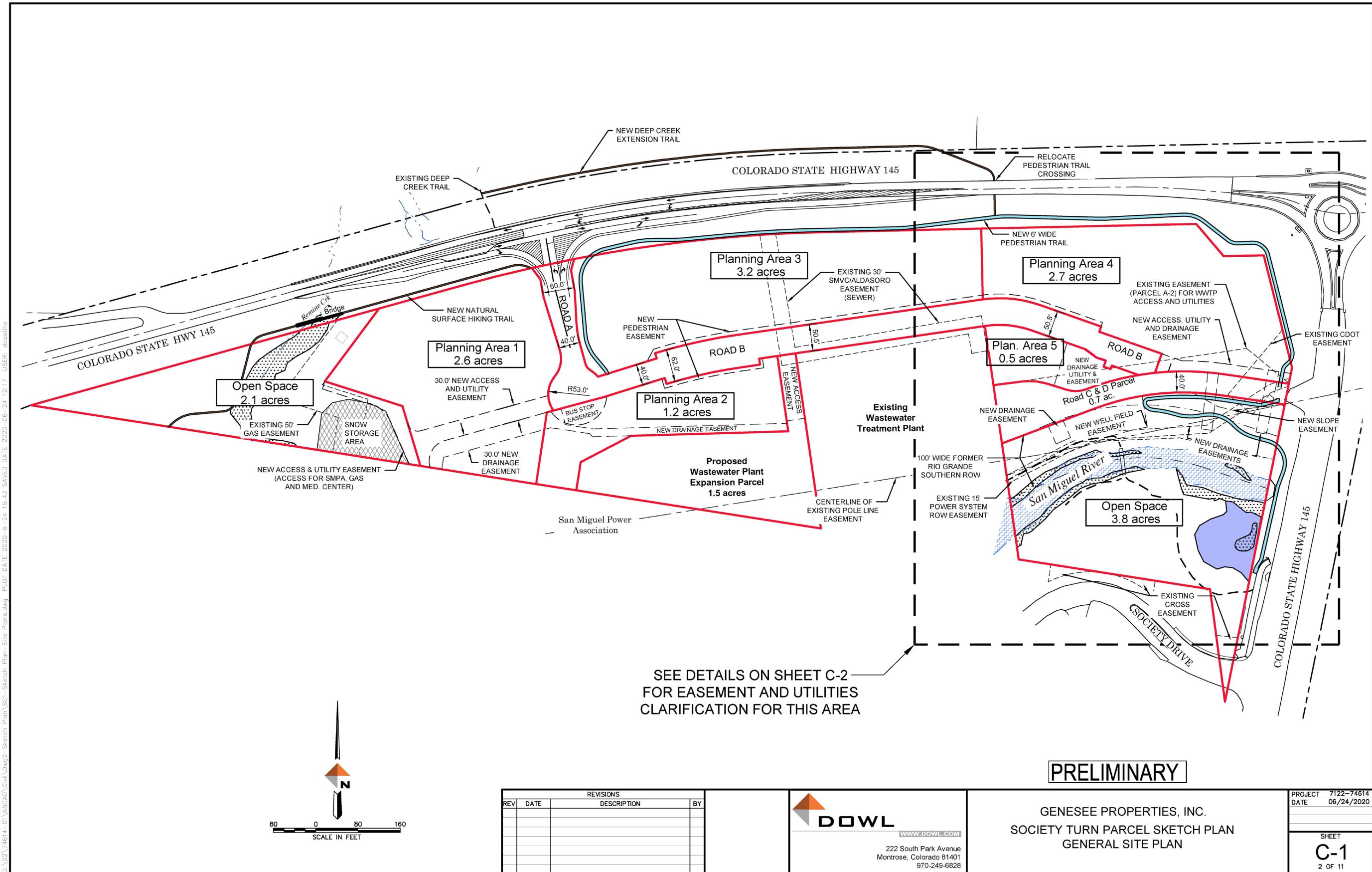


Figure 3 - Society Turn Development Phases

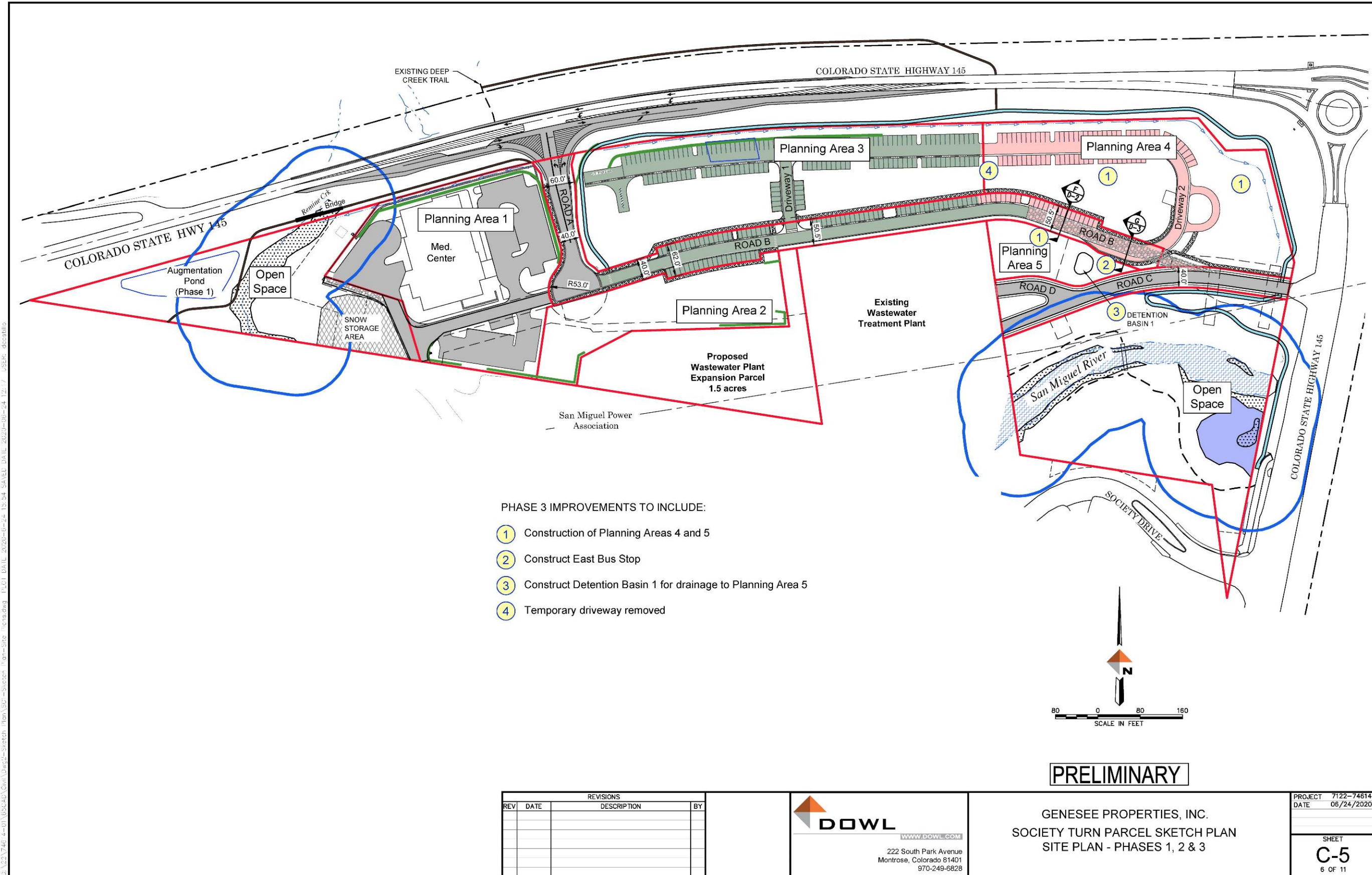
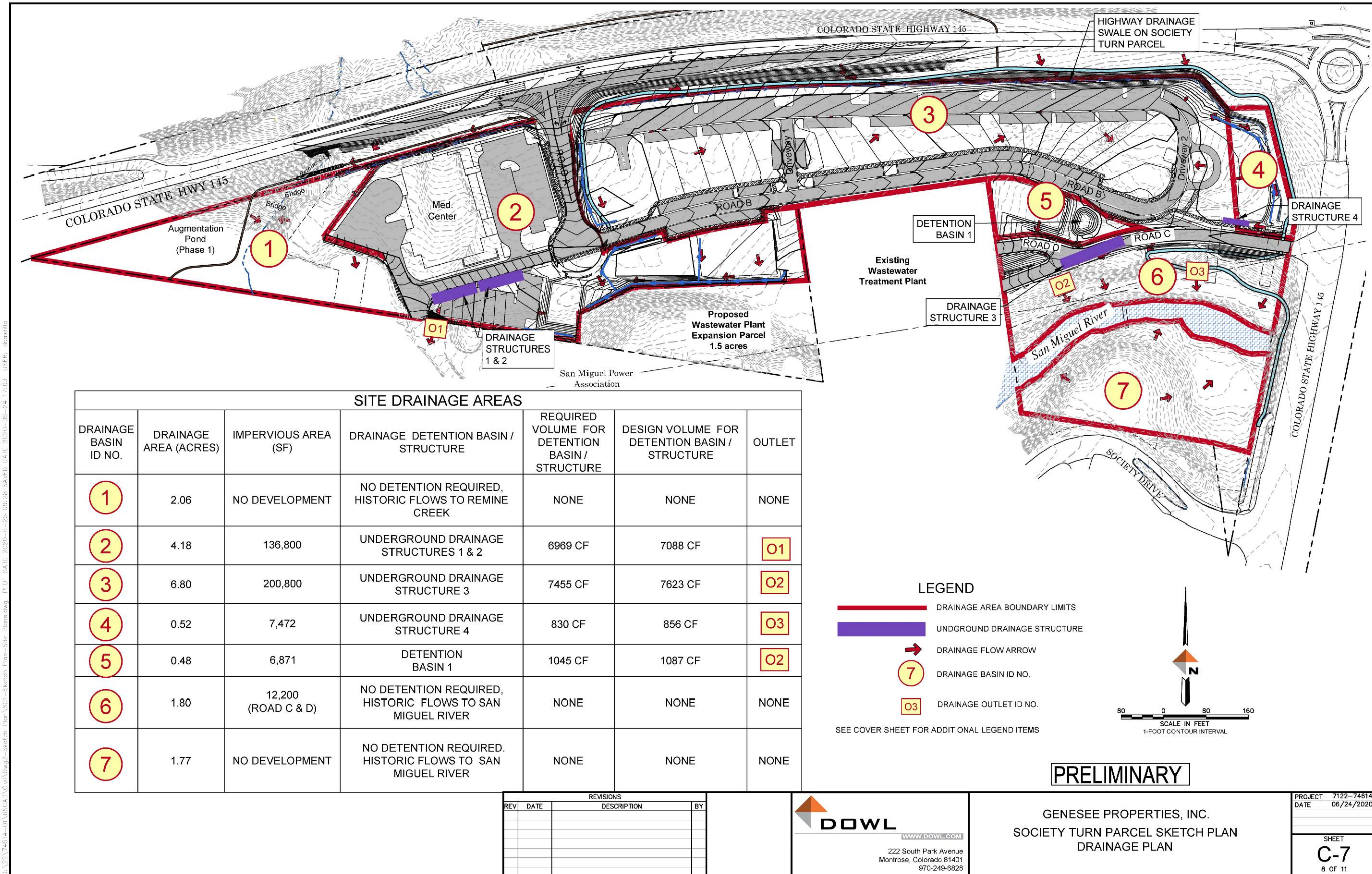


Figure 4 - Society Turn Drainage Plan



SITE DRAINAGE AREAS						
DRAINAGE BASIN ID NO.	DRAINAGE AREA (ACRES)	IMPERVIOUS AREA (SF)	DRAINAGE DETENTION BASIN / STRUCTURE	REQUIRED VOLUME FOR DETENTION BASIN / STRUCTURE	DESIGN VOLUME FOR DETENTION BASIN / STRUCTURE	OUTLET
1	2.06	NO DEVELOPMENT	NO DETENTION REQUIRED, HISTORIC FLOWS TO REMINE CREEK	NONE	NONE	NONE
2	4.18	136,800	UNDERGROUND DRAINAGE STRUCTURES 1 & 2	6969 CF	7088 CF	O1
3	6.80	200,800	UNDERGROUND DRAINAGE STRUCTURE 3	7455 CF	7623 CF	O2
4	0.52	7,472	UNDERGROUND DRAINAGE STRUCTURE 4	830 CF	856 CF	O3
5	0.48	6,871	DETENTION BASIN 1	1045 CF	1087 CF	O2
6	1.80	12,200 (ROAD C & D)	NO DETENTION REQUIRED, HISTORIC FLOWS TO SAN MIGUEL RIVER	NONE	NONE	NONE
7	1.77	NO DEVELOPMENT	NO DETENTION REQUIRED, HISTORIC FLOWS TO SAN MIGUEL RIVER	NONE	NONE	NONE

LEGEND

- DRAINAGE AREA BOUNDARY LIMITS
- UNDERGROUND DRAINAGE STRUCTURE
- ➔ DRAINAGE FLOW ARROW
- 7 DRAINAGE BASIN ID NO.
- O3 DRAINAGE OUTLET ID NO.

SEE COVER SHEET FOR ADDITIONAL LEGEND ITEMS

SCALE IN FEET
1-FOOT CONTOUR INTERVAL

PRELIMINARY

REVISIONS			
REV	DATE	DESCRIPTION	BY

DOWL
www.dowl.com
 222 South Park Avenue
 Montrose, Colorado 81401
 970-249-6828

GENESEE PROPERTIES, INC.
 SOCIETY TURN PARCEL SKETCH PLAN
 DRAINAGE PLAN

PROJECT 7122-74614
 DATE 06/24/2020
 SHEET
C-7
 8 OF 11

3.0 Existing Conditions

SGM completed a site assessment of the Parcel on December 11, 2018 with subsequent visits during the summer of 2019 and summer of 2020 to confirm growing season conditions and to account for adjustments to the planned development. A wetland delineation effort had previously been completed and subsequently updated by Bikis Water Consultants (BWC 2008, 2013, 2017, 2019), and these reports were used to supplement the information gathered in the most recent December visit (especially with regard to herbaceous vegetation and growing-season hydrology). Vegetation conditions as they existed on the Parcel at the time of these inspections are described below. Photo points were established (**Figure 5**) and may be compared with the photolog which is attached to this report (**Appendix B**).

The pasture portion of the property is dominated by agricultural cultivars such as smooth brome (*Bromus inermis*) and Kentucky bluegrass (*Poa pratensis*), with smaller components of hydrophytic graminoids such as rushes (*Juncus* spp.) and sedges (*Carex* spp.). The site historically (pre-settlement) would have supported a more diverse assemblage of native forbs, with a significant shrub component (sagebrush and rabbitbrush [*Artemisia* and *Ericameria* spp.]) and isolated stands of conifers or cottonwoods depending on groundwater availability.

Under current conditions, due to long-term irrigation of the property and resultant elevated ground water, most of the shrubs that were likely once cleared would have a difficult time reestablishing. However, isolated narrowleaf cottonwoods (*Populus angustifolia*) are persistent on the property. Because of the yearly irrigation of the meadows, mixed willows (*Salix* spp.), Baltic rush (*Juncus balticus*), beaked sedge (*Carex utriculata*) and other more wetland obligates have become established in the upland areas. It is unknown whether the cottonwoods have established in areas where groundwater is naturally abundant, or whether shallow subsurface water from the irrigation is supporting the scattered trees. The historical grazing has left most of the pasturage soils fairly compacted, with reduced plant diversity.

The portion of the Parcel immediately adjacent to the San Miguel River and to Remine Creek supports a narrow riparian vegetation fringe along the banks, dominated by blue spruce (*Picea pungens*) and several species of willows (including *Salix monticola* and *Salix exigua*). The herbaceous component of the riparian corridor is more diverse than the upland pasture areas, and supports a range of graminoids and forbs



Typical summer conditions in the irrigated pastures



San Miguel River riparian corridor within the Parcel

adapted to a mesic environment with year-round moisture availability. However, much of the riparian corridor of Remine Creek is so incised that the willows create a closed canopy over the Creek, and herbaceous density is limited. Along the San Miguel River, herbaceous diversity is limited by the legacy of grazing, and by disturbed and degraded soils derived from, or negatively impacted by, historical mining activity.

The riparian habitat within the boundary of the Parcel is limited to approximately 500 linear feet of the San Miguel River at the Parcel's eastern end, and approximately 320 linear feet of Remine Creek at the Parcel's western end. Remine Creek reaches its confluence with the San Miguel River immediately south and downgradient from the Parcel boundary.

The riparian habitat within the Parcel is entirely encompassed by the proposed Open Space zones within the preliminary development plan (**Figure 2**). This design acknowledges the significant value of the riparian corridor as scenery, wildlife habitat, and recreational zone, as well as the difficulty of engineering development on the steep slopes surrounding the riparian zone. The riparian corridor along the San Miguel River already includes the Galloping Goose Connector trail, which introduces significant physical disturbance and anthropogenic activity into this area. The proposed development includes a proposal to extend the trail network and strengthen the existing connection between the Valley Commuter Trail and the recreational trails in the area (**Figures 2 & 3, Section 4.1.4**).

The channels of the San Miguel River and Remine Creek have both been extensively modified by human activity where they occur within the Parcel. It is likely that historical mining activity has altered the channel morphology of the San Miguel River by excavation of native material and discharge of tailings. There is some inconclusive evidence of mine tailings in the small portion of the property south of the San Miguel, adjacent to the river (included in the proposed Open Space). The channel of Remine Creek has been steepened by the construction of the HWY 145 roadbed and embankment, which increases the local grade of the channel and has likely contributed to the current deeply-incised nature of the channel.

The perimeter of that portion of the property that is grazed (Planning Areas 1-5 and the proposed Wastewater Plant Expansion) are fenced with four-strand barbed wire livestock fencing. Portions of the Open Space surrounding the San Miguel River have discontinuous segments of woven-wire sheep fencing topped with single-strand barbed wire, and also some areas of decrepit four-strand fencing.

In summary, the vegetation currently provides grazing habitat for wildlife, but limited habitat value due to a lack of topographical or structural diversity, regular re-occurrence of elevated ground water due to irrigation, and a low incidence of woody plant species to provide nesting material, roosting areas, or other specialized habitat needs.

3.1 Hydrology

The only significant hydrologic features on the Parcel are the San Miguel River and Remine Creek. The San Miguel is the primary drainage for the surrounding vicinity, and is a perennial stream draining the entirety of the Telluride canyon. At the point where it passes through the Parcel, the River's catchment is approximately 133 square kilometers. There is minimal impoundment or flow control on the headwaters reach of the San Miguel River, therefore the yearly hydrograph is typical of a natural snowmelt-dominated feature, with a pronounced peak flow occurring in early summer, with a rapid decrease throughout the summer to base-level flow conditions which persist into winter and spring.

Remine Creek is a perennial water feature that drains a catchment of approximately 7 square kilometers, including portions of Deep Creek Mesa and the southern flanks of Campbell Peak on

the Dallas Divide. The portion that occurs on the Parcel is an extremely steep gradient upper perennial stream with poorly developed morphology and minimal evidence of sediment sorting. Although it is perennial, the morphology suggests that flows are extremely “flashy,” peaking quickly during precipitation events and dropping rapidly afterwards. The channel morphology also appears to be artificially steepened by the presence of the Highway 145 road embankment immediately upstream of the Parcel.

Figure 5 - Photo Point Map



LEGEND

- Photo Points
- Rivers/Streams
- Roads
- Highways
- Society Turn Parcel

Detail Map

San Miguel Valley Corporation

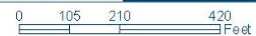
Society Turn Parcel
Wildlife Assessment

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SCALE: 1" = 0 miles

4.0 Proposed Development

4.1 Structural and Architectural

Structural and design details of the proposed development are not available at this time, although SMVC envisions mixed-use buildout for the majority of the site, including a medical center, employee housing, hotel facilities, office space, and retail space. The intention is for mixed-use, high density development to occur in the majority of the Planning Areas, and conceptual parking layouts are shown in **Figure 3**, along with the conceptual building footprint of the medical center. Residential development is included in the proposal, therefore the expectation is that human occupancy and associated impacts from traffic, light, and noise would be present continuously, and would not be limited just to extended business hours.

4.1.1 Medical Center

Planning Area 1, which includes 2.6 acres, would be the site of a new regional medical center and associated parking lots (**Figure 3**). This facility would replace the existing Medical Center in the Town of Telluride and would allow the Telluride Hospital District to better serve the community by providing more space, more advanced medical facilities, and the ability to accommodate helicopter flights for critical patients.

The medical center is proposed as a two- or three-story building, accessed from Highway 145 via Road A. The building would be surrounded with paved parking areas. A medical helipad would be included, either located on the roof or at ground level adjacent to the building, and a pedestrian path would extend along the north edge of the medical center and Planning Area 1, cross Remine Creek via elevated walkway, and would provide public access to the 2.1-acre open space area in the extreme western end of the Parcel. This open space would be maintained for the benefit of patients and visitors to the Medical Center but would also be open to public use, with trail connections to the existing Galloping Goose trail.

Patients would arrive to the medical center by vehicle or be transported to the medical center by ambulance, arriving via Highway 145 on the north boundary of the Parcel. The medical center would be in operation on a 24-hour basis, and the associated anthropogenic disturbances such as traffic, lighting, and human activity could also be present on a 24-hour basis.

4.1.2 Medical Helipad

A helipad would be constructed, either on the roof of the medical center or at ground level adjacent, to accommodate flights for critical patients on an as-needed basis. Patients would arrive at the medical center exclusively by ambulance. However, the helipad would enable transport of patients from the medical center to larger facilities in Grand Junction, Montrose, or Durango on an emergency basis.

The helicopter would arrive from a variety of potential origins, depending on local availability. The most likely point of origin would be Montrose, but arrivals from Durango or Grand Junction are also possible. In general, when a determination of medical necessity is made by medical staff, the helicopter would travel to the medical center (most likely over Dallas Divide), and then up the San Miguel River corridor. The helicopter would overshoot the medical center, then turn and land on the helipad facing downcanyon. After receiving the patient, the helicopter would leave traveling back down the river corridor and then to the final destination. The helicopter would not fly in adverse weather conditions, as a safety measure. The helicopter operations are guided and constrained by Federal Aviation Administration regulations, which supersede the recommendations of this report.

Currently, the existing medical center in Town of Telluride provides helicopter life flights several times per year. The existing medical center does not have helipad facilities, therefore the helicopter lands at the Shell gas station west of town, located at 1982 State Highway 145 Spur. This location has several disadvantages over the dedicated helipad proposed here; it does not include a hardened landing surface or safety lighting, it is located immediately adjacent to the paved roadway, and it is immediately adjacent to the protected open space of the Valley Floor Property.

Based on the three previous years of operations, the Telluride Hospital District estimates that helicopter transport would be necessary approximately 10 times per year. Impacts would be minimized by maintaining flight paths away from the Town of Telluride or Mountain Village and over the San Miguel River corridor, and by installing helipad safety/guidance lighting that is under the control of the pilot and illuminated on an as-needed basis. In addition, this facility would remove the existing occasional helicopter use from the Shell station to a more appropriate and less impactful location.

4.1.3 Lighting

It is assumed that some measure of utility lighting would be installed throughout the development, including the medical center and associated parking facilities, to meet safe lighting practices. Final lighting design specifications would determine the extent of impact on nighttime conditions on the property.

The use of outdoor lighting is necessary for adequate safety and function of facilities, but there are several measures that can minimize the negative impacts of outdoor lighting to wildlife. These include the minimization of glare and excessive brightness through the use of low-pressure sodium lights or shielding of the light source, and by preferentially selecting outdoor lightbulbs that use a light temperature of 3000 Kelvin or lower. Generally speaking, outdoor lighting is disruptive to wildlife, and the level of disruption increases with the level of light. Bats and migrating birds are among the wildlife groups most likely to be affected.

4.1.4 Trail Network

Currently the Valley Commuter Trail provides access for pedestrians and cyclists between the Town of Telluride and the Society Turn Parcel via a paved-surface trail paralleling the Highway 145 Spur. The Valley Commuter Trail crosses underneath Highway 145 via tunnel, and ends at the intersection of Society Drive and Highway 145, at the southwestern corner of the Parcel. The Valley Commuter Trail connects to the larger regional network of unpaved trails downvalley via a network of dirt singletrack that provide connections to the Galloping Goose Trail and the Remine Creek Trail. Currently these connections traverse the middle of the Open Space area surrounding the San Miguel River, and also pass through Planning Area 4.

The proposed development includes a proposal to modify and expand the existing trail network to improve connectivity and separation of uses. The trail access from the Valley Commuter Trail to the Remine Creek Trail would be shifted to the west shoulder of Highway 145, located on the road embankment and using the highway bridge over the San Miguel River. The trail would cross the existing Wastewater treatment plant access road, and would then travel around the perimeter of the Parcel, primarily within the CDOT ROW, until reaching the existing crossing to access the Remine Creek Trail on the north side of the Parcel (**Figure 3**). This trail construction would separate trail users from the traffic and business use on the Parcel. It would also provide separated trail access to Remine Creek Trail versus the Galloping Goose Connector Trail. At this time recreationalists from both trails need to use the singletrack trail and narrow bridge across the Open Space area. The bridge and trail are too narrow to accommodate significant two-way traffic. The revised trail layout

would concentrate two-way traffic on the Valley Commuter Trail, which is wide enough to accommodate the use.

In addition to the proposed reroute of access to the Remine Creek Trail, a new trail would be constructed from Planning Area 1 and the Medical Center into the Open Space area at the western end of the Parcel (**Figure 3**). This trail would provide public access to the Open Space area, including the potential for extension and connection south to the Galloping Goose Trail. This would allow local residents, visitors, and hospital guests to complete a short walking loop around the perimeter of the Parcel. The proposed trail would span the incised channel of Remine Creek, avoiding any direct impact to the wetland/riparian habitat within the channel.

The proposed trail developments do not have the potential to significantly alter existing wildlife habitat conditions. The addition of a trail crossing Remine Creek and accessing the west bank of the Creek would slightly expand the area impacted by anthropogenic trail use, but as previously stated the area in question is so close to Highway 145 that it is significantly impacted already, and has minimal wildlife habitat value. Direct impacts to the Remine Creek channel and riparian corridor would be avoided by an elevated crossing.

4.1.5 Fencing

In general, fencing would be maintained around Planning Areas 2 through 5 as long as grazing activity continues. The discontinuous decrepit fencing south of Planning Area 5 in the vicinity of the San Miguel River should be removed entirely. These fences present an entrapment and injury risk to wildlife (CPW 2009). For the fencing that will remain, wildlife-friendly fencing options are recommended if and when repairs or replacements are needed, specifically the incorporation of smooth wire for the top and bottom. Wire fencing can also be designed to allow safe passage for wildlife under or over the fence by incorporating mitigation features such as high-tensile installation, smooth bottom wire, or high-vis flagging on top wires. Much of the existing perimeter fencing was modified in the summer of 2019 to improve wildlife safety, including re-tensioning the lines and replacing the top strand with smooth wire. Both measures make it easier for elk to cross the fence without injury or entanglement.

The medical center in Planning Area 1 does not include fencing proposals, therefore existing fencing would be removed once development commences.

4.1.6 Drainage

The preliminary drainage plan for the development is provided in **Figure 4**. A mixed-use development of the density proposed entails extensive areas of hardscape (asphalt, concrete, roofs or other artificial surfaces) to accommodate building footprints and parking, and the area of ground surface available for infiltration is limited. Therefore, engineered stormwater collection, treatment and discharge facilities have been developed. In general, stormwater collected on developed portions of the Parcel would be channeled to underground detention structures, then discharged to the San Miguel River via one of three drainage outlets. There would be no discharge from the site into wetland areas.

4.2 Traffic

CDOT's traffic data indicate that State Highway 145 currently supports up to 7500 trips per day. Highway 145 is immediately adjacent to the north and east boundaries of the Parcel. This level of traffic generates significant associated disturbances such as noise, exhaust, and light, and the impact of these disturbances likely extends throughout the Parcel at this time. A traffic study prepared for this project has determined that the proposed development on the Parcel will increase

traffic on Highway 145, but that the Highway will continue to operate at an acceptable Level of Service when considering the growth in background traffic over the 20-year planning horizon. Auxiliary turn lanes are recommended for the access road (SGM, 2020). It is unlikely that traffic associated with the proposed development would create substantially novel impacts within the Parcel, given the extensive traffic that already exists immediately adjacent on the State Highway. Currently, traffic is generally limited to the perimeter of the Parcel on Highway 145, with only occasional use on the existing interior roads for the power station, wastewater plant, and ranching pastures. There would be new roads within the Parcel under the eventual development conditions (**Figure 3**) and a substantially increased volume of traffic would traverse the interior of the Parcel. However, under current conditions the entire Parcel is already exposed to traffic impacts, therefore the effective change is likely to be minimal.

5.0 Wildlife Use of Area and Impacts of Development

Information on species status, distribution, and ecology was derived from U.S. Fish & Wildlife Service (USFWS) recovery plans, Colorado Natural Heritage Program maps and reports, Colorado Parks and Wildlife (CPW) habitat mapping, geographic information system (GIS) databases, various scientific studies and reports, and field reviews. The wildlife species inventory and assessments have been mapped and described following all applicable practices of the CPW.

Listed or candidate wildlife species that were considered and evaluated for this assessment include those identified by the USFWS as potentially occurring in the project area. While all listed species were initially considered, species where there would be **No effect** from the project were eliminated from further consideration. The decision to eliminate a species from consideration was based on known range distributions being outside of the project area and/or complete habitat incompatibility.

5.1 Federally-Listed Species

The following federally-listed species are identified by USFWS as potentially occurring within the Project's immediate vicinity.

5.1.1 Colorado River Fish

Status: FWS Endangered

Four species of fish endemic to the Colorado River system (Colorado pikeminnow [*Ptychocheilus lucius*], razorback sucker [*Xyrauchen texanus*], bonytail [*G. elegans*], and humpback chub [*Gila cypha*]) are listed as endangered with critical habitats designated in the Dolores River and Colorado rivers within 5th level watersheds. The San Miguel River is tributary to, and approximately 110 miles upstream from, occupied habitats and designated critical habitats.

The Colorado pikeminnow was included on the 1967 list of native fish and wildlife threatened with extinction under the Endangered Species Preservation Act of 1966 and included in Appendix D, the "United States List of Endangered Native Fish and Wildlife" prior to enactment of the ESA of 1973. A naturally reproducing population of Colorado pikeminnow inhabits the Colorado River near the confluence with the Dolores River. The USFWS (1994) designated critical habitat in the Colorado River and its 100-year floodplain from approximately the Town of Rifle in Garfield County downstream through Utah, to Lake Powell in Utah.

The razorback sucker was listed as endangered by the USFWS in 1991 because of limited numbers found throughout the Colorado River Basin and minimal evidence of natural recruitment (USFWS 1991). Within the Upper Colorado River Basin, naturally reproducing populations are only found in the middle Green River in Utah and in an off-channel pond in the Colorado River near Grand Junction (USFWS 2002b). Most razorback suckers in the Colorado River have occurred in the Grand Valley near Grand Junction, although the number of fish captured in Grand Valley has declined dramatically since 1974. The USFWS (1994) designated the same critical habitat for razorback suckers in the Colorado River Basin as for Colorado pikeminnows.

The bonytail is an exceedingly rare minnow originally native to the Colorado River system of the western United States and northern Mexico (USFWS, 2002c). The bonytail was listed as endangered by the USFWS in 1980 because it had been nearly extirpated from its historical range (USFWS 1980). The USFWS designated critical habitat for the bonytail in river channels and flooded, ponded, or inundated riverine habitats that would be suitable for adults and young (USFWS 1994). There is no critical habitat for bonytails in the Dolores River or its 100-year floodplain, but critical habitat occurs in the Colorado River in Garfield and San Juan counties, Utah.

The humpback chub was included on the 1967 list of native fish and wildlife threatened with extinction under the Endangered Species Preservation Act of 1966 (USFWS 1967) and included in Appendix D, the “United States List of Endangered Native Fish and Wildlife” (USFWS 1970) prior to enactment of the ESA of 1973. The distribution of humpback chub in 1990 included the Colorado River mainstem reaches in the vicinity of Westwater Canyon, Utah and Black Rocks, Colorado (USFWS 1990a). Humpback chubs occasionally are collected outside of documented population centers and the lower Gunnison River (Valdez et al. 2011). The USFWS designated critical habitat for the humpback chub in river channels and flooded, ponded, or inundated riverine habitats that would be suitable for adults and young (USFWS 1994). There is no critical habitat for humpback chubs in the Dolores River or its 100-year floodplain, but critical habitat occurs in the Colorado River in Utah.

Effects Analysis. No habitat exists within or adjacent to the Society Turn Parcel area for the Colorado pikeminnow, razorback sucker, bonytail or humpback chub; therefore, no direct impacts would result from this project.

We assume that site stormwater would be collected and treated appropriately, per the drainage plan (**Figure 4**), and that any hazardous materials would be stored in appropriate containment per San Miguel County building code standards. Therefore, development of the Parcel is not expected to increase the risk or release any potential contaminated materials on the site and is not anticipated to increase the likelihood of future contamination of downstream waters. As the project area is quite some distance from the endangered fish habitats, accidental spills from construction vehicles traveling to, or on the Parcel would be diluted to an extent sufficient to protect the endangered fishes.

Potential construction water needs would be associated with dust suppression, compaction, and decontamination; these waters are assumed to come from municipal sources, and no additional depletions would be anticipated as a component of construction. The proposed augmentation pond located in the western Open Space area (**Figure 3**) would generate a small depletion within the San Miguel watershed, due to evaporative losses. The 1999 Programmatic BO (USFWS 1999) concludes that implementation of the specified elements of the Recovery Action Plan, along with existing and a specified amount of new depletions, are not likely to jeopardize the continued existence of the endangered fish or adversely modify their critical habitat in the Colorado River sub-basin within Colorado. The anticipated depletion amount arising from the augmentation pond would qualify as a minor depletion and has no potential to adversely affect habitat for the listed fish.

Development of the Parcel will have no direct effect on the Colorado Pikeminnow, razorback sucker, humpback chub and bonytail chub. Water quality impacts during construction are not anticipated to impact these species, and post development site runoff would be managed through centralized stormwater detention basins; contaminants reaching the San Miguel River are not anticipated to result in negative impacts to potentially occupied habitats on the Colorado River, which is over 100 river miles downstream of the project area. Minor water depletions such as those proposed with development were anticipated under the 1999 Programmatic BO (USFWS 1999, USFWS 2000b), and guidance has been issued for the authorization and handling of water depletions.

5.1.2 Canada Lynx

Canada lynx (*Lynx canadensis*) in the contiguous United States were listed as threatened effective April 23, 2000 (USFWS 2000b) and was updated in 2003 (USFWS 2003a) to include Colorado, Idaho, Maine, Michigan, Minnesota, Montana, New Hampshire, New York, Oregon, Utah, Vermont, Washington, Wisconsin, and Wyoming. Lynx introduced to Colorado from Canada and Alaska are included in the 2000 and 2003 final rules. The USFWS (2000b) identified one distinct lynx

population segment in the lower 48 states composed of four distinct regions separated from each other by ecological barriers consisting of unsuitable lynx habitat. With the exception of the Southern Rocky Mountain Region, lynx regions in the United States are geographically connected to the much larger lynx population in Canada.

Lynx Habitat Canada lynx occupy boreal, sub-boreal, and western montane forests (Ruediger et al. 2000) and in mesic coniferous forests that have cold, snowy winters and provide a prey base of snowshoe hare (*Lepus americanus*) (Ruggiero et al. 1999). In the western United States, they are associated with subalpine fir, Engelmann spruce, and also mesic lodgepole pine (*Pinus contorta*) and aspen cover types when mixed with subalpine fir habitat types. Primary Suitable Canada lynx habitat in Colorado is found roughly between 10,000 feet and 12,000 feet elevation (Ruediger et al. 2000). Lower montane forests are likely important for movement and dispersal.

As a forest interior species, lynx generally confine their movements to forested or densely wooded habitats, rarely venturing far from cover, which provides not only foraging opportunities but also concealment from potential predators (including coyotes [*Canis latrans*] and mountain lions [*Felis concolor*]) (Ruggiero et al. 2000; Ruediger et al. 2000; Squires and Laurion 2000; Interagency Lynx Biology Team - ILBT 2013). Suitable travel habitat may be defined as vegetation greater than 6 feet in height that supports a closed canopy. This definition could include densely regenerating aspen, riparian corridors and tall willow stands, as well as conifer forests. For optimum habitat effectiveness, travel habitats should connect foraging, denning, and security habitats within an animal's home range.

Throughout North America, lynx tend not to cross broad openings in order to effectively and efficiently utilize their environment. These openings include broad mountain shrub habitats, mountain valleys, and rugged alpine zones. These movements through unforested habitats are likely necessary for lynx to access forest interiors that provide optimal lynx habitat, particularly with respect to prey availability, hunting strategy, predator avoidance, and optimization of other life-history requisites. How, and to what extent, lynx cross fragmented habitat is related to their status, their gender, whether they are residents, transients, dispersing, or recently released (Mowat et al. 2000).

Effects Analysis. The Parcel does not support suitable lynx habitat. The Parcel is located in proximity to areas that have the structural characteristics of lynx habitat (especially the north-facing slope below Mountain Village), but these areas are fragmented and surrounded by anthropogenic disturbance, reducing their effectiveness to near zero. The Parcel is not located in proximity to, or in between, any larger blocks of suitable habitat, and the likelihood that a lynx would incidentally cross or be near the Parcel is so low as to be discountable. Development of the property would have no impacts on lynx or lynx habitats.

5.2 State-Listed Species

Colorado Parks and Wildlife's (CPW's) list of Threatened and Endangered species and Species of Greatest Conservation Need (SGCN; Tier 1 species only) was reviewed to determine if any species had potential habitat on or adjacent to the study area. While all listed species were initially considered, an elimination of unlikely species from further consideration is indicated in **Appendix C** below. This decision is based on known range distributions being outside of the project area and complete habitat incompatibility. Canada lynx and the Colorado River endangered fish species have already been addressed under **Section 5.1 Federally Listed Species** and are not further considered in this section.

5.2.1 Bald Eagle

Bald eagle (*Haliaeetus leucocephalus*) are federally-protected by the Bald and Golden Eagle Protection Act of 1940. They are also protected under the Migratory Bird Treaty Act of 1918. In addition, CPW tracks bald eagle populations, nesting sites, roosting habitat, and foraging areas and has developed protective stipulations for the species, with specific recommendations for nests, winter night roosts, and hunting perches.

As currently mapped, bald eagle winter range extends up the valley bottom of the San Miguel River approximately to the junction of Highway 145 and Highway 145 Spur and encompasses the entire Parcel area (**Figure 5**). No other bald eagle seasonal ranges occur in proximity to the Parcel. No nests are currently located within or adjacent to the Parcel, and there is minimal habitat of the type preferred by nesting eagles (large deciduous tree adjacent to flowing water). No perch sites were apparent during the field visit, but eagles could be attracted to the foraging habitat along the River and perch in the riparian corridor during the winter.

The protections applied to the riparian zone in the preliminary development plan are likely sufficient to preserve the limited area of eagle foraging habitat that is within the Parcel, and no additional measures are suggested.

5.2.2 Gunnison's Prairie Dog

The Gunnison's prairie dog (*Cynomys gunnisoni*) occupies a variety of grasslands and shrub-steppe of intermountain valleys in the southern Rocky Mountains of northern Arizona, southwestern and southcentral Colorado, northwestern New Mexico, and southeastern Utah. They hibernate during the winter months when food resources are limited and can also aestivate during the summer when stressed due to food or weather issues. Their population number dropped dramatically in the 2000s due to sylvilagic plague.

The nearest colony is approximately 1-mile up-valley from the property (**Figure 5**) and covers approximately 23-acres (ERO 2009). There are no known occupied burrows on the Parcel at this time. Seasonal soil saturation would likely preclude the colonization of any irrigated portions of the Parcel. The un-irrigated pasture areas on the Parcel could potentially support colony development.

The Town of Telluride's Management Plan for the nearby colony (ERO 2009) emphasizes the containment of the colony to its existing boundaries and minimization of dispersal.

Effects Analysis. As the property and nearby areas are not occupied at this time, there would be no direct or indirect impacts to prairie dogs. Development of the Parcel would remove a small area of potential habitat for this species to expand their range into this area, which would be in accordance with the Town of Telluride's containment policy for the existing colony.

5.2.3 River Otter

The river corridor of the San Miguel River is mapped as habitat for the river otter by CPW (**Figure 5**). Northern river otter inhabits riparian habitats that may occur from low elevation deserts to high valleys of Colorado. Otters require permanent water of relatively high quality with an abundance of fish and/or crustaceans (crayfish). Otters also usually are found in streams with high flows (minimum of 10 cfs). During the winter months, otters also need streams with relatively high amounts of open, ice-free water, deep pools, and good access to the shoreline. Historically and currently in Colorado, otters are mostly commonly found in larger rivers at low or moderate elevations. Otters are also known to have colonized larger ponds, lakes and flooded gravel pits.

Fish are the primary food source for otters, particularly slow-swimming fish species. In streams where they are abundant, crayfish can make up a significant portion of otter's diet. Most research

indicates that abundant prey is needed to support otter use of an area (Mack 1985, Malville 1990, Melquist et al. 1981).

Because of the river otter's aquatic life, many aspects of the species' behavior and ecology are not well understood. They are active year-round, and do not hibernate. Otters in the upper Dolores River drainage are mostly diurnal in winter and more nocturnal in summer, with the least activity in late summer and early fall. River otters are social, forming family groups led by the adult female, who may exhibit territorial behavior. Yearling otters, unrelated juveniles, and occasional adult otters may join with family groups.

River otters use both terrestrial resting sites and dens when not actively moving. Beaver bank dens are particularly favored sites. Along the Dolores River, they accounted for most of the denning sites used (Boyle pers. comm. 2008).

Adult otters apparently have few natural predators, although individuals have been killed by bobcats, dogs, coyotes, and foxes (Fitzgerald et al. 1994). Most mortality is thought to occur from trapping and road kills. Habitat destruction and water pollution have an impact as well. The river otter once occurred in most of the major river drainages in Colorado and was extirpated. Starting in 1976, Colorado started reintroduction efforts in several drainages, with an initial goal of establishing two populations. In 1998 a more intensive reintroduction program was started by CPW.

This section of the San Miguel River is mostly iced-over during the winter months, therefore river otter activity in this area would be more likely in the summer months. While otters may occur in the area during the summer, the smaller size of the river in this area likely limits the amount of potential prey. Therefore, otter use of this stretch of the San Miguel is likely to be seasonal and inconsistent. While approximately 500 feet of the Parcel is immediately adjacent to the river, the development is set back from the river and is separated from the river by existing developments (including the water treatment plant, electrical substation, and the existing Galloping Goose Connector trail). River otters are known to utilize the San Miguel River downstream of Sawpit, and the lower section of Dolores River downstream from the confluence with the San Miguel River.

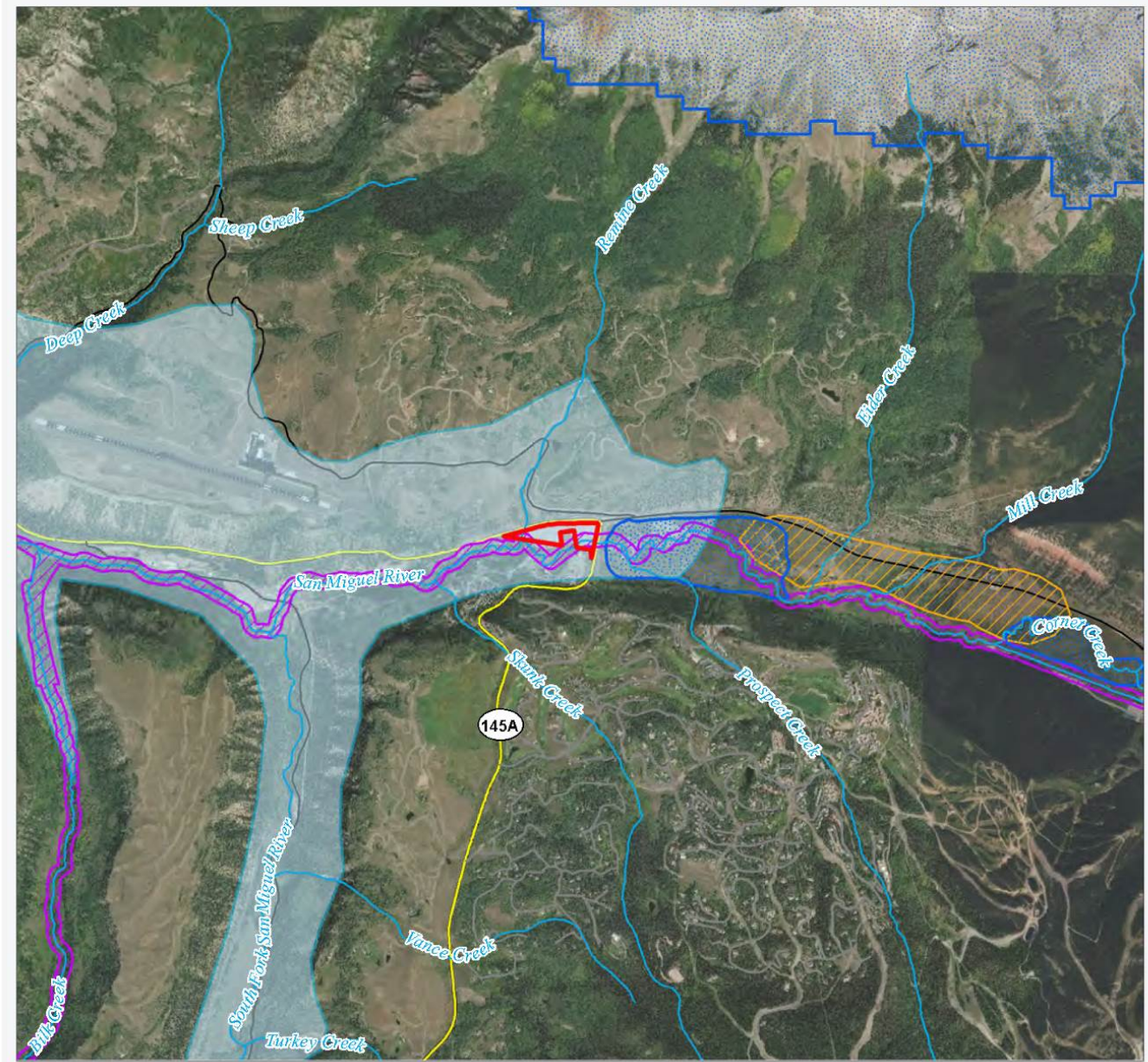
Effects Analysis. Males dispersing from downstream occupied habitat could reach the stretch of river within and adjacent to the Parcel under summer conditions, but they would likely seek deeper and larger streams. As most of the property is set back and separated from the San Miguel River, and as the project will use constructed stormwater management basins/structures to control discharge to the River, there is little potential for impacts to river otters or their habitat.

5.2.4 White-Tailed Ptarmigan

CPW maps a small area of habitat for white-tailed ptarmigan immediately to the east of the Parcel, in the Valley Floor Property owned by the Town of Telluride (**Figure 5**). However, ptarmigan are generally considered to live year-round on or near alpine tundra, above treeline. Ptarmigan are adapted for continuous and relatively deep snowpack conditions in the winter. The mapped habitat and the Parcel are located at an elevation of 8700 feet, approximately 3000 vertical feet below treeline in the San Miguel Valley and is too low to sustain the consistent snowpack typical of the bird's habitat. Ptarmigan are known to seek refuge below treeline in particularly severe conditions but do not typically descend significantly below the treeline. In addition, the structural characteristics of the Valley floor, with scattered woody vegetation, wetland areas, and tall herbaceous vegetation, are not consistent with ptarmigan's preference for open tundra habitat.

Effects Analysis. Observed habitat conditions on the valley floor, both within and adjacent to the Parcel, are incompatible with the habitat requirements of ptarmigan. The Parcel is beyond the currently mapped range of the species as determined by the USFWS. The development of the Parcel would have no effect on ptarmigan or their habitat.

Figure 6 - Additional Wildlife Habitats



LEGEND

- Rivers/Streams
- Roads
- Highways
- Society Turn Parcel
- White-Tailed Ptarmigan Overall Range
- River Otter Overall Range
- Gunnison Prairie Dog Overall Range
- Bald Eagle Winter Range

Additional Wildlife Habitat

San Miguel Valley Corporation

Society Turn Parcel
Wildlife Assessment

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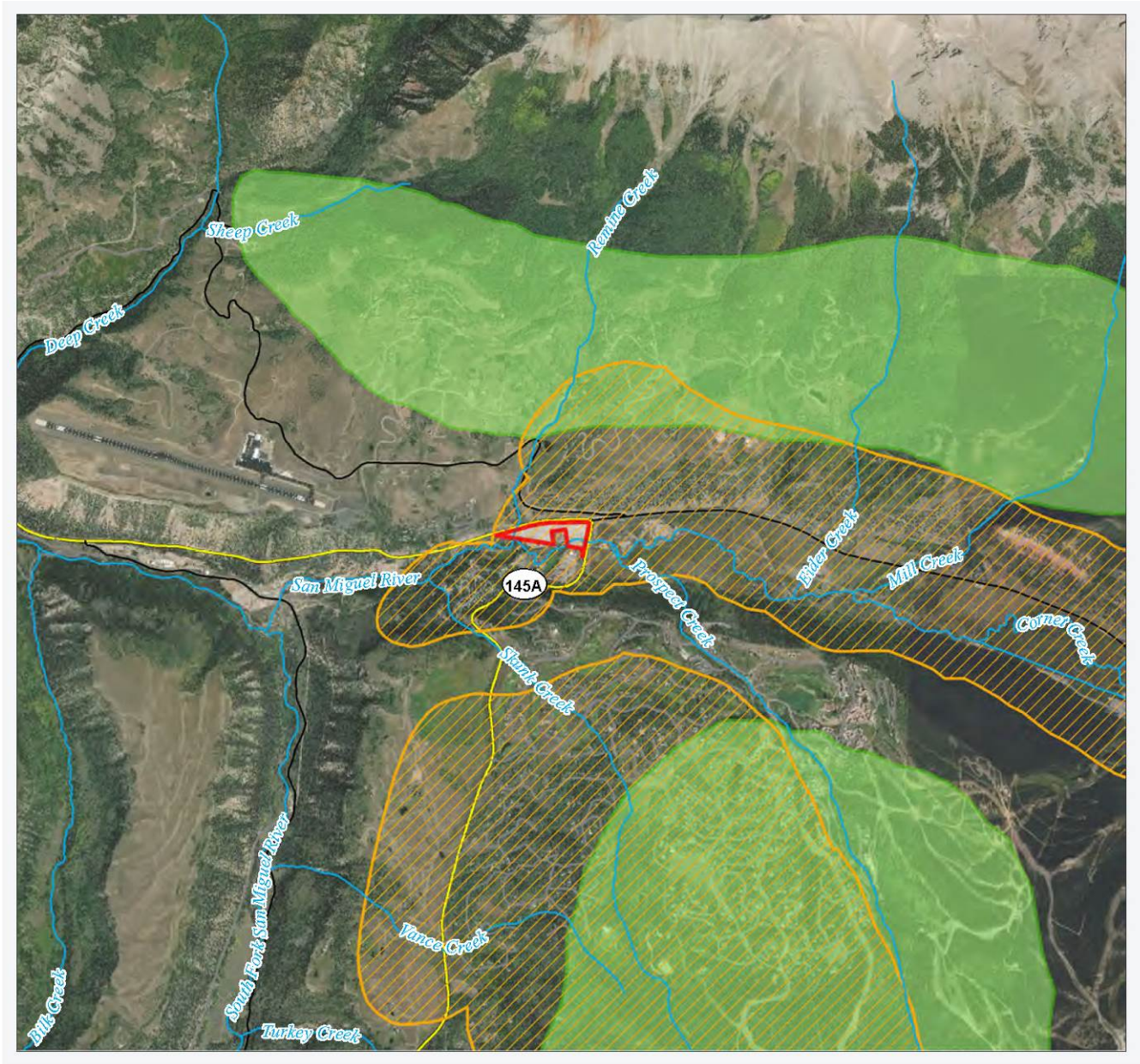
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5.3 Other Wildlife Considerations

5.3.1 Black Bear

Black bear (*Ursus americanus*) has become a significant wildlife management issue in the State of Colorado. Bears are commonly supplementing their diets by raiding garbage cans, breaking into homes, and becoming a hazard and a nuisance. Although the Parcel itself does not contain attractive vegetation for black bear foraging, the area around the Parcel includes montane woodlands and mixed mountain shrublands, which are considered to be good habitat for bears. The Parcel is within a CPW-mapped Black Bear Human Conflict Area. This development would have minor to insignificant impacts on bear populations or bear habitat. However, the proposed development could introduce new attractants to the area, including food and garbage storage, food remnants or scent attractants, and fruit-bearing landscaping vegetation. The development should include standard protective measures to discourage bear interactions, including bear-proof trash containers, a prohibition on outdoor pet feeding, avoidance of bird feedings with seed, and landscaping guidelines prohibiting the planting of fruit-bearing trees within the project area.

Figure 7 - Black Bear Habitats



LEGEND

-  Rivers/Streams
-  Roads
-  Highways
-  Society Turn Parcel
-  Black Bear Human Conflict Area
-  Black Bear Summer Concentration

Black Bear Habitat

San Miguel Valley Corporation

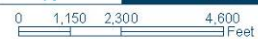
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5.3.2 Elk

In the southern Rocky Mountains, as elsewhere in North America, elk are often associated with edge (ecotone) habitats where forested and meadow/shrubland systems are intermingled. During much of the year, elk are typically found near edges where forests grow adjacent to parks, meadows, or alpine tundra (Fitzgerald et al. 1994). During the summer months, elk may spend significant amounts of time feeding in open alpine environments above treeline. Use of alpine habitats is thought to be associated with the cooler temperatures, persistent snowbanks, and breezy conditions that keep bothersome flying insects to a minimum (Adams 1982, Lyon and Ward 1982). Similarly, during the winter elk may congregate in sagebrush expanses, pinyon and juniper woodlands, irrigated meadows, and other open habitats that are significant distances from forested cover (Lyon and Ward 1982). While habitats used by elk vary considerably over the course of a year, elk tend to inhabit higher elevations during the summer, and migrate to lower elevations and/or south-facing slopes during the winter. On winter ranges, elk form mixed herds of bulls, cows, and calves (Fitzgerald et al. 1994), but in the more developed areas in Colorado, bulls may avoid traditional winter ranges that are near high-use roads, homes, and other human developments (B. Andree, CPW pers. comm. 2006, Dodd et al. 2007).

Generally, elk feed at twilight and at night, but they readily forage and disperse through the daylight hours (Fitzgerald et al. 1994). Most elk mortality is due to predation on calves, hunting, and winter starvation (Fitzgerald et al. 1994). Localized mortality from vehicle strikes may also produce noticeable impacts on herds where traffic exceeds 1,000 AADT, and traffic travels at high speeds (Gagnon et al. 2007). These conditions are found on the roadways that border the Parcel.

Elk are generalist feeders, but usually prefer to graze on grasses, grass-like plants, and forbs during the non-winter months (Nelson and Leege 1982, Fitzgerald et al. 1984). The specific diet for elk in a particular locality is largely determined by the season and palatability of available forage plants (Nelson and Leege 1982). In Colorado, elk show a clear preference for grasses and grass-like plants (Hoover and Wills 1984). Browse species can also vary by site and palatability of available plants. Shrubs, deciduous trees, and sometimes conifers compose much of the winter diet when snow depth limits access to grasses, sedges, and forbs (Nelson and Leege 1982).

On Colorado winter ranges, Gambel's oak (*Quercus gambelii*), aspen (*Populus tremuloides*), serviceberry (*Amelanchier* spp.), sagebrush (*Artemisia* spp.), and snowberry (*Symphoricarpos* spp.) are the major browse species used by elk (Hoover and Wills 1984). Locally heavy feeding on aspen bark during the winter and spring can be very significant and can leave long-lasting impacts on aspen stands.

Issues of Concern. CPW staff have indicated that most herds near mountain communities have decreased in size from 50 to 60 percent since their peak population sizes in the mid- to late-1990s. While direct habitat loss has slowed from the 2000s, there has been a widespread increase in outdoor uses around communities, primarily through increased trail construction, and now almost year-round recreation (C. Wescoatt and B. Andree, CPW District Wildlife Managers, as cited in Vail Daily, 6/16/2018; J. Mao, CPW Terrestrial Biologist, pers. comm. 10/10/2018). There is no one definitive activity or habitat impact that can be strongly linked to elk population declines, but the current hypothesis is that the long-term reduction in winter ranges and increased year-round human pressure (primarily through recreation) in habitats are having cumulative impacts at a level where elk's ability to produce viable numbers of calves is unable to replace yearly mortality (J. Mao pers. comm. 10/10/2018).

For a number of years, a concern for both state (CPW) and federal (USFS) biologists has been the lack of elk security habitat on summer ranges, primarily where high road densities have led to changes in elk distribution and/or herd composition. Elk commonly retreat to secure areas, defined

as areas of cover away from roads, during periods of stress (Hillis et al. 1991). Even non-consumptive recreational activities are detrimental to elk, causing animals to alter behavior patterns, expend energy to avoid humans, and possibly abandon preferred habitats (Knight and Cole 1995, Morrison 1992, Phillips and Alldredge 2000, Thompson 2017, J. Mao pers. comm. 10/10/2018). Almost 20 years ago, Phillips (1998, Phillips and Alldredge 2000) conducted research on the impacts of recreational disturbances to calving elk in the Beaver Creek and Vail Ski Areas on the White River National Forest. Their results showed that human-induced recreational disturbance of elk during the calving season reduced the reproductive success of elk, with a decrease of 18% to 22% of calves per cow surviving to the first winter.

CPW has mapped (through the Species Activity Mapping [SAM] effort) the valley floor of the San Miguel, including the Parcel, as Severe Winter Range. Prior to extensive development in the Telluride area, elk may have utilized a wide winter movement corridor across the valley, but given the steep slopes in the portion of the valley immediately adjacent to the Parcel area, most elk migrations and movements historically occurred and currently persist up-valley from the Parcel. The presence of existing developments immediately south of the Parcel (water treatment plant, electric substation and yards, and commercial developments on the south side of the San Miguel River) have created some areas where elk movement and migration are assumed to already be severely curtailed. Incidental elk movement does occur through the Parcel based on direct observation and occasional fence damage, but elk generally avoid the developed areas that surround the Parcel. On the east side of Highway 145, up-valley from the Parcel, there are extensive areas of protected open space, and elk herds are able to migrate and linger with little harassment in these areas. It can be assumed that elk preferentially travel between high-elevation and valley-floor habitats through these open space areas, and do not utilize the Parcel extensively. This assumption is corroborated by interviews with the property manager of the Parcel and by personal observation (M. Weedman, pers. comm).

Effects Analysis. Although the Parcel is included in the larger regional Severe Winter Range habitat map, the area proposed for development has already lost most habitat value for elk due to existing development. Further development of the property would not impact any areas of highly effective elk habitats. The Parcel may see some elk transitional use, but given a lack of shrubs and the occasional development of deep snowpack, this area would not generally be used as winter range. Elk also prefer higher-elevation areas in the summer, and therefore there would be minimal impact to effective summer range.

Elk migrate through the Parcel occasionally, but given the presence of existing adjacent developments, elk movement is already constrained, and most elk use would occur east of Highway 145 on the Valley Floor Property. Any existing use of the Parcel is distributed across the property, with no apparent concentration of use in any particular corridor. The proposed development would generally remove any remaining habitat value or movement corridor value on the Parcel and curtail any casual and incidental use that currently occurs, but habitat effectiveness on the property has already been drastically reduced. Elk would continue to have ample areas to migrate and forage in habitats east of Highway 145, and therefore it is unlikely that development of this property would result in any significant detrimental impacts to elk populations in the local area.

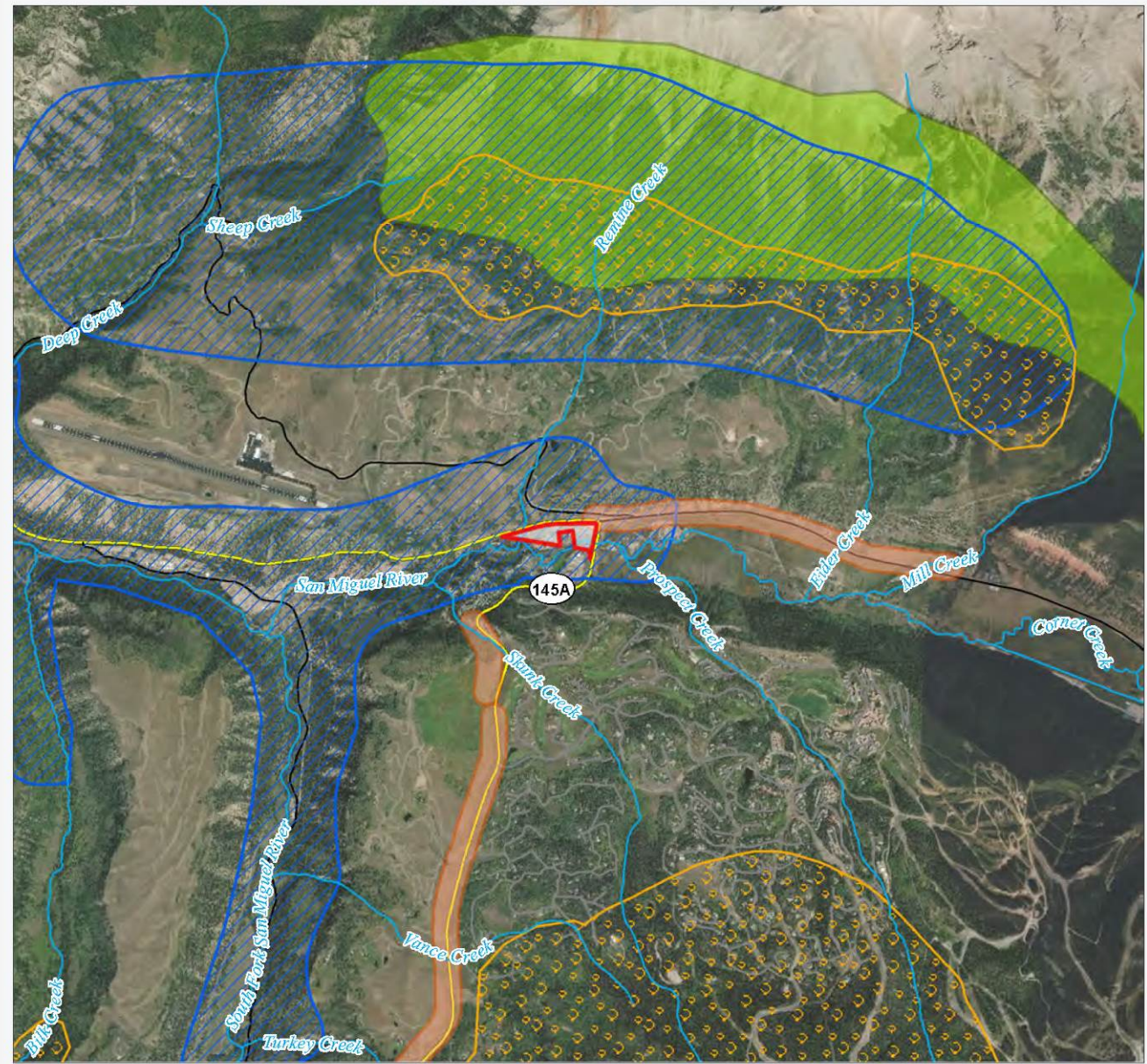
Helicopter operations have the potential to disrupt elk not only on the Parcel but in the immediately surrounding area. However, given the extremely limited number of flights anticipated (less than one per month on average), there is no anticipated adverse effects to the greater elk population in the vicinity (CPW-M. Caddy, pers. comm.). However, individual elk may continue to use the pasture areas of the Parcel incidentally, after the medical center is developed but before the other planning areas are constructed. Elk on the property could be flushed during a helicopter landing and could flee across Highway 145, creating a collision risk for motorists and elk.

However, the helicopter use currently occurs at the Shell gas station, where it represents a significantly larger risk of impact to elk, due to proximity to protected open space and the bottomlands of Mill Creek, which are known to be heavily used by elk during the winter and calving seasons, and also because the landing site is at ground level rather than elevated.

Additional mitigation to protect motorists and elk could include establishing less impactful flight paths for the helicopter. As previously stated, the helicopter operations are regulated by the Federal Aviation Administration, and those requirements supersede wildlife mitigation recommendations. However, within the guidelines of the regulations, flight paths could be established that maintain a higher elevation and that concentrate the helicopter path on the medical center vicinity, with minimal overflight of the eastern end of the Parcel where elk use would be more likely.

Additional safety measures to reduce the risk to motorists from flushed elk should be considered, including cautionary signage on Highway 145. In coordination with CDOT, Variable Message Signs (VMS) could be installed that warn motorists of potential elk crossing during winter seasons. Alternatively, the VMS system could be linked to the pilot-operated lighting system for the helicopter landing pad, and the VMS could display cautions or temporarily reduce speed limits on Highway 145 during helicopter operations.

Figure 8 - Elk Habitats



LEGEND

- Rivers/Streams
- Roads
- Highways
- Society Turn Parcel
- Elk Highway Crossings
- Elk Production Area
- Elk Severe Winter Range
- Elk Summer Concentration Area

Elk Habitat

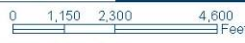
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SCALE: 1" = 1 miles

5.3.3 Mule Deer

Mule deer occur throughout Colorado and are relatively common in the western portion of the State. Mule deer occupy all ecosystems in Colorado from grasslands to alpine tundra, but they reach their greatest densities in shrublands on rough, broken terrain, which provides abundant browse and cover. Their wide distribution and general adaptability make for broad diets. However, deer are considered to be browsers (primarily eating shrubs and twigs), as opposed to grazers (which eat mostly grasses). In Colorado the winter diets of mule deer consist of browse from a variety of trees, shrubs (74%) and grasses and forbs (26%), depending on local browse availability. In the spring and summer, browse contributes around 50% of the diet, and forbs and grasses make up the remainder. When heavy snows bury grasses and forbs on rangelands and force mule deer to consume high amounts of sage and juniper, mortality rates increase due to malnutrition. Mule deer seem to be able to survive without free water except in very arid environments; however, they do drink available water and also eat snow (Fitzgerald et al. 1994).

Mule deer are mostly nocturnal and crepuscular in the warmer summer months and become more diurnal during winter. Activity depends on local conditions including temperature, season, weather, and forage. Over much of Colorado the species is migratory, summering at higher elevations and moving downslope to winter ranges. In some areas of Colorado migrations may be over 55 miles, but in most areas, migrations are closer to about 5 miles. The routes followed are often habitual, and deer show a certain amount of fidelity to these routes. Snow depths of 8 to 16 inches appear to trigger fall movements, and depths over 3 feet prevent use of an area (Loveless 1967). In some areas of northwestern Colorado mule deer begin migrations before snow accumulation (Garrott et al. 1987, as cited in Fitzgerald et al. 1994). These authors suggest that better-quality forage on winter range at that time of year triggers the movements. Throughout the winter mule deer will move about winter ranges, depending on snowfall and snow-melting events, but prefer to linger on more south-facing slopes where snow depth is shallowest.

Spring and summer ranges are most typically a mosaic of meadows, aspen woodlands, alpine tundra and Krummholz, or montane forest edges. Montane forests and pinyon-juniper woodlands with good shrubby understories are often favored winter ranges. Because of the mule deer's seasonal migratory movements, estimation of home ranges is somewhat difficult; however, deer appear to be seasonally sedentary, staying within areas of 100 to 2,200 acres. In areas where the animals do not migrate significant distances, annual home ranges are 1,700 acres to 5,400 acres (Mackie et al. 1982). Migrating individuals show strong winter and summer range site fidelity.

Mortality in mule deer varies with age class and region. In Colorado annual fawn mortality can vary as much as from 27% to 67% (Anderson and Bowden 1977). Fawn mortality is due to predation and starvation. Larger fawns are more likely to survive, and smaller fawns are more likely to starve. However, predators will take any size of fawn. Winter mortality of fawns may approach 75% annually. Mortality of adult deer is mostly from hunting and starvation (Carpenter 1976). Predators include coyotes, bobcats, golden eagles, mountain lions, black bears, and domestic dogs. Locally, coyote and mountain lion predation on fawns can account for significant mortality within populations. Mule deer may survive up to 20 years in the wild, but such longevity is very rare. In most populations 28% to 43% of the population is replaced each year. Fawns comprise about half of the yearly mortality; while mature females and bucks comprise the remaining 15% and 35%, of the annual mortality, respectively.

Some mule deer use of the property may be expected, primarily in the spring when grasses begin to green up, and then incidentally in the evenings and during periods of seasonal movement and migration. Similar to elk, the presence of other developments adjacent to the property likely have reduced habitat effectiveness in the area, and mule deer use is likely only incidental.

Effects Analysis. Development of the property would not impact effective mule deer habitats; the Parcel may see some mule deer transitional use but given a lack of shrubs and development of a significant winter snowpack, this area would not be preferentially used as winter range. Mule deer also summer higher in the mountains, and therefore there would be no impact to effective summer range.

Mule deer may migrate through the area, but given the presence of existing adjacent developments, mule deer movement across this area is already significantly constrained and impaired, and most mule deer use would occur east of Highway 145 in the Valley Floor Property. Any existing use of the Parcel is distributed across the property, with no apparent concentration of use in any particular corridor. The proposed development would generally remove any remaining habitat value or movement corridor value on the Parcel and curtail any casual and incidental use that currently occurs, but habitat effectiveness on the property has already been drastically reduced. However, the open space design does conserve some wildlife value for the riparian corridors of the San Miguel River and Remine Creek.

Mule deer habituate to human activity to a greater extent than elk do, therefore some mule deer use of the Parcel would likely persist once construction is complete, primarily at night. Mule deer would also continue to have ample areas to migrate and forage in habitats east of Highway 145; therefore, it is unlikely that development of this property would result in any significant detrimental impacts to mule deer.

Helicopter impacts to mule deer are likely to be similar but less severe than those to elk, primarily as mule deer generally habituate to disturbance more readily than elk, and are known to be less sensitive to air operations than elk (Churchill 2003). Given the extremely limited number of flights anticipated (less than 1 per month on average), there is no anticipated adverse effects to the greater mule deer population in the vicinity (CPW-M. Caddy, pers. comm.). However, individual deer may continue to use the pasture areas of the Parcel incidentally, after the medical center is developed but before the other planning areas are constructed. Flushed mule deer could create an accident risk for motorists on Highway 145 during helicopter landings. However, the current helicopter use at the Shell gas station represents a significantly larger risk of impact, due to proximity to protected open space and the bottomlands of Mill Creek.

As previously described, mitigation measures could cautionary signage or variable message/adaptive signage that lowers speed limits and alerts motorists when helicopter operations are occurring. Flight paths could also be established that maintain a higher elevation and that concentrate the helicopter path on the medical center vicinity, with minimal overflight of the eastern end of the Parcel, if feasible within operational constraints and FAA regulatory requirements.

Figure 9 - Mule Deer Habitat



LEGEND

-  Rivers/Streams
-  Roads
-  Highways
-  Society Turn Parcel
-  Mule Deer Highway Crossing
-  Mule Deer Winter Range

Mule Deer Habitat

San Miguel Valley Corporation

Society Turn Parcel
Wildlife Assessment

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Date: 1/21/2019
Version: 01
Created By: SGM
Drawn By: RKK

0 1,150 2,300 4,600
Feet

SCALE: 1" = 1 miles

5.3.4 Migratory Birds, Birds of Conservation Concern and Raptors

The Migratory Bird Treaty Act (MBTA), established in 1918, made it unlawful to pursue, hunt, kill, capture, possess, sell, purchase, or barter any migratory bird, including the feathers or other parts, nests, eggs, or migratory bird products. This section also identifies USFWS listed Birds of Conservation Concern (BCC) (USFWS 2008). The primary statutory authority for development of BCC lists is the Fish and Wildlife Conservation Act of 1980 (FWCA), as amended; other authorities include the Endangered Species Act of 1973, the Fish and Wildlife Act of 1956, and 16 U.S.C. § 701. The 1988 amendment (Public Law 100-653, Title VIII) to the FWCA requires the Secretary of the Interior, through the USFWS, to “*identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973.*” The BCC 2008 list is the most recent effort by the USFWS to carry out this proactive conservation mandate and update *Birds of Conservation Concern 2002*. The overall goal of the BCC effort is to accurately identify those species (beyond those already federally listed as threatened or endangered) in greatest need of conservation action at three different geographic scales.

Pursuant to the MBTA, construction activities in wetland, stream, and woodland habitats that would otherwise result in the taking of migratory birds, eggs, young, and/or active nests should be avoided. Although provisions of the MBTA are applicable year-round, most migratory bird nesting activity in Colorado (at the elevation of the study area) occurs during the period from approximately April 15 to August 30. If proposed construction is planned to occur during the primary nesting season, the USFWS recommends that the project proponents arrange to have a qualified biologist conduct a field survey of the affected habitats and structures to determine the absence or presence of nesting migratory birds. During this period, nests containing eggs or young as indicated by the observation of eggs, young birds, or by the presence of adult birds engaged in nesting activities will be considered active.

Table 1 lists species on the USFWS Birds of Conservation Concern list (USFWS 2008) that may be present within the study area; species with no “x” in columns do not have suitable habitats within the project area.

Table 1. Birds of Conservation Concern that May Be Affected in the Study Area

Species Name	Agricultural Meadows	Wetlands
American Bittern (<i>Botaurus lentiginosus</i>)		
Bald Eagle (<i>Haliaeetus leucocephalus</i>)		
Black Rosy-Finch (<i>Leucosticte atrata</i>)		
Brewer's Sparrow (<i>Spizella breweri</i>)		
Brown-capped Rosy-Finch (<i>Leucosticte australis</i>)		
Cassin's Finch (<i>Caprodacus cassinii</i>)		
Ferruginous hawk (<i>Buteo regalis</i>)		
Flammulated Owl (<i>Otus flammeolus</i>)		
Golden Eagle (<i>Aquila chrysaetos</i>)		
Juniper Titmouse (<i>Baeolophus ridgwayi</i>)		
Lewis's Woodpecker (<i>Melanerpes lewis</i>)		

Species Name	Agricultural Meadows	Wetlands
Loggerhead Shrike (<i>Lanius ludovicianus</i>)		
Long-billed Curlew (<i>Numenius americanus</i>)		
Mountain Plover (<i>Charadrius montanus</i>)		
Olive-Sided flycatcher (<i>Cantopus cooperi</i>)		X
Peregrine Falcon (<i>Falco peregrines</i>)		
Pinyon Jay (<i>Gymnorhinus cyanocephalus</i>)		
Prairie Falcon (<i>Falco mexicanus</i>)		
Sage Thrasher (<i>Oreoscoptes montanus</i>)		
Short-eared Owl (<i>Asio flammeus</i>)		
Snowy Plover (<i>Charadrius alexandrinus</i>)		
Swainson's hawk (<i>Buteo swainsoni</i>)	X	
Veery (<i>Catharus fuscescens</i>)		
Virginia's Warbler (<i>Vermivora virginiae</i>)		X
Western Grebe (<i>Aechmophorus occidentalis</i>)		
Williamson's Sapsucker (<i>Sphyrapicus thyroideus</i>)		
Willow Flycatcher (<i>Empidonax traillii</i>)		

The project would result in the conversion of agricultural fields to urban/suburban habitats. Of the listed BCC species, only the Swainson's hawk may be found foraging within the Parcel; no nesting habitat is available within the Parcel. Some species may use shrubby (willow) and treed habitats along the river, but the development is far enough away from these habitat features that significant indirect impacts to these habitats would not be expected. No impacts to BCC would be expected from development of the Parcel.

6.0 Noxious Weeds

Noxious weeds can pose a threat to the integrity of the natural vegetation communities. A comprehensive weed inventory has not been performed on the Parcel, since the precise locations of development and schedule of build-out have not been determined. This section provides background information regarding noxious weeds, outlines general goals for the property, and provides suggestions for effective management.

6.1 Weed Survey Results

Photos and data forms from a previously-completed wetland delineation reports were reviewed (BWC 2008, 2013), which recorded isolated patches of Canada thistle (*Cirsium arvense*) distributed sporadically throughout the wet and mesic portions of the pasture areas.

Other common weed species in the area are likely to occur on the property, but their presence and extent have not been comprehensively mapped at the time of this report.

6.2 Weed Management

It is assumed that final development proposals for the property would include a complete weed inventory and management plan, in accordance with San Miguel County requirements and the San Miguel County Weed Control Program. Management of noxious weeds on this property will need to account for the proposal that the Planning Areas will be developed in a phased approach. Therefore, surface disturbance and bare soil conditions may be created adjacent to areas that remain under current pasture conditions. The combination of release from livestock grazing pressure and disturbance of development may cause a considerable increase in weed populations on disturbed areas. Livestock likely have been grazing Canada thistle for years and keep these weeds and their growth suppressed. It is also well-known that all weeds are opportunists and easily invade disturbed soils and out-compete native vegetation very easily.

The most effective and suitable techniques for managing a given weed infestation depend on many factors: access, growth form of the weed species (e.g. annual, biennial, or perennial), size of the weed patch, proximity of the weed patch to sensitive areas (water sources, rare plant or animal habitat, etc.), and the weather and temperature at the time of control. Given that plans for the Parcel involve the conversion of pastureland to mixed-use development, techniques for managing weeds should include a combination of mechanical (e.g. pulling, mowing, and cutting) and herbicides. Cultural controls (e.g. maintaining native plant communities, fire, reseeding, livestock grazing) and biological control agents are not likely to be appropriate methods in the long term for weed management on the Parcel, although they could be implemented on the portions that remain under grazing management during the phased build-out process.

6.3 Revegetation

Successful weed control programs may require a sizeable budget for revegetation of the area formerly occupied by noxious weeds. In the case of this project, where high-density mixed-use development is proposed which would entirely replace the ground cover over large areas of the Parcel, landscaping is expected to provide ground cover for those portions of the Planning Areas that do not have hard surface. Since most weeds are ruderal species that prefer disturbed sites, surface coverage in landscaped areas should be provided as soon as possible following disturbance, using annual cover vegetation and/or abiotic groundcovers. This will minimize the likelihood that weeds will become established on bare soil. If an area has been treated with

herbicides, refer to the label on the herbicide to determine how soon after treatment reseeding is recommended (herbicides have varying residence time in the soils). Additionally, it is preferable to salvage topsoil to retain viable soil as well as a native seed bank.

The Open Space areas of the Parcel will also have disturbance, associated with the construction of proposed pedestrian paths and the augmentation pond. In these areas cultural controls such as maintaining native plant communities and reseeding areas of disturbance are appropriate for consideration in concert with mechanical and chemical controls.

7.0 San Miguel County Land Use Code Review

The following sections of the San Miguel County Land Use Code (LUC), Section 5-4 apply to the existing resources and proposed development on the Parcel. Sections of the LUC not listed here do not apply to the Parcel, based on existing conditions and proposed uses. The preliminary development plan presented here would be consistent with all the relevant and applicable wildlife-related sections of the LUC, specifically Section 5-407 Wildlife Habitat Areas.

7.1 5-407 A. General Standards

As described in **Section 5.0**, the Parcel does contain wildlife habitat areas, although in general the effectiveness of the habitat is low given the extensive existing anthropogenic disturbances. The following general standards apply to all wildlife areas, and have relevance to the resources located within the Parcel, or applicability to the development proposed for the Parcel.

- I. Residential development shall be clustered to avoid impacting wildlife and their habitat.

The residential development proposed will be clustered in the Planning Areas, as discussed.

- II. Removal of vegetation shall be minimized. Vegetation removed shall be promptly replaced with beneficial native browse species.

Vegetation removal would generally be limited to agricultural cultivar pasture grasses, and would be replaced by hardscape and landscaping. Native vegetation removal has been minimized by the siting of development in the pasture areas of the Parcel.

- III. Wildlife food, cover, and water shall be preserved and development effects that would destroy these shall be mitigated. Special consideration shall be given to trees and shrubs with high wildlife food value, especially heavy seed, berry and fruit producing species.

As discussed, the portions of the Parcel proposed for development have minimal vegetation diversity or cover. There are no areas of vegetation with high wildlife food value. Vegetation removal would generally be limited to agricultural cultivar pasture grasses, and would be replaced by hardscape and landscaping.

- IV. The planting of wildlife food species and woody cover along fences shall be encouraged as one way of improving wildlife habitat.

No fences are currently proposed as a component of the final development plans, and the high-density mixed use development proposed is not compatible with the development or maintenance of significant food resources or cover along the perimeter of the Parcel.

- V. Waterholes, springs, seepage, marshes, pond and watering areas shall be preserved.

The only hydrologic resources on the Parcel are the San Miguel River and Remine Creek. Conditions and wildlife access to these resources will not be affected or hindered by the proposed development.

- VI. Known endangered species habitats shall be preserved and all disturbances to those habitats shall be minimized.

Section 5.1 discusses the absence of habitat or impacts to endangered species.

- VII. Every golden eagle nest site, bald eagle roost site, and all other raptor nest sites shall be protected from the adverse impacts of development within a ½ mile buffer.

No eagle nests or raptor nests are present on the Parcel.

- VIII. Mesh or woven fences shall be prohibited and are encouraged to be removed.
- As discussed in **Section 4.1.5**, the small areas of woven-wire fencing on the Parcel will be removed. They are currently in poor repair and are not necessary for continued grazing activity.
- IX. Fences located within CPW designated mapped wildlife habitat areas are discouraged. Fences in such wildlife habitat areas shall be limited to “wildlife friendly fences” that are in compliance with applicable CPW fencing standards.
- As discussed in **Section 4.1.5**, existing fencing needed to control existing grazing uses has recently been upgraded to improve wildlife safety. Upgrades improved proper tensioning and the use of smooth top wire, to reduce the likelihood of entanglement.
- As development proceeds in phases, perimeter fencing would be removed from the developed areas. At final development stage, no perimeter fencing would remain on the Parcel.
- X. Residential development shall maintain bear proof storage for garbage disposal for all parcels located in all zone districts.
- The development should include standard protective measures to discourage bear interactions, including bear-proof trash containers, a prohibition on outdoor pet feeding, avoidance of bird feedings with seed, and landscaping guidelines prohibiting the planting of fruit-bearing trees within the project area.
- XI. Development activities, such as Subdivisions, PUDs and Special Use Permits uses may require a Wildlife Impact Assessment prepared by a qualified wildlife biologist or scientist for all mapped wildlife habitat areas or known habitat areas to be submitted with the land use application. The Impact Assessment should include changes, trends and proposed mitigation to be reviewed by the Colorado Parks and Wildlife or other County review staff.
- This report constitutes the impact assessment for the project.
- XII. Barking dogs, dogs at large, and stray dogs are not permitted in any unincorporated portion of San Miguel County pursuant to Board of County Commissioner Resolution 1982-27 or as may be set forth in the most current Board of County Commissioner Resolution regarding dog or animal control rules and regulations.
- The residential development within the Parcel should establish community standards governing the ownership and control of dogs, to reduce the likelihood of wildlife harassment and to prevent free-roaming dogs entirely.
- XIII. It is illegal for dogs to chase and/or harass wildlife, on public or private property. A Colorado wildlife officer or other peace officer may capture or kill any dog he or she determines to be harassing wildlife, pursuant to C.R.S. §33-6-128.
- This statute should be acknowledged in any HOA bylaws or disclosures presented to residential property buyers.

7.2 5-407 B. Deer, Elk, and Bighorn Sheep Severe Winter Range

The Parcel contains Elk Severe Winter Range (**Figure 8**). As discussed in **Section 5.3.2**, although the Parcel is included in the larger regional Severe Winter Range habitat map, the specific area proposed for development has already lost most habitat value for elk due to existing conditions and surrounding development. Further development of the property as proposed would not impact any

areas of highly effective elk habitats. The Parcel does see some incidental and transitional use by elk, but given a lack of shrubs and cover, the occasional development of deep snowpack, and existence of extensive areas of preferable habitat in the Valley Floor property, the Parcel would not generally be used as winter range.

7.3 5-407 C. Deer, Elk, and Bighorn Sheep Winter Range

The Parcel contains Mule Deer Winter Range (**Figure 9**). As discussed in **Section 5.3.3**, development of the Parcel would not impact effective mule deer habitats. The Parcel may see some mule deer transitional use in the winter and shoulder seasons, but given a lack of shrubs and the development of a significant winter snowpack, this area would not be expected to be preferentially used as winter range.

7.4 5-407 F. Riparian Areas and Shorelands

Land uses located in riparian or shoreland areas shall comply with the standards in 5-407 A. and the standards in this section.

- I. Development and the removal of vegetation and disturbance of ground cover within the riparian area shall be prohibited.
- II. Culverts shall be designed to prevent plugging and washouts.
- III. Culverts that may become barriers to fish passage shall be prohibited.
- IV. Riparian and shoreland habitat areas that have been denuded or disturbed by development shall be revegetated in the first available growing season.

The development plan would be in compliance with these standards, since no disturbance is proposed for the riparian and shoreland areas of Remine Creek and the San Miguel River. The trail crossing of Remine Creek would be via elevated crossing, and the trail crossing of the San Miguel River would use the existing Highway 145 bridge (**Section 4.1.4**). No culverts are proposed.

8.0 Impact Mitigation Recommendations

Most of these recommendations have already been considered and incorporated into the current development proposal through the applicant's internal iterative revision process. Additional recommendations, and in particular black bear conflict avoidance measures, should be considered by the developers, as recommended by CPW.

1. Retain high value habitats by avoiding additional encroachment into intact blocks of native habitats after development concludes. Particularly, social/volunteer trails into the riparian areas adjacent to San Miguel River should be prevented, or closed and rehabilitated if they occur. The extensive existing and planned designated trails should be sufficient to accommodate expected levels of recreational use.
2. Any recreational trails considered should be for non-motorized use only.
3. With the exception of fencing required for safety and operational security for the medical center, fencing should be limited on the Parcel under final development conditions. Fencing restricts big game movements, potential habitat uses, and can result in wildlife mortality through entanglement and vehicle collisions. Any decorative fencing should be designed to allow for wildlife movements.
4. Remove all existing woven wire fencing and decrepit fencing on site, and replace with the minimum extent of wildlife-friendly cattle fencing to accommodate continued grazing on the Parcel during phased development.
5. Reduce lighting impacts by installing low-intensity shielded outdoor lighting, especially near the riparian areas along the San Miguel River and Remine Creek.
6. Establish community standards governing the ownership and control of dogs on the Parcel, to reduce the likelihood of wildlife harassment and to prevent free-roaming dogs entirely.
7. Consider warning signage or adaptive signage on Highway 145 to mitigate the risk to motorists from ungulates fleeing across Highway 145 during occasional helicopter landings.
8. Avoid helicopter overflight of the Valley Floor Open Space, if feasible within FAA regulatory requirements and operational constraints. Consider establishing minimum helicopter flight elevations above the high value habitat on the Valley Floor property if FAA compliance requires overflight.
9. Standard bear-safety measures for facility design and operation should be applied, due to location within a Black Bear Human Conflict Area.

9.0 Qualifications of Report Author

The primary author for this report was Alexander Nees, Senior Ecologist at SGM. Mr. Nees holds a Master of Science degree in Biology from Stanford University and a Bachelor of Arts degree in Ecology and Evolutionary Biology from Princeton University. Mr. Nees has over 10 years of natural resource planning, environmental assessment, and biological management experience. As a professional consulting biologist working in the private sector, the non-profit sector, and for the Bureau of Land Management, he has authored numerous Biological Evaluations and Biological Assessments for NEPA and Endangered Species Act compliance for wildlife (and plant) species in Colorado, Utah, Wyoming, and New Mexico. He has produced management plans and impact analyses for federal, state, and private natural resource projects, and conducted numerous surveys for Threatened, Endangered, and Sensitive species in Colorado, Utah, Wyoming, Arizona, and New Mexico.

Mr. Nees has developed a variety of wildlife impact assessments, vegetation monitoring and vegetation management projects, wetland delineations, and research-based projects for clients including the USDA Forest Service, Bureau of Land Management, Counties and municipalities throughout western Colorado, and various private entities in western Colorado and the surrounding areas.

Wildlife and vegetation assessment reports and compliance documentation have been provided for entities such as Vail Resorts, Town of Avon, SG Interests, Rio Tinto Kennecott Utah Copper LLC, Chesapeake Energy, Town of Fruita, Union Pacific Railroad, Burlington Northern and Santa Fe Railroad, Mesa County, and many other entities.

Mr. Nees has been with SGM since 2018, and previous to working with SGM he was a Senior Ecologist with MountainWest and a biologist with Olsson Associates. He was also a NEPA Specialist for the Bureau of Land Management and has managed federal contracts for biological restoration on federal and private lands within the non-profit sector for several years in Utah and New Mexico.

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Appendix A - CPW Habitat Definitions

The following section defines the ungulate seasonal activity area definitions used by CDOW in their habitat mapping protocol.

ELK

HIGHWAY CROSSING: Those areas where elk movements traditionally cross roads, presenting potential conflicts between elk and motorists.

MIGRATION CORRIDORS: A specific Mappable site through which large numbers of animals migrate and loss of which would change migration routes.

OVERALL RANGE: The area which encompasses all known seasonal activity areas within the observed range of an elk population.

PRODUCTION AREA: That part of the overall range of elk occupied by the females from May 15 to June 15 for calving. (Only known areas are Mapped and this does not include all production areas for the DAU).

RESIDENT POPULATION: An area used year-round by a population of elk. Individuals could be found in any part of the area at any time of the year; the area cannot be subdivided into seasonal ranges. It is most likely included within the overall range of the larger population.

SEVERE WINTER: That part of the range of a species where 90 percent of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten. The winter of 1983-84 is a good example of a severe winter.

SUMMER CONCENTRATION: Those areas where elk concentrate from mid-June through mid-August. High quality forage, security, and lack of disturbance are characteristics of these areas to meet the high energy demands of lactation, calf rearing, antler growth, and general preparation for the rigors of fall and winter.

SUMMER RANGE: That part of the range of a species where 90% of the individuals are located between spring green-up and the first heavy snowfall, or during a site specific period of summer as defined for each DAU. Summer range is not necessarily exclusive of winter range; in some areas winter range and summer range may overlap.

WINTER CONCENTRATION: That part of the winter range of a species where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten.

WINTER RANGE: That part of the overall range of a species where 90 percent of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site specific period of winter as defined for each DAU.

MULE DEER

CONCENTRATION AREA: That part of the overall range where higher quality habitat supports significantly higher densities than surrounding areas. These areas are typically occupied year round and are not necessarily associated with a specific season. Includes rough break country, riparian areas, small drainages, and large areas of irrigated cropland.

HIGHWAY CROSSING: Those areas where mule deer movements traditionally cross roads, presenting potential conflicts between mule deer and motorists.

MIGRATION CORRIDORS: A specific Mappable site through which large numbers of animals migrate and loss of which would change migration routes.

OVERALL RANGE: The area which encompasses all known seasonal activity areas within the observed range of a mule deer population.

RESIDENT POPULATION: An area that provides year-round range for a population of mule deer. The resident mule deer use all of the area all year; it cannot be subdivided into seasonal ranges although it may be included within the overall range of the larger population.

SEVERE WINTER: That part of the overall range where 90% of the individuals are located when the annual snowpack is at its maximum and/or temperatures are at a minimum in the two worst winters out of ten.

SUMMER RANGE: That part of the overall range where 90% of the individuals are located between spring green-up and the first heavy snowfall. Summer range is not necessarily exclusive of winter range; in some areas winter range and summer range may overlap.

WINTER CONCENTRATION: That part of the winter range where densities are at least 200% greater than the surrounding winter range density during the same period used to define winter range in the average five winters out of ten.

WINTER RANGE: That part of the overall range where 90 percent of the individuals are located during the average five winters out of ten from the first heavy snowfall to spring green-up, or during a site specific period of winter as defined for each DAU.

BLACK BEAR

FALL CONCENTRATION: That portion of the overall range occupied from August 15 until September 30 for the purpose of ingesting large quantities of mast and berries to establish fat reserves for the winter hibernation period.

HUMAN CONFLICT: That portion of the overall range where two or more confirmed black bear complaints per season were received which resulted in CDOW investigation, damage to persons or property (cabins, tents, vehicles, etc.), and/or the removal of the problem bear(s). This does not include damage caused by bears to livestock.

OVERALL RANGE: The area which encompasses all known seasonal activity areas within the observed range of a population of black bear.

SUMMER CONCENTRATION: That portion of the overall range of the species where activity is greater than the surrounding overall range during that period from June 15 to August 15.

Appendix B - Photolog

Appendix C - CPW Species of Concern

Species discussed in the text are highlighted in **BOLD**.

Species ¹	Occurrence	Habitat Association	Potential Habitat in Project Area?	Potential Impact/Issue?
MAMMALS				
American pika (SGCN) <i>Ochotona princeps</i>	Throughout state in suitable habitats	Alpine, rocky habitats	No	No
Black-footed ferret (FE, SE) <i>Mustela nigripes</i>	Rio Blanco & Moffat Counties	Reintroduced to Rio Blanco County, in white-tailed prairie dog colony	No	No
Black-tailed prairie dog (SGCN) <i>Cynomys ludovicianus</i>	Eastern plains	Shortgrass prairies	No	No
Botta's pocket gopher (SGCN) <i>Thomomy bottae rubidus</i>	Northern Front Range	Foothills	No	No
Gray wolf (SE) <i>Canis lupus</i>	Northern counties, no packs in State at this time	Shrublands, forests and areas away from human habitation	No	No
Grizzly bear (SE) <i>Ursus arctos</i>	Rare visitor from Wyoming	Forests, alpine and shrublands	No	No
Fringed myotis (SGCN) <i>Myotis thysanodes</i>	Throughout Colorado in suitable habitats	Roosts in montane and foothills conifers and oakbrush; may forage to as low as greasewood and saltbush shrublands. Roosts and hibernates in caves, mines, and buildings.	No	No
Gunnison prairie dog (SGCN) <i>Cynomys gunnisoni</i>	Parks in central Colorado	Shortgrass steppe, open shrublands in parks	Yes	No
Little brown myotis (SGCN) <i>Myotis lucifigus</i>	Throughout Colorado in suitable habitats	Widespread habitat types.	No	No
Lynx (FT, SE) <i>Lynx canadensis</i>	High mountain areas with large expanses of conifer forests in Colorado	Spruce/fir and lodgepole pine forests, sometimes aspen, shrublands	No	No
New Mexico meadow jumping mouse (FE, SGCN) <i>Zapus hudsonius leuteus</i>	Southwestern counties in Colorado	Wet, lush, grassy meadows and some hydric shrublands	No	No
Olive-backed pocket mouse (SGCN) <i>Perognathus fasciatus</i>	Southern grasslands in Colorado	Arid and semiarid grasslands with sparse vegetation, sandy to clayey soils	No	No
Preble's meadow jumping mouse (FT, ST) <i>Zapus hudsonius preblei</i>	Front range of Colorado north into Wyoming	Foothills riparian areas and along front range streams	No	No

Spotted bat (SCGN) <i>Euderma maculatum</i>	Throughout Colorado in suitable habitats	Areas near cliffs, including piñon-juniper woodlands and streams or water holes within ponderosa pine or mixed coniferous forest. Usually captured around a water source, including desert pools or cattle tanks.	No	No
Townsend's big-eared bat (SGCN) <i>Plecotus townsendii townsendii</i>	Documented in Colorado in several cave locations	Semidesert shrublands, P-J, open montane forests; caves and abandoned mine roosts.	No	No
White-tailed prairie dog (SGCN) <i>Cynomys leucurus</i>	Western Colorado	Arid grasslands and sparse arid shrublands in western CO	No	No
River otter (ST) <i>Lontra canadensis</i>	Throughout state in suitable habitats	Larger rivers with high fish population levels	Yes	No
Wolverine (FT, SE) <i>Gulo gulo</i>	Historical documentation several locations in Colorado-likely extinct	Boreal forests and tundra- large ungulate populations important	No	No
BIRDS				
Brown-capped rosy-finch (SGCN) <i>Leucosticte australis</i>	High mountains throughout state	Alpine and high-elevation coniferous forests	No	No
Bald eagle (SGCN) <i>Haliaeetus leucocephalus</i>	Throughout state near suitable habitats	Larger rivers and streams, near prairie dog towns	Yes	Yes
Burrowing owl (ST) <i>Athene cunicularia</i>	Mostly found in eastern grasslands, some occurrence on west slope	Arid grassland and shrublands	No	No
Columbian sharp-tailed grouse (SGCN) <i>Tympanuchus phasianellus columbianus</i>	Mixed grassland/shrublands in northwest Colorado	Mixed shrubland/grasslands	No	No
Ferruginous hawk (SGCN) <i>Buteo regalis</i>	Eastern plains, larger parks	Grasslands and extensive shrublands	No	No
Golden eagle (SGCN) <i>Aquila chrysaetos</i>	Throughout Colorado in suitable habitats	Open habitats in alpine, shrublands, badlands, and grasslands	No	No
Greater sage-grouse (SGCN) <i>Centrocercus urophasianus</i>	Northwestern Colorado	Large sagebrush shrublands	No	No
Sandhill crane (SGCN) <i>Grus canadensis tabida</i>	Migrant through plains, west slope and mountain valleys, some nesting in northern parks	Large wetlands	No	No
Gunnison sage-grouse (SGCN) <i>Centrocercus minimus</i>	Gunnison Basin and western counties	Sagebrush shrublands	No	No
Least tern (FE, SE) <i>Sterna antillarum</i>	Eastern plains	Larger rivers, larger reservoir beaches	No	No
Lesser prairie chicken (FT, ST) <i>Tympanuchus pallidicinctus</i>	Extreme southeastern Colorado	Great plains grasslands and shrublands	No	No
Long-billed curlew (SGCN) <i>Numenius americanus</i>	Eastern plains and larger parks	Grasslands and sparse shrublands	No	No

Mexican spotted-owl (FT, ST) <i>Strix occidentalis lucida</i>	Southwest Colorado, and along Wet Mountains, Rampart Range	Deep shaded canyons with closed canopy conifers and cliffs	No	No
Mountain plover (SGCN) <i>Charadrius montanus</i>	Eastern plains of Colorado	Summers on eastern plains in native short-grass steppe, winters in S. California & Mexico	No	No
Peregrine falcon (SGCN) <i>Falco peregrinus anatum</i>	Throughout state, but near cliffs and tall buildings	Needs tall cliffs or buildings for nesting, usually occurs near water	No	No
Plains sharp-tailed grouse (SE) <i>Tympanuchus phasianellus</i>	Extreme northeastern Colorado	Grasslands, river canyons	No	No
Piping plover (FT, ST) <i>Charadrius melodus circumcinctus</i>	Eastern plains	Large rivers, sandy shores around reservoirs in plains	No	No
Southern white-tailed ptarmigan (FP, SCGN) <i>Lagopus leucura altipetens</i>	Southern Rocky Mountains	Alpine habitats	No	No
Southwestern willow flycatcher (FE, SE) <i>Empidonax traillii extimus</i>	Extreme southwest Colorado, and Rio Grande River	Brushy riparian habitats at lower elevations	No	No
Western snowy plover (SGCN) <i>Caradrius alexandrius</i>	Eastern plains	Sandy bars in rivers and around reservoirs, playas	No	No
Western yellow-billed cuckoo (SGCN) <i>Coccyzus americanus</i>	North Fork of Gunnison, Colorado, Dolores, Yampa and Rio Grande rivers	Large cottonwood stands along larger rivers	No	No
Whooping crane (FE, SE) <i>Grus americana</i>	Migrates through eastern plains, possibly San Luis Valley	Migrant	No	No
AMPHIBIANS				
Boreal toad (SE) <i>Anaxyrus boreas boreas</i>	Small disjunct populations across higher elevations in the State	Subalpine forest habitats with marshes, wet meadows, streams, beaver ponds, and lakes.	No	No
Couch's Spadefoot (SGCN) <i>Scaphiopus couchii</i>	Southeastern Colorado	Sandy, dry soils with creosote bush and mesquite	No	No
Great Plains narrowmouth toad (SGCN) <i>Castrophryne olivacea</i>	Eastern Colorado	Grasslands, edges of marshes, rocky hills	No	No
Northern cricket frog (SGCN) <i>Acris crepitans</i>	Eastern Colorado	Edges of slow-moving bodies of water	No	No
Northern leopard frog (SGCN) <i>Lithobates pipiens</i>	Common throughout mid- and lower-elevations of Colorado	Wet meadows, marshes, ponds, beaver ponds, streams.	No	No
Plains leopard frog (SGCN) <i>Rana blairi</i>	Eastern Colorado	Sunny, grassy wetlands	No	No
Wood frog (SGCN) <i>Rana sylvatica</i>	Larimer and Grand Counties	Forested wetlands	No	No
FISHES				
Arkansas darter (ST) <i>Etheostoma cragini</i>	Arkansas River drainage in eastern Colorado	Clear, shallow, spring-fed streams with moderate current and lots of rooted aquatic vegetation	No	No

Bonytail chub (FE, SE) <i>Gila elegans</i>	No known populations remain in Colorado	Large, swift-flowing waters of the Colorado River system	No	Yes
Brassy minnow (ST) <i>Hybognathus kankinsoni</i>	Native to Republican and South Platte basins, possibly in Colorado River drainage	Moderately clear tributary streams with sand or gravel bottoms, also in small ponds	No	No
Colorado pikeminnow (FE, ST) <i>Ptychocheilus lucius</i>	Colorado, Dolores, Green, Gunnison, San Juan, White and Yampa	Large, swift-flowing rivers that are seasonally turbid with warm backwaters	No	No
Colorado River cutthroat trout (SGCN) <i>Oncorhynchus clarkii pleuriticus</i>	Widespread localized reaches	Headwater streams and lakes	No	No
Colorado roundtail chub (SGCN) <i>Gila robusta</i>	Colorado River through Glenwood Canyon, downstream on White River, Milk and Divide Creeks	Larger rivers of Colorado River basin	No	No
Common shiner (ST) <i>Luxilus cornutus</i>	South Platte basin	Lakes, rivers and streams, most common in the pools of streams and small rivers	No	No
Flannelmouth sucker (SGCN) <i>Catostomus latipinnis</i>	Western Colorado rivers	Utilizes mid-sized rivers and streams	No	No
Flathead chub (SGCN) <i>Platygobio gracilis</i>	Arkansas River basin	Main branches of turbid streams and rivers, fast currents with sand or gravel substrates	No	No
Greenback cutthroat trout (FT, ST) <i>Oncorhynchus clarkia stomias</i>	Front Range mountain streams, recently on west slope but outside San Miguel drainage	Montane clear, cold streams	No	No
Humpback chub (FE, ST) <i>Gila cypha</i>	Green, Yampa and Colorado Rivers	Pools and eddies in areas of fast-flowing, deep, turbid water, often associated with cliffs and boulders	No	No
Iowa darter (SGCN) <i>Etheostoma exile</i>	Plains rivers	Springs	No	No
Lake chub (SE) <i>Couesius plumbeus</i>	North Platte	Gravel bottomed pools and streams	No	No
Mountain sucker (SGCN) <i>Catostomus platyrhynchus</i>	Numerous small to medium streams below 8600' elevation.	Throughout west on both sides of Continental Divide-prefer clear cold creeks and small to medium rivers with rubble, gravel, or sand substrate	No	No
Northern redbelly dace (SE) <i>Phoxinus eos</i>	South Platte basin	Small slow-flowing streams and connected lakes with vegetation	No	No
Orangespotted sunfish (SGCN) <i>Lepomis humilis</i>	Widespread across middle and eastern U.S.	Shallow silt-laden waters, floodplain pools, backwater pools of larger streams on plains	No	No
Plains orangethroat darter (SGCN) <i>Etheostoma spectabile</i>	Arikaree and Republican River drainages	Small, clear, spring-fed streams with sand, gravel or rocky bottoms and no silt	No	No

Plains minnow (SE) <i>Hybognathus placitus</i>	Arkansas & South Platte basins	Main channels of rivers, also in pools below diversion projects	No	No
Razorback sucker (FE, SE) <i>Xyrauchen texanus</i>	Lower Yampa and lower Colorado Rivers	Deep, clear to turbid waters of large rivers and reservoirs, with silt, mud, or gravel substrate. Quiet, soft-bottom river backwaters	No	No
Rio Grande Chub (SGCN) <i>Gila pandora</i>	Rio Grande basin	Pools and streams with gravel substrate and overhanging banks and brush	No	No
Rio Grande cutthroat trout (SGCN) <i>Oncorhynchus clarkia virginialis</i>	Rio Grande basin	Clear, cold, swift moving creeks and streams in montane environs	No	No
Rio Grande sucker (SE) <i>Catostomas plebeius</i>	Rio Grande basin	Stream obligate using slow moving reaches	No	No
Southern redbelly dace (SE) <i>Phoxinus erythrogaster</i>	Arkansas River basin	small, low-order streams where the habitat includes permanent springs, seeps, and mats of vegetation	No	No
Stonecat (SGCN) <i>Noturus flavus</i>	South Platte and Republican basins	Fast riffles and runs in streams with sand or gravel bottoms with some rocks- found under rocks and debris	No	No
Suckermouth minnow SE) <i>Phenacobuis mirabilis</i>	South Platte and Arkansas River drainages	Shallow, clear riffles with sand and gravel substrates	No	No
REPTILES				
Triploid Checkered whiptail (SGCN) <i>Cnemidophorus neotesselatus</i>	Arkansas drainage in Eastern Colorado	Hillsides, arroyos and canyons associated w/ Arkansas River valley	No	No
Massasagua (SGCN) <i>Sistrurus catenatus</i>	Southeast Colorado below 5,500'	Dry plains grasslands and sandhills	No	No
MOLLUSKS				
Cylindrical papershell (SGCN) <i>Anodontooides ferussacianus</i>	Boulder County	Headwater creeks and streams with silty/muddy substrates	No	No
Rocky Mountain Capshell (SGCN) <i>Acroloxus coloradensis</i>	Rocky Mountains into Canada	8,500 to 10,000' mountain lakes	No	No
Source: CPW 2015 FE = Federally Endangered; FT = Federally Threatened; SE = State Endangered; ST = State Threatened; SGCN = Species of Greatest Conservation Need				