

### III. PRE-DEVELOPMENT SITE CONDITIONS





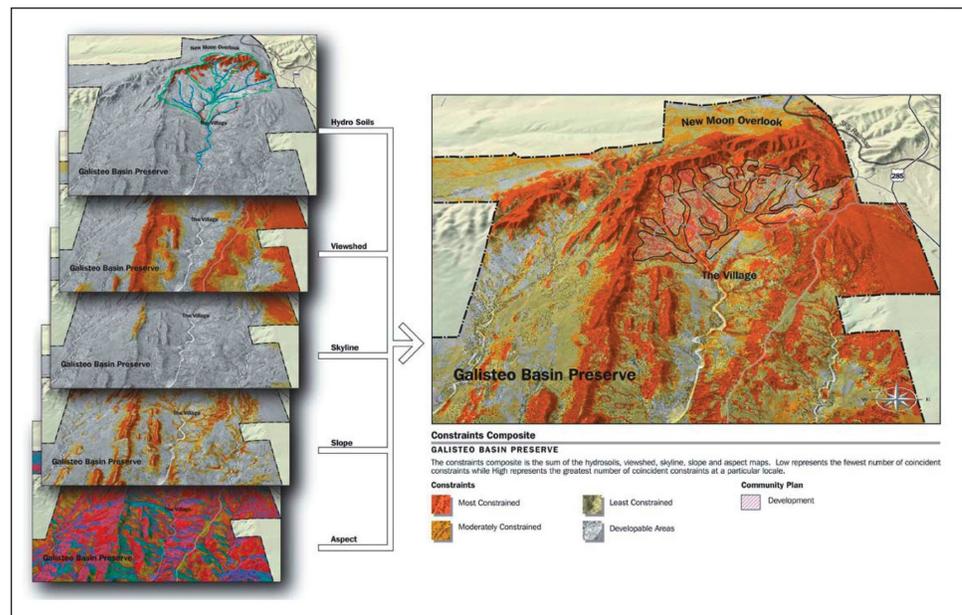
## Pre-Development Overview

Over the last four years, Commonwealth Conservancy has engaged a team of town planners, landscape architects, architects, civil and environmental engineers, archeologists, geologists, and natural resource specialists to prepare a physiographic analysis of the Village development area.

With support from Santa Fe County’s Geographic Information System (GIS) staff, the planning team mapped the slope, solar aspect, soils, surface hydrology, and other geophysical attributes of the Preserve. Employing a “land suitability methodology” first championed by Ian McHarg at the University of Pennsylvania, the Preserve’s physiographic characteristics were first catalogued as GIS data layers and then combined to create an “opportunity and constraints map” of the proposed Village development area. The composite map informed an understanding of the land’s “carrying capacity” for human habitation (see Figure III.A).

Briefly discussed in this section are the pre-existing slope and soil conditions, groundwater resources, and wildlife and cultural resources associated with the Phase I Plat.

**Figure III.A Village Opportunities + Constraints Map**



## Slope Analysis

The Village development area is contained within a well-defined “bowl” that is framed on its northern and western edge by a ridgeline known locally as the Lamy Crest. The eastern boundary of the Village is framed by a hillside that quickly drops 30 to 50 feet from the surrounding Galisteo Basin plain.

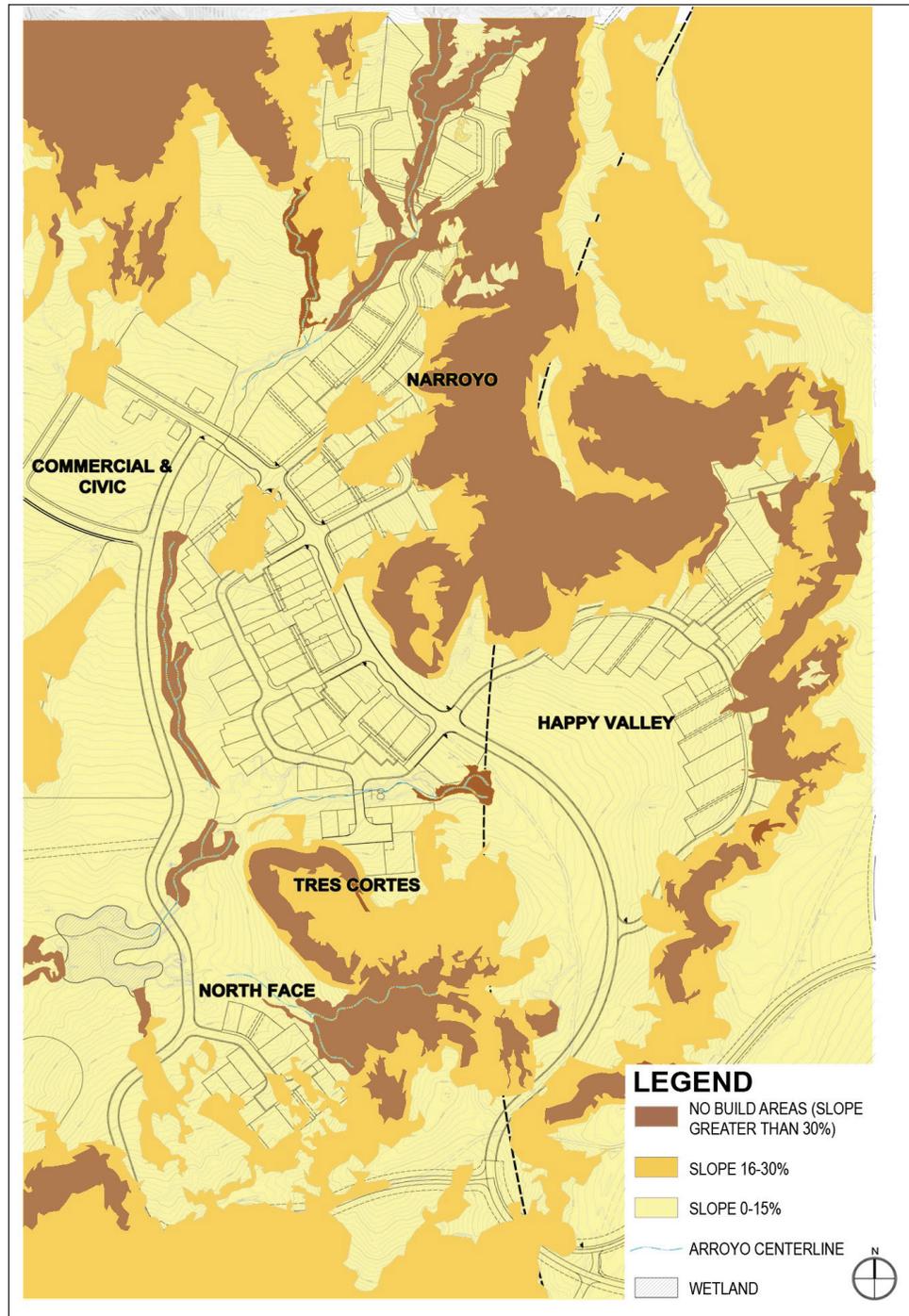
As illustrated in Figure III.B, the Village’s Phase I development envelopes include a series of south-facing sub-basins ranging in size from 2.5 to 8 acres. A deeply incised arroyo, known as La Cañada de Los Angeles, bisects the Village development envelope on a northeast-southwest axis. A series of arroyos and “head-cuts” parse the Village development area into sub-drainages that parallel La Cañada de Los Angeles.

Below the rim of the Lamy Crest, relatively steep slopes predominate (i.e., 10 to 15 percent). In other areas of the Village basin, development envelopes include grades of 2 to 10 percent. The west half of the Village basin is characterized by small rolling hills, open meadows, and rocky knolls. At the southern boundary of the Village basin, the grade is relatively gentle (i.e., 2 to 4 percent).

Pacific Western Technologies, LTD, of Albuquerque, New Mexico, prepared an aerial topographic survey for the site by with a one-foot contour interval. The resulting slope-analysis map identified areas with grades of 0 to 15 percent, 15 to 30 percent, and over 30 percent. Commonweal has used this map to appropriately plat home sites outside of steep-slope areas (see Figure III.B and Sheet Set page S1.01).

Given the south-facing orientation of the site and its relatively gentle slopes associated with the development envelopes, a large percentage of building sites will have good solar access and excellent views to the mountains and grasslands that distinguish the region. All of the Phase I development lots have adequate building areas.

Figure III.B Phase I Slope



## Soil Conditions

The soils associated with the Phase I Plat development are comprised of three main types: the “Panky Series,” the “Travessilla Series,” and the “Pojoaque Series.”

According to the Natural Resource Conservation Service (NRCS) Soil Survey, the soil composition of the Phase I development area includes: Soils #522 — Penistaja family fine sandy loam, 1- to 3-percent slopes; and Soils #524 — Zia-Gullied land complex, 2- to 10-percent slopes. A copy of the NRCS soils map is presented in Figure III.C.

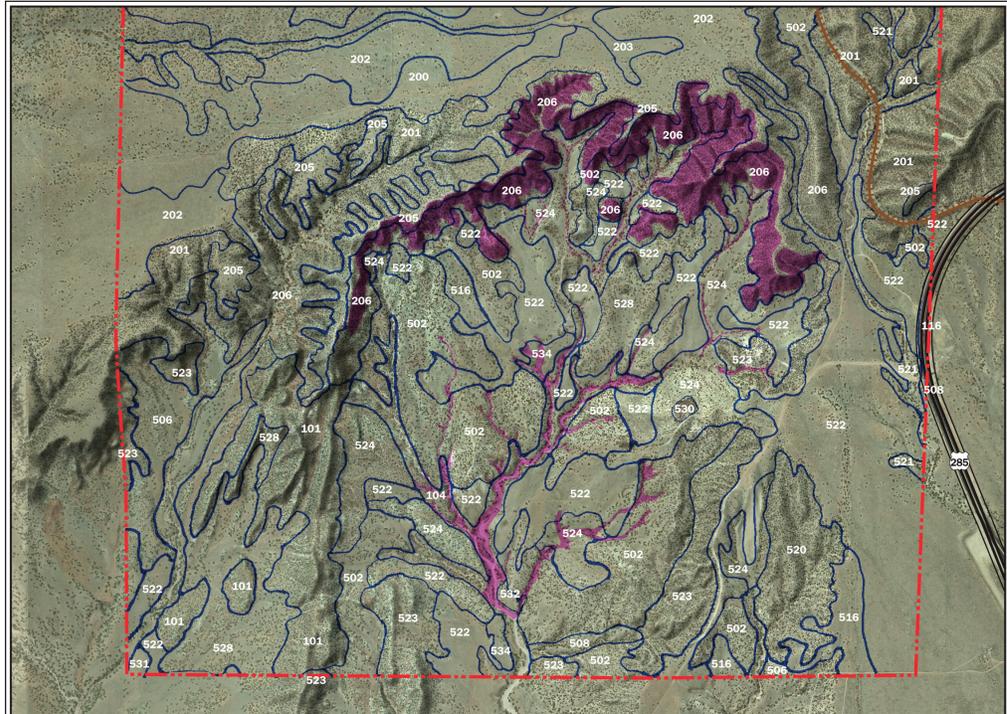
The Penistaja and Zia-Gullied soils are limited by their shrink-swell potential, flooding potential, and slope-caving potential. Correspondingly, there are existing areas of arroyo erosion, incision, and bank collapse within the Phase I development area.

The US Department of Agriculture describes the properties of these soil types as having low to relatively high permeability rates belonging to Hydrologic Soil Group A and B. Group A soils have relatively high infiltration and low runoff rates allowing for more than 0.3 inches of absorption per hour when wet. Group B soils have moderate infiltration and runoff rates allowing between 0.06 and 0.3 inches of absorption per hour when wet.

Based on an available geological map of the area, the geologic units underlying the site are Qtsf and Tps. Qtsf are lower Pleistocene-Pliocene sedimentary rocks derived from river, floodplain, lacustrine, and eoline deposits of the Rio Grande rift basins, including the Santa Fe Group, and older piedmont and alluvial deposits of the Quemado Formation. Tps are Eocene and Paleocene sandstones, mudstones, and conglomerates, including Baca, Galisteo, Blanco Basin, Love Ranch, and San Jose formations.

A more in-depth soils report prepared by Geo-Test of Albuquerque, New Mexico, on December 2006, is presented in the Terrain Management Report and included in the Technical Reports section of this submittal.

Figure III.C Galisteo Basin Preserve Soil Types



**Soil Type**

**GALISTEO BASIN PRESERVE**

Soil Type  
 101 - 206 Hydrological Soil Group A - Restricted Development Areas &  Hydrologic Soil Group A

516 - 534 Hydrological Soil Group B - Possible Development Areas

Base Layers

 Hydrological Soil Assessment Area

 Soil Type Boundary

 Highways

 Railroad

2000 feet 

Source: Natural Resources Conservation Service

## Groundwater Resources

To advise the planning and design of the Village development, a series of hydrological assessments and analyses of the Galisteo Basin Preserve's geological and water resources was prepared by John Shomaker & Associates, Inc. (JSAI). Over a period of three years (2005 to 2007), the staff and scientists of JSAI researched historical reports, geological surveys, and well logs from the Office of the State Engineer (OSE) to guide their water development assessment of the Preserve. Their observations and findings were subsequently tested and affirmed through an analysis of more than six domestic and exploratory wells drilled by Commonweal between 2004 and 2007.

The detailed methodology, analysis, and recommendations of JSAI are included in their "Hydrological Report for the Galisteo Basin Preserve, Santa Fe County, New Mexico," dated September 2006. Following from a review by Santa Fe County staff, the initial report's findings and conclusions were updated and revised during the spring and fall of 2007. A subset of relevant hydrological reports is included in the Technical Reports section of this submittal.

## Geologic Structure

The Galisteo Basin Preserve is situated between the Santa Fe embayment of the Española Basin and the Estancia Basin. The northwestern portion of the Preserve is in the Santa Fe embayment and the remainder of the property is associated with the Galisteo Basin watershed.

Three major faults divide the Preserve: the Lamy fault trending along Galisteo Creek and two "normal faults" that trend north to northwest through the property.

The Preserve is comprised of five geologic units: 1) Quaternary-age sand and gravel deposits, known as the Ancha Formation; 2) extrusive and intrusive volcanic units of the Tertiary-age Espinazo Formation; 3) the Upper Tertiary-age Galisteo Formation; 4) the middle and lower Galisteo Formation; and 5) older bedrock units. Among these formations, the Upper Galisteo Formation is considered the most productive water-bearing geologic structure within the Preserve boundaries.

### Groundwater Directional Flow

Regional groundwater elevation contours of the Galisteo Basin Preserve were derived from an Eldorado model report prepared by Shomaker, et al. (2001). Along the northern boundary of the Preserve, Shomaker determined that there is a groundwater divide that separates the groundwater flow in the Española and Galisteo basins. According to Shomaker, groundwater in the Espinaso and Upper Galisteo formations may have a flow path toward the Española Basin via the Santa Fe embayment. In the area proposed for development of the Village well field, the flow path is westerly.

### Water Quality

Water quality analyses were performed on wells drilled in the New Moon Overlook (a conservation neighborhood located immediately north of the Village), as well as the Village production well No. 1, located ¼ mile west of New Moon Overlook. These tests determined that the groundwater produced from the Espinaso and Galisteo formations is of a good quality (less than 500 mg/L total dissolved solids [TDS]), indicating recent recharge and relatively rapid groundwater circulation. The water from the Lot 18 test well meets drinking-water standards. The Village production well No. 1 was found to contain an excess concentration of fluoride, which will require a modest level of treatment.

### Aquifers + Hydrologic Zones

In their investigation of the hydrologic resources of the Preserve, Shomaker, et al., identified five potential aquifer zones. An aquifer identified as “Zone A” is a subset of a larger aquifer that is comprised of Espinaso and Upper Galisteo Formation geologic units. Zone A encompasses a land area of approximately 460 acres. It is bounded on the east and west by two faults that displace the adjoining geological layers by hundreds of feet.

The geologic profile of Zone A includes a shallow layer of Ancha Formation (0 to 60 feet), overlaid by a moderate unit of Espinaso Formation (61 to 200 feet), both of which overlay a substantial unit of Upper Galisteo Formation (201 to 900 feet).

In 2006 and 2007, Commonweal drilled two exploratory wells within the Zone A aquifer to map the formation, test the hydrological characteristics, assess the storage capacity, and evaluate the water-quality attributes of the aquifer. In this investigation, two 96-hour pump tests were conducted to determine the flow and recharge characteristics of the aquifer.

After careful review by the Santa Fe Water Resources Division and the county hydrologist, the Zone A aquifer of the Galisteo Basin Preserve was judged suitable in quality and sufficient in its storage capacity to serve the 100-year domestic water needs of the initial phase of Village development.

## Plant + Wildlife Resources

The Galisteo Basin Preserve is a vibrant landscape of dry savannah grasslands, piñon-juniper woodland, and arroyo-riparian plant communities. The Preserve offers forage and vegetative cover that sustain a rich population of mammals, birds, reptiles, and insects. Its rocky cliffs, grasses, braided drainages, small wetlands, cottonwood bosque, springs, and seeps support diverse microclimates and ecological zones.

Four vegetation types occur within the Phase I development envelope: juniper savanna, coniferous woodland, plains-mesa grassland, and arroyo riparian. A total of 89 species of vascular plants representing 28 families also exist in the Phase I development area. In their biological review of the site, Albuquerque-based Marron and Associates scientists observed no Class A, B, or C noxious weeds. None of the plant species found during the preliminary biological survey is considered rare or unique.

The most common plants within the Phase I development area, aside from juniper and piñon trees, are blue grama, three awn snakeweed, and cane cholla. Although drought conditions in 2001 to 2003 killed a large number of piñon trees within the Phase I development area, it is interesting to note that the piñon loss is measurably less than in surrounding areas of Santa Fe. According to Marron and Associates, the relative strength of the piñon population may be indicative of a reasonably productive shallow aquifer.

By limiting the community's development footprint — and by establishing generous conservation buffers along drainages and slopes — the Village is designed to showcase an integrative practice of community stewardship, one in which human and wildlife health are mutually reinforcing. Within the Village, a variety of native plants and water sources will be established to attract and sustain wildlife populations that, heretofore, have been unable to survive in this semi-arid, food- and water-deficient landscape.

Notwithstanding the long-term stewardship plan for the project, the Village development will impact vegetation, vertebrate, and invertebrate habitat within the 100-acre development envelope of the Phase I Plat, as well as along trail corridors in the larger Preserve. The habitat change will be most pronounced for small mammals and reptiles.



During construction, resident populations of birds, mammals and reptiles will likely be displaced due to noise, odors, and vehicular traffic. Except for larger mammals, many existing resident species can be expected to repopulate the Village after the disturbance is complete.

To enhance the size and diversity of habitat within and adjacent to the Village, Commonweal has engaged a number of local environmental organizations and professional consultants to advise its work. With revenues from lot and home sales, the Preserve's nonprofit Community Stewardship Organization (CSO) will oversee the planning, design, and implementation of habitat restoration projects. The Preserve CSO will also coordinate environmental education and food and agriculture programs within the Preserve. (More information about the CSO is presented in the Community

Operating Agreement included in the Technical Reports section of this submittal.)

Within the Village development zone, the most substantial investment of energy and money will be directed to riparian corridor regeneration. Utilizing low impact design (LID) and ecological design technologies and strategies, Commonweal will reshape the surface hydrology of the Preserve to slow the flow of water during rain and snow melt events. Reducing the velocity of storm-water flows and improving the soil's absorptive capabilities will measurably enhance the storage capacity of Preserve's shallow aquifers. Higher moisture content in the soil will enhance root

growth among trees and grasses that will, in turn, improve the density and diversity of habitat within the Preserve.

Please see the “Village at Galisteo Basin Preserve Biology Report,” prepared by Marron and Associates, as well as an updated letter to the report concerning the Phase I Plat, prepared by report author Paul Knight, in the Technical Reports section of this submittal.

## Cultural Resources

To minimize disturbance to the region’s archaeological and cultural resources, Commonweal engaged the Rio Grande Foundation for Communities and Cultural Landscapes (hereafter, “Rio Grande Foundation”) to complete a phased archaeological survey of the Village at the Galisteo Basin Preserve. The surveys were conducted between 2005 and 2007. See the “Archaeological Survey of the Galisteo Basin Preserve” and related addendums in the Technical Reports section of this submittal.

The Rio Grande Foundation surveyed the development envelopes, roadways, utility corridors, and trails associated with the proposed 300-acre Village development envelope. Although most of the Village site did not contain archaeological remains, the multi-year survey identified a number of contributing and significant cultural sites.



The majority of the recorded sites were pre-Columbian in age. Pre-Columbian sites represent portions of the Archaic through the Classic periods (ca 5000 BC to AD 1400s). Most of the sites involved scatters of flaked stone manufacturing debris, grinding stones, and/or pottery sherds that lack thermal features (i.e., features caused by fire pits or roasting pits). The sites probably represent localities where small groups of people, possibly extended families, performed various tasks such as food processing and tool making. Artifact scatters date to the Coalition Period, the Late Coalition through the early Classic periods, and the Classic period.

There is no evidence of permanent habitation in the Phase I development area. Overall, the proposed Village development area seems to have been a place of transitory and opportunistic use.

By this submittal, Commonweal warrants that no significant cultural resources will be adversely affected by the development and settlement of the Village. Prior to plat recording, Commonweal will draft preservation easements and establish buffer zones around “significant” or “potentially significant” sites to minimize the risk of development impacts.

In addition to traditional conservation-easement and site-avoidance strategies, Commonweal is collaborating with the Earthworks Institute of Santa Fe to establish a nonprofit Community Stewardship Organization (CSO) to oversee the permanent protection of the Preserve’s significant archaeological resources. The nonprofit affiliate will be responsible for protecting Village cultural-resource sites as well as stewarding the 12,000 acres of Preserve open space. Charter School 37 students and teachers will also serve as researchers and interpreters of the Galisteo Basin Preserve’s unique and fragile historic resources.