ARROYO ASSESSMENT SURVEYS OF 10 MAJOR ARROYOS IN THE SANTA FE WATERSHED

November 16th, 2012

Santa Fe Watershed Association

Report to the Public Works Department, City of Santa Fe 2012

Overview

There are hundreds of miles of arroyos within the Santa Fe River Watershed. They are used recreationally, roads and trails criss-cross them, utility lines run through them, and by nature they are highly erodible. With the increase in severity of summer rainstorms combined with a larger population and thus, greater use, these arroyos have a large impact on the City of Santa Fe infrastructure. As we are learning, they require attention and maintenance. Additionally, proper care emphasizing specific measures to help control erosion, slow down storm-water, spread it across a broader area, and promote its absorption into the ground can add to the City of Santa Fe's longer-term water security by capturing more water from rainfall, helping to recharge aquifers, and promote greater ecological health. Slowing the erosion will also help protect municipal infrastructure such as electrical lines, sewage lines, etc…which in turn protects public safety.

Between August 14th – October 3rd, 2012, Santa Fe Watershed Association staff conducted assessments on ten different arroyo systems within the boundaries of the City of Santa Fe. The City of Santa Fe Public Works Division requested this assessment in order to identify high priority areas for infrastructure repair as a part of the General Obligation Bonds funding dedicated to arroyo maintenance and repair.

Staff walked approximately 50 miles armed with a GPS camera and data sheets. The assessments examined the arroyos for erosion and decay in two primary areas: Infrastructure Risks (where erosive conditions are causing a risk to the general public or to Municipal infrastructure) and Channel Characteristics (areas of concern where continued erosion could endanger both public and private property assets). Specifically, Infrastructure Risks looked at: Trail deterioration (if there was a trail running along an arroyo), bank deterioration, damaged and restricted culverts, endangered utility lines (such as electrical, water, sewer), foot/bicycle/vehicle bridge damage. Channel characteristics were evaluated according to the following: Incised, incised & braided, constricted, collapsed banks, vertical banks, or deteriorating rip rap. A scoring system of 1-4, 1 being the worst, 4 being the best, was applied. Other observations were noted and photographs were taken so that each situation could be mapped and referred to easily by City staff. The scores of each reach were recorded and tabulated. The data sheets for each reach are in Appendix A.

Included in the study were the following:

Arroyo Cabra (Cristo Rey Area)
Arroyo de la Piedra – 2 Forks
Arroyo de los Chamisos
Arroyo en Medio
Arroyo Mascaras
Arroyo Mora
Arroyo Rosario
Arroyo Saiz
Canada Ancha
Arroyo de los Pinos

The report also includes a chart of the scores that each arroyo received. The lower the score, the higher priority the arroyo reach. The highest priority reaches are emphasized with a white background. Please refer to the notes for greater detail on the identifying problems.

A map identifying the location of the highest priority reaches is in Appendix B.

Like all natural environments inhabited by humans, these high-priority reaches require well-designed restorative actions to help stabilize, protect, and secure the infrastructure that runs through them.

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Appendix A — Arroyo Data Sheets

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Arroyo Name	Segment Location, Upstream	Segment Location,Downstream	Cost Including Design	Basin Size	Infrastructure Damage/Risk	Channel Character,Drainage
1.A Arroyo de los Chamisos	approx.800' upstream of Santa Fe Trail	Old Santa Fe Trail Bridge			**2.41**	**2.5**
1.B Arroyo de los Chamisos	Old Santa Fe Trail Bridge	Conejo Rd.Crossing			**2.8**	**2.25**
1.C Arroyo de los Chamisos	Conejo Rd.	St. Francis Dr. Bridge Crossing			**2.5**	**2**
1.D Arroyo de los Chamisos	St. Francis Drive	Yucca St Bridge Crossing	**500,000**	**3**	**1.1**	**0.66**
1.E Arroyo de los Chamisos	Santa Fe Highschool	Camino Carlos Rey Bridge			**2.8**	**2.3**
1.F Arroyo de los Chamisos	Camino Carlos Rey Bridge	Ave de las Campanas Bridge			**3**	**2**
1.G Arroyo de los Chamisos	Ave de las Campanas Bridge	Rodeo Rd Bridge			**2.3**	**1.8**
1.H Arroyo de los Chamisos	Rodeo Rd Bridge	Governor Miles Bridge - End			**2.3**	**2.66**
2. Arroyo Rosario	Headwaters	Paseo De Peralta	**50,000**	**1**	**1.9**	**2.3**
3. Arroyo Saiz	Headwaters	Confluence with Santa Fe River	**50,000**	**1**	**2**	**1.25**
4. Arroyo Mora (Upper Canyon Road)	South of Calle Militar	Confluence with Santa Fe River	**25,000**	**1**	**2.5**	**2**
5. Arroyo Cabra (Cristo Rey Area)	Apodaca Hill	Confluence with Santa Fe River	**50,000**	1	**2.8**	**1.5**
6.A Arroyo en Medio	Old Santa Fe Trail Bridge	Old Las Vegas Hwy			**2.9**	**2.3**
6.B Arroyo en Medio	Old Las Vegas Hwy	Old Pecos Trail Bridge			**2.9**	**2.5**
6.C Arroyo en Medio	Old Pecos Trail Bridge	Rodeo Road Bridge	**150,000**	**2**	**3**	**2**
6.D Arroyo en Medio	Rodeo Road Bridge	Sawmill Drive			**2.3**	**2**
6.E Arroyo en Medio	Sawmill Drive	St.Francis Drive Bridge Crossing			**2**	**1.75**
7.A Canada Ancha	Headwaters Near 10,000 Waves Spa	Canada Sur	**500,000**	**1**	**2**	**2**
7.B Canada Ancha	Canada Sur	Confluence with Santa Fe River			**0**	**1.75**
8. Arroyo de los Pinos *Upper A*	Galisteo	Camino Corrales near Lejo Rd.			**2.5**	**2**
8. Arroyo de los Pinos *Upper B*	Don Gaspar	Camino Corrales near Lejano Rd.			**2.8**	**2**
8.A Arroyo de los Pinos	Galisteo	St. Francis Dr.			**2.3**	**2.3**
8.B Arroyo de los Pinos	St. Francis Drive	6th Street	**25,000**	**3**	**2**	**2.3**
8.C Arroyo de los Pinos	St.Michaels Dr.	Camino Carlos Rey Bridge			**2.3**	**1.62**
8.D Arroyo de los Pinos	Camino Carlos Rey Bridge	Richards			**2**	**1.4**
8.E Arroyo de los Pinos	Richards	Confluence with Arroyo de los Chamisos			**2**	**1.1**
8.X Arroyo de los Pinos	Parallel to La Farge Library	St. Michaels Dr.			**2.67**	**2.5**
9. Arroyo Mascaras	Bishops Lodge Road	Confluence with Santa Fe River	**50,000**	**3**	**3**	**2.5**
10. A Arroyo de la Piedra East Fork	Above Brownell Holland	Converges with the West Fork	**100,000**	**1**	**2**	**1.5**
10. B Arroyo de la Piedra West Fork	confluence with Arroyo Mascaras/ Santa Fe River	Headwaters			**2**	**1.75**
Graded Scoring System					**A = 4.0 C = 2.0**	**B = 3.0 D = 1.0 F = 0.0**

Arroyo City-wide Watershed and Arroyo Projects

I. Arroyo de los Chamisos

Segment A. Approx. 800 ft. upstream from the Old Santa Fe Trail Bridge

Notes: The character of the arroyo is that of a wide and braided channel. Despite the broadness of the arroyo, vertical banks, collapsing banks, and eroded areas are common. The constricted area is in close proximity to the Old Santa Fe Trail Bridge. An exposed metal pipe spans part of the arroyo upstream from the bridge. Along a cut bank, downstream from the pipe, is a manhole. It is approximately 10-12" from the edge of the arroyo. **Monitor this utility.** An old dumpsite lies beneath the building of the Carmelite Sanctuary. This segment of the channel ends at the graffiti covered Old Santa Fe Trail Bridge. Erosion is occurring around the edges of the bridge. The entire segment is well traveled by foot. Owing to the proximity of the mountains this area provides a suitable habitat for wildlife.

Exposed utility line in bed of Arroyo de los Chamisos, Segment A.

Segment B. Old Santa Fe Trail Bridge Crossing to the Conejo Road Crossing.

Notes: The upper arroyo channel is broad and moderately braided. The arroyo is well suited for wildlife due to fewer homes in the area. Rabbits, lizards and birds were sighted throughout the arroyo. The upper part of the arroyo is free of trail deterioration, exposed sewage lines, and deteriorating vehicle bridges. However a small fence surrounds two standpipes protruding vertically from the ground. Near this area is a stand of cotton wood trees growing vigorously. Constriction of the arroyo followed by more serious erosion problems begin further downstream in Segment B. Downstream, past the constricted area, there is severe bank deterioration causing damage to private property. The walls are collapsing vertically damaging the fenced-in area of the property as well as exposing old cable lines. Rip-rap has been used near these areas to stem erosion. Walkers, bikers, and joggers use this area heavily. Conejo Road crosses the arroyo.

Private property eroding with exposed cables in Arroyo de los Chamisos, Segment B.

Segment C. Conejo Road to the St. Francis Bridge Crossing.

Notes: This segment of the arroyo continues to be heavily traveled by joggers, walkers, and bikers. After it flows across the road, the arroyo branches to the left and right, later reconnecting downstream. Concrete, burms, and rip-rap are used for erosion control. Before the Calle Sebastian Bridge the incised arroyo narrows and passes under the bridge, over rip-rap and a submerged gabion on its way to the Old Pecos Trail Bridge. A manhole is threatened by erosion. There is moderate bank deterioration after it passes beneath the Calle Sebastian Bridge**.**

First, the arroyo bed passes under the graffiti-covered Old Pecos Trail Bridge, over a concrete spillway and into a small riparian habitat of willow and cottonwood. After the arroyo travels down the spillway, more instances of bank erosion arise within the channel. **This erosion is severe posing a future threat to sewage systems. Continuing downstream the channel is in various states of erosion from moderate to severe. High banks, collapsed walls, and deep incisions occur throughout the channel. The erosion also threatens mature trees living along the arroyo banks.**

Next, the Old Arroyo Chamisos Road crosses the channel. The arroyo continues in the direction of the Botulph Bridge crossing. A common sight along this part of Segment C is the type of creative efforts local residents have used to stave off erosion. Beneath the Botulph Bridge there are large deposits of sediment.

Finally, Botulph Road Bridge crosses the arroyo where its channel widens. The channel passes along walls of gabion towards the first footbridge on the Gail Ryba Trail where erosion is occurring beneath the footing this bridge. After meandering under this bridge the arroyo flows under the second bridge of the Gail Ryba Trail until Segment C ends at the Saint Francis Bridge crossing. Segment C seems to have no exposed utilities, damaged culverts, or deteriorating vehicle bridges.

High, vertical, collapsing banks typical of the upper section of Segment C in the Arroyo de los Chamisos.

High levels of sediment under Botulph Bridge in Segment C of Arroyo de los Chamisos.

Bank erosion behind Capshaw School in Segment C of Arroyo de los Chamisos.

Segment.D St. Francis Bridge to the Yucca Street Bridge Crossing.

Notes: Poor drainage along with erosion control has impacted this segment severely. The extreme deterioration from St. Francis onwards has created hazardous conditions for the community. There is a high frequency of incised channels, constrictions, collapsed banks, and banks in danger of collapsing located within a densely populated area. Established trails, banks, and culverts, concrete footings for vehicle bridges and sewage lines are in extreme need of repair. **Segment D of Arroyo de los Chamisos is a high -risk area in much need of remediation. Immediate corrective action is recommended.**

High vertical walls typical of Segment D in the Arroyo de los Chamisos below the St. Francis Bridge.

Erosion, collapsing banks and undercut bridge footings are a common sight in Segment D of the Arroyo de los Chamisos .

Exposed utilities exist parallel to the Arroyo de los Chamisos Trail in Segment D.

Segment E. Yucca Street Bridge Crossing to the Carlos Camino Rey Bridge

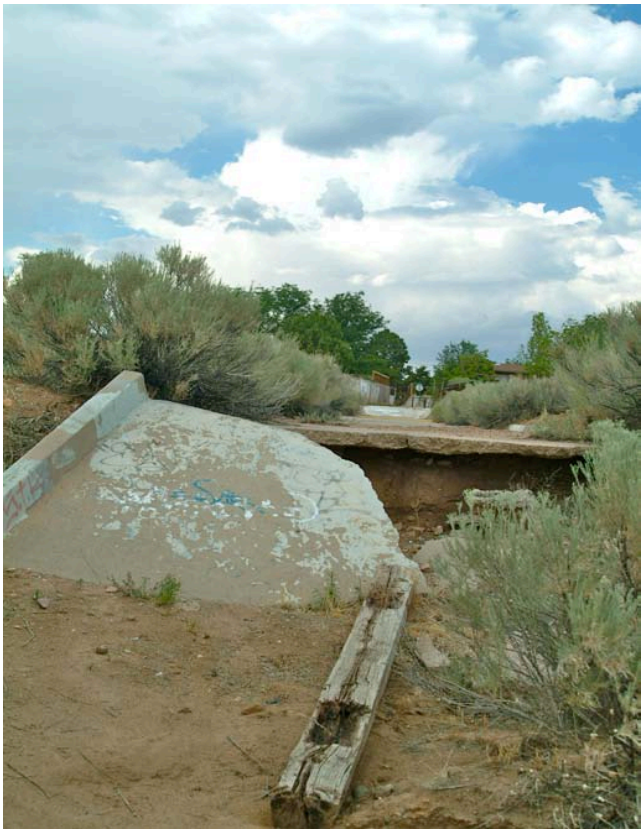
Notes: The channel character of the arroyo is broad in this area. There are places along the banks that are severely eroded. The sheathing protecting the banks of the arroyo is even deteriorating.

Severe bank erosion encroaches on the Arroyo de la Chamisos Trail creating hazardous conditions in Segment E.

Segment F. Camino Carlos Rey Bridge Crossing to the Ave de Las Campanas Bridge

Notes: The arroyo continues to be broad in nature maintaining this character to Governor Miles Road. Below the Camino Carlos Rey Bridge the rip-rap has severely deteriorated. Also a concrete outfall has been severely damaged. The Ave de Las Campana Bridge suffers from large deposits of sedimentation.

Rip – rap torn away from entire length of an outfall below Camino Carlos Rey Bridge crossing the Arroyo de los Chamisos in Segment F.



A broken outfall beside the Arroyo de los Chamisos Trail in Segment F.

Sediment accumulation under the Ave de la Campana Bridge in the Arroyo de los Chamisos, Segment F.

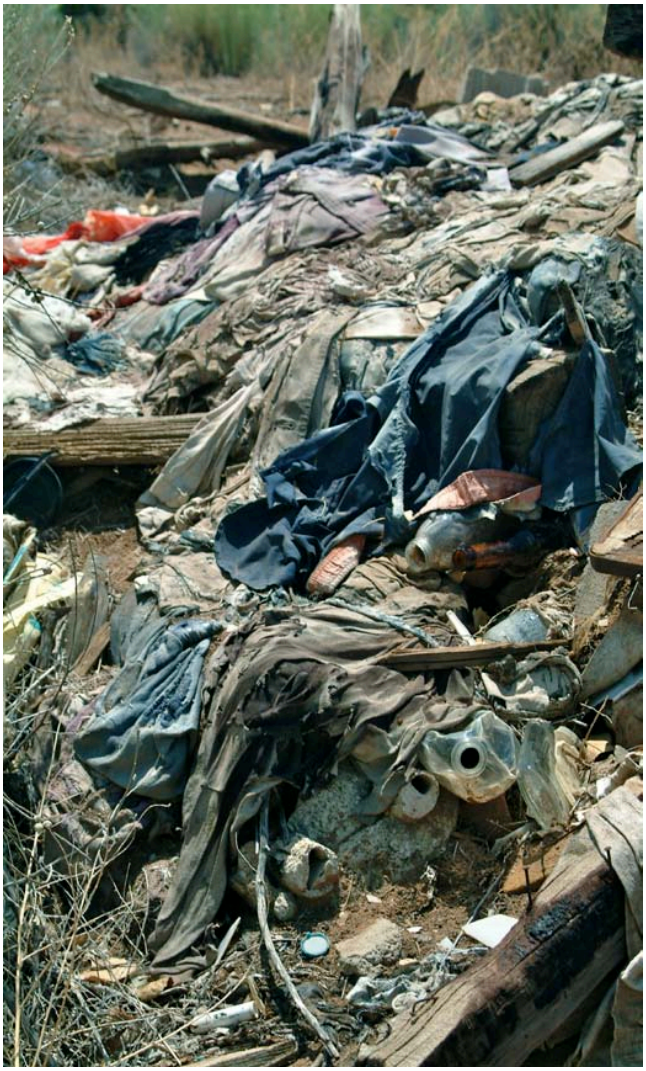
Segment G. Ave de Las Campanas Bridge Crossing to Rodeo Road Bridge

Notes: Between the Ave de Las Campanas Bridge and the Rodeo Road Bridge several high cut banks exist that are **seriously threatening** a residential road near the Kachina Heights subdivision. The rip-rap used to stabilize the arroyo banks is undercut. **Extreme amounts of trash exist in this area.**

High vertical walls with collapsing banks in Kachina Heights overlook Arroyo de los Chamisos, Segment G

Segment H. Rodeo Road Bridge crossing to Governor Miles Bridge

Notes: Along this stretch the arroyo is heavily used by off road vehicles. Evidence of this occurs from the second footbridge of the Arroyo de los Chamisos Trail to Governor Miles Bridge. There is undercutting beneath one of the footbridges along the trail. Nine roads into the arroyo exist. **A great amount of sediment is retained beneath the Auto park bridge.** Up and down this stretch of arroyo there are multiple dumps and loose garbage littering the arroyo. There is also an exposed utility line on top of the Governor Miles Bridge.



One of five dumps located along the Arroyo de los Chamisos, Segment H.

II. Arroyo Rosario

Notes: Approximately near the headwaters of Arroyo Rosario the channel characteristics are variable. Incised, braided, or constricted banks are fairly common. Occasional collapsed banks or vertical banks are in this area. Rip-rap does not exist in this particular location.

The extreme pattern of erosion diminishes near St. Catherine's School to the arroyo's end at the Paseo de Peralta Bridge. Under the Griffin Street crossing the 3 culverts beneath it are severely damaged. They are also retaining large sediment deposits. Just beyond the culverts there is also an **exposed electrical utility** near the gas line marker. The electrical lines are poorly protected beneath a plastic pipe. Further on in a segment of a stone rip-rap encased wall a section of rip-rap is missing. Rocks are beginning to tumble out of the wall ensuring a future collapse. The bridge at Paseo de Peralta is a sediment trap. Trash accumulation rises between Griffin Street and the Paseo de Peralta Bridge. Well worn trails frequent the area revealing the arroyos importance as a passive recreational use area. This arroyo has been documented with the GIS camera. (All the arroyos except Arroyo Chamisos have been documented with this camera.)

The Griffin Street culverts in Arroyo Rosario.

Exposed utility line found in the Arroyo Rosario.

III. Arroyo Saiz

Notes: Arroyo Saiz begins at the intersection of Gonzales and Bishop's Lodge Road. This arroyo is a network of incised drainages running both parallel and opposite of the Bishop's Lodge Road. Storm water run-off into the arroyo is causing severe damage to both the arroyo banks and roadside banks. The increased erosion of the road's shoulders due to poor drainage control will soon bring on future repairs to Bishop's Lodge Road. Meanwhile before repairs are made a motorist could be endangered when pulling off on the shoulder in this location. There are many old rip-rap structures in these tributaries that are in disrepair. Passive recreational trails begin here continuing through other areas of the arroyo. These are heavily traveled by area residents.

Beyond the incised section of the arroyo its channel widens. Before arriving at the Avenida Primavera crossing the arroyo is thriving with willows and cottonwoods. Here, a good to moderate riparian zone has been established. The channel among the riparian zone is slightly incised and braided. There is also an exposed utility pipe in this area.

Below the Avenida Primavera crossing the Arroyo Saiz passes through the City Storm Water Infiltration Gardens. **The public stairway for these gardens is severely damaged and could be hazardous.** The arroyo below the gardens soon transforms into a constricted, incised, and vertical channel.

The arroyo then drops down into the Lorenzo Road area. The existing culverts and bridges are congested with silt. The arroyo becomes constricted as it passes behind homes. An electrical line coming from a home is exposed in this area.

An exposed pipe in Arroyo Saiz.

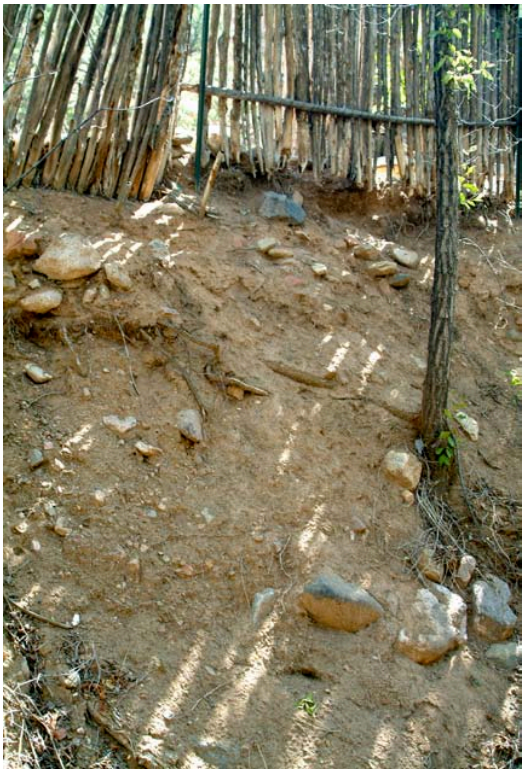
A silt clogged culvert in Arroyo Saiz.

IV. Arroyo Mora

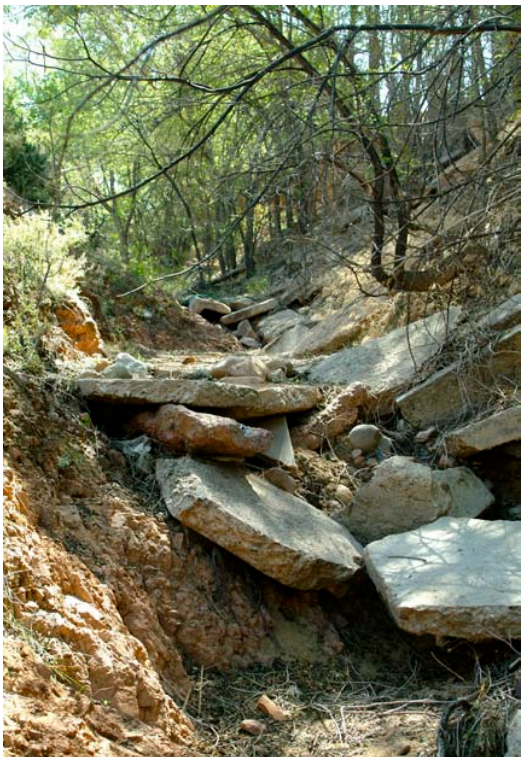
Notes: Starting at the confluence of the Santa Fe River, the Arroyo Mora is a narrow, willow inhabited channel. A culvert along the way is causing bank erosion. The arroyo widens dramatically as it nears the Canyon Road Bridge crossing. An ancient outfall made of stone is crumbling on the far left side creating some incision to the arroyo. When the arroyo passes beneath the Canyon Road Bridge an exposed utility line emerges from the arroyo bed. Beyond the bridge the arroyo channel narrows again. There are dumps along the steep hillsides of the Arroyo Mora. Large amounts of concrete slabs fill this narrow section of the arroyo. Beyond the concrete choked channel the arroyo reopens into a grove of willows.

The inspection of Arroyo Mora was not completed because the channel had been fenced.

Pipe in the bed of the Arroyo Mora.



Endangered fence line in the Arroyo Mora.



Concrete clogged channel of the Arroyo Mora.

V. Arroyo Cabra

Notes: The Arroyo Cabra's confluence with the Santa Fe River is similar in character to the Arroyo Mora. In the arroyo channel several areas of rip-rap are found broken in places. The channel up to the Canyon Road Bridge crossing is in good shape. On the other side of the bridge there is a damaged riprap basket below a culvert. The arroyo narrows as it continues upstream, the channel bed becomes rocky and steep. Trash can be found in large amounts throughout this area. A fork appears in the incised and braided arroyo bed. The Arroyo Cabra study ended just above the Apodaca Hill area.

Damaged rip – rap with trash in Arroyo Cabra.

Obstructed culvert in Arroyo Cabra.

VI. Arroyo en Medio

Notes: *5 segments for this Arroyo were designated using bridge crossings as boundaries.*

Segment A. Old Santa Fe Trail to the Old Las Vegas Hwy. Bridge

The headwaters of this segment are in poor condition. A heavily incised channel passes around a utility pole. There is potential for damage occurring to the utility pole as it sits on a small island. **Monitor pole.** Behind the Quail Run golf course the chamisa covered channel widens. The arroyo bed is moderately incised and braided. Most of this segment is in good condition. Towards the end of the segment nearing Old Pecos Trail Bridge, the arroyo is covered in gabion baskets and mats to control erosion.

Erosion in Arroyo en Medio, Segment A.

Segment B. Old Las Vegas Hwy. Bridge to the Old Pecos Trail Bridge.

Segment B of Arroyo en Medio is in good condition. Few problems were noted.

Segment C. Old Pecos Trail Bridge to the Rodeo Road Bridge

This segment is in good condition. However, above the entrance to the Old Pecos Trail Bridge the bank is in poor condition due to failure of ancient riprap. Heavy erosion is threatening the shoulder of the bridge. **City utility crew needs to asses immediately . A possible motorist hazard exists here.**

Erosion of shoulder off Old Pecos Trail Road, Segment C.

Segment D. Rodeo Road Bridge to Sawmill Drive

The character of Segment D starts as a decent channel leading into areas troubled by erosion. A collapsed area within the Arroyo en Medio bed contains walls up to 7 feet high. The arroyo appears to be one long constriction as it travels parallel to Rodeo Road. Erosion is affecting the condition of culverts, rip-rap and out falls.

Erosion undercutting rip-rap, banks, and concrete outfall in Arroyo en Medio, Segment D.

Segment E. Sawmill Drive to St. Francis Road Bridge

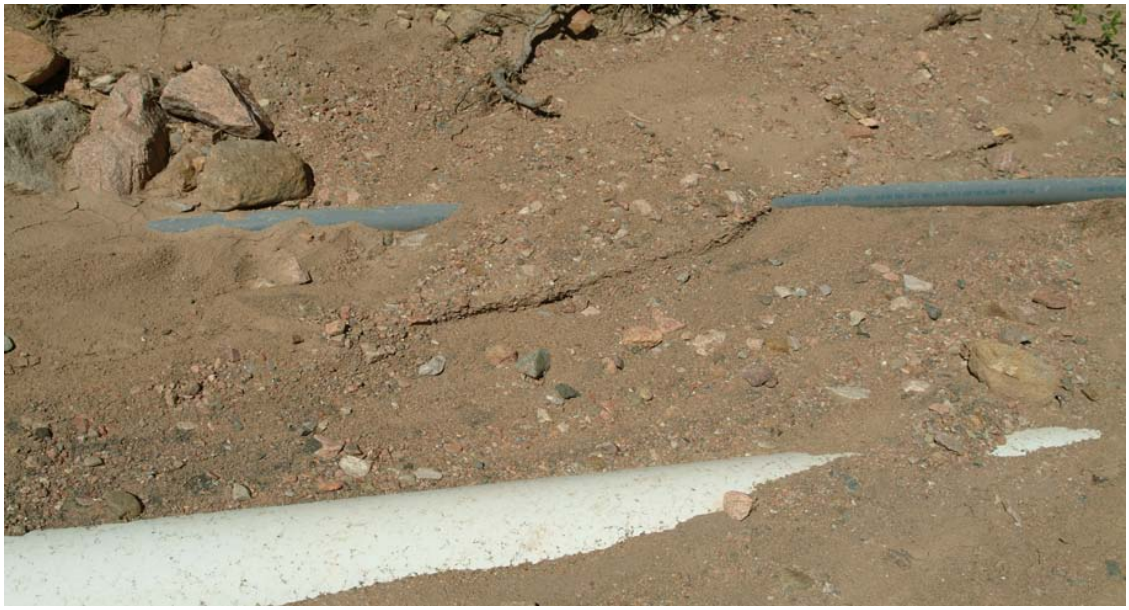
The condition of this segment is among the poorest in all of the Arroyo en Medio. The extent of erosion has created damage to the surrounding infrastructure. It has uncovered one utility line, caused a culvert to emerge out of a vertical bank, collapsed a wall, and incised the bank along side a gabion wall and concrete crossing. The extensive amount of trash and dog waste is problematic in this area .

Pipe and culvert in the Arroyo en Medio, Segment E.

VII. Arroyo Ancha

Segment A. Headwaters – Cañada Sur

Segment A of Arroyo Ancha parallels Hyde Park Road.
A shallow, yet, incised channel describes the beginning of Arroyo Ancha. As it continues it can be characterized as a constricted and incised channel as it enters the La Entrada Area and beyond. In this area and onward there appears to be a heavily used foot/bike path.
Near Kachina Heights Drive, filled in culverts were noted, a smashed gabion, and a large black cable was exposed. The cable is in the arroyo bed itself.Below the Cerros Colorados entrance **the condition of the arroyo is very poor due to extreme erosion. There are manholes above ground, two instances of exposed high voltage cables, one in the bed of the arroyo, the other in the bank, two types of utilities are exposed in the bed of the arroyo, culverts are obstructed by silt and one culvert is damaged. Corrective actions to protect infrastructure are strongly recommended and may be urgent. Power lines should be inspected as soon as possible . Foot and bike traffic is high in this area.**



Two exposed pipes in Arroyo Ancha, Segment A.

High voltage cables (top), utility line(middle), sewer utility (bottom), in Arroyo Ancha, Segment A.

Segment B. Cañada Sur – Santa Fe River

Segment B of Cañada Sur is highly traveled by foot. The arroyo parallels Hyde Park Road until it crosses Dempsey Lane where it changes direction to parallel Gonzales Road. The channel characteristics are variable in this arroyo. The channel is braided in places, constricted in others, banks become vertical, high banks are collapsing, while other areas are open and broad.

The arroyo's drainage is wearing on infrastructure and private property, footings around box culverts are undercut, rip-rap is in disrepair, the footings of a private fence line are eroding from the bank, erosion is occurring around a concrete out fall, and a manhole.

Above the Lejano Bridge crossing, **a cable and a large pipeline were found exposed in the bed of the arroyo.** A fence line is in danger of collapse along the bottom of Lorenzo Road. When entering the arroyo on the other side of Lorenzo Road erosion has undermined the rip-rap structures and created a vertical wall between the outfall and gabion wall. The silt levels of the box culvert emptying into the river are very high.

Undercut bridge footing in Arroyo Ancha, Segment B.

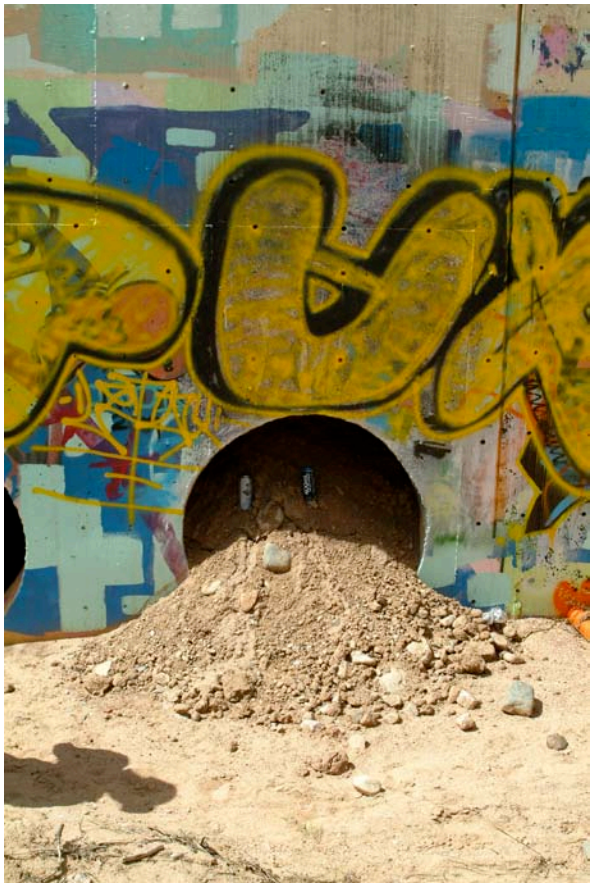
Box culvert trapping sediment beneath E. Alemeda Street, Arroyo Ancha Segment B.

VIII. Upper Arroyo de los Pinos

Subdivided into segments because of Arroyo de los Pinos' fragmented nature.

Segment A. Camino Corrales /Lejo to Galisteo -North Fork

Unlike the lower channel of the Arroyo de los Pinos, the upper channel characteristics are various. Different points in the arroyo can be constricted and braided, or open and braided. This upper branch passes under or over many roads. (Seville, Don Gaspar, Galisteo) A walking/ biking trail exists in the arroyo ending at Old Pecos Trail. A permanent trail, built for the Santa Fe Botanical Gardens, also parallels the arroyo up to Old Pecos Trail. The infrastructure along this trail seems to be in good repair. There is a clogged culvert at Old Pecos Trail. Trash levels are significantly lower along this branch.



A clogged culvert at Old Pecos Trail, Upper Arroyo Pinos, Segment A.

Plugged culvert near Old Pecos Trail in Arroyo Pinos, Segment A.

Segment: B. Camino Corrales /Lejano to Don Gaspar South Fork

The two upper branches of Arroyo de los Pinos converge near Don Gaspar. Again the channel character varies. A walking trail in the arroyo exists until it meets Old Pecos Trail. Another one exists from Madrid Street to Don Gaspar. Along this branch rip-rap is often encountered. Infrastructure along this path seems to suffer from eroded materials blocking culverts. Several areas in both segment A and B flow into groves of young elm trees causing foot passage to be difficult.
Trash accumulation is present but not severe.

Obstructed culverts in Upper Arroyo Pinos, Segment B.

Lower Arroyo de los Pinos

Segment A. Galisteo Street to St. Francis Drive

Arroyo de los Pinos flows out of the Galisteo Street culverts into a wide, heavily wooded area. After traveling beneath the trees the arroyo transforms into a long narrow constricted run to St. Francis Drive. The impacts from erosion are high to moderate, more so after passing beneath Luisa Sreet and nearing St. Francis Drive. A path appears from Galisteo Street to Luisa. Pedestrians and bicyclists use the bank of the arroyo as a recreational path. In the future, a recreational path could be connected to the path near Second Street Brewery.

Rip-rap, outfalls, both concrete and basket type, in various conditions are placed throughout the arroyo. Culverts with varying degrees of obstructions occur along this segment. **One utility line pipe has eroded from the bed of the arroyo. Another utility in distress is an above - ground manhole whose outer concrete casing is crumbling.**

Disrepair encountered in the Lower Arroyo de Pinos, Segment A.

Segment B. St.Francis Drive to 6th Street

Arroyo de los Pinos flows beside residential and commercial buildings. The arroyo segment begins at the St. Francis culverts where water has incised and undercut some banks severely. Not far from these steep banks, gabion and rip-rap are used as a means of erosion control. This type of erosion control is used throughout the arroyo. As the arroyo runs beneath Pacheco Street, water has scoured an area under the culverts. The banks remain steep. **18 inches of utility pipe are exposed in the arroyo bed. Trash is also invasive throughout this segment.**

Exposed utility pipe in Lower Arroyo Pinos, Segment B.

Eroding banks in Lower Arroyo Pinos, Segment B.

The stretch between St. Francis and the Rail Runner crossing is populated with dense ground vegetation and trees. In several areas beneath the trees the arroyo is shallow and opens into a pseudo flood plain, later returning to an incised channel after passing under the Rail Runner tracks.

The Lower Arroyo de los Pinos becomes a long, narrow, increasingly deep ditch as it flows towards 6th Street. It is strewn with trash, concrete, and rocks. Banks are undercut and are high in

areas. The culverts are filled with silt, rocks, and concrete, thus causing them to be plugged or filled with sediment.

This arroyo segment runs through a highly populated area where some properties have pipes protruding into the arroyo for unknown purposes. Scattered trash exists throughout the landscape.

Culvert obstructed by cement dumped into Lower Arroyo Pinos, Segment B.

Segment C. St. Michaels Drive to Camino Carlos Rey

A severely constricted incised channel defines ninety percent of the arroyo between St. Michael's Drive and Camino Carlos Rey. The entirety of the channel is eighty percent sheathed in gabion or rip-rap in various states of disrepair.

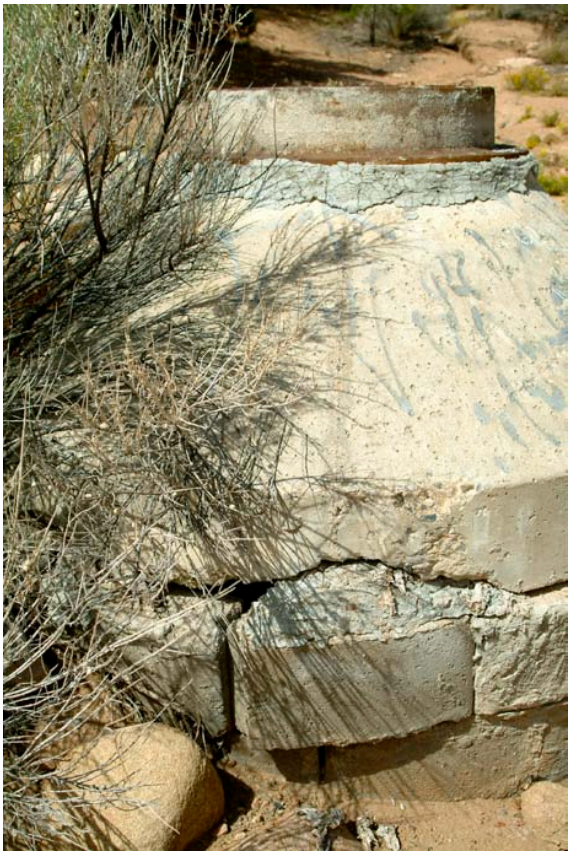
The arroyo is not used as a passive recreational path. Trash levels are high throughout this area. Another concern is the slow evaporation of standing water under rip-rap outfalls. Erosion is the leading cause of infrastructure deterioration in this segment of Arroyo de los Pinos. Erosion appears around edges of gabion walls, culverts, rip-rap, and box culverts. There are severe erosion conditions along Siringo Road where the arroyo banks are extremely high and vertical. An exposed utility line above the Siringo Road Bridge crossing near Yucca Street was located. A manhole was found emerging from the arroyo bank while another with a cracked concrete liner was discovered in the arroyo near the Lafarge Library. Culverts in the Arroyo de los Pinos system are either restricted or occluded by debris.

5th street sidewalk threatened by erosion Lower Arroyo Pinos, Segment C.

Manhole in bank of Lower Arroyo Pinos, Segment C.

Vertical banks in front of La Farge Library, Lower Arroyo Pinos, Segment C.

Exposed utility line off of Llano Street Bridge, Lower Arroyo Pinos, Segment C.



Sewer utility decaying, Lower Arroyo Pinos, Segment C.

Segment D. Camino Carlos Rey to Richards Avenue

There are no changes in the arroyo's channel characteristics in Segment D.

Standing water, Lower Arroyo Pinos, Segment D.

Tires, trash, water, Lower Arroyo Pinos, Segment D.

Trash in Lower Arroyo Pinos, Segment D.

Erosion at Camino Carlos Rey Bridge, Lower Arroyo Pinos, Segment D.

Segment E. Richards Avenue to the Confluence of Arroyo de los Chamisos

The Arroyo de los Pinos continues to be constricted and incised to the end. Past the Kachina Ridge crossing infrastructural issues exist. Here culverts filled with silt and destroyed rip-rap is common. High vertical walls and collapsed banks punctuate this segment as a result of severe erosion. One above ground manhole was found completely exposed near the Game and Fish warehouse. Outfalls and rip-rap continue to deteriorate, while culverts are compromised by restrictions or occlusions.

Erosion at edges of gabion walls, Lower Arroyo Pinos, Segment E.

Lower Arroyo Pinos, Segment E .

Undercut rip–rap in Lower Arroyo Pinos, Segment E.

Segment X. St. Michaels Drive to the La Farge Library

The entrance into this segment of arroyo is poorly drained due to an occluded culvert. It was observed submerged underwater. The channel characteristics in this location are constricted yet shallow. Interestingly, the arroyo lacks any twists or turns. Part of the arroyo is used as a path for the Santa Fe University of Art and Design. Trash accumulation becomes severe after passing the Santa Fe University of Art and Design. Rip-rap, gabion walls, and cross veins are encountered as the arroyo nears the library. The arroyo's end point is sheathed in yards of rip-rap and gabion structures.

Clogged culvert, Lower Arroyo Pinos, Segment X.

IX. Arroyo Mascaras

Arroyo Mascaras travels downstream towards the river from its beginning on the other side of lower Bishop's Lodge Road Bridge. The buildup of sediment under the bridge is moderate. First, it passes through Ft. Marcy Park where the banks are very steep yet stable. It is incised through this area but not severely. There are unstable walls in the bottom of the arroyo from worn out riprap. There is also an occluded culvert in this arroyo. Beneath the Camino Santiago Bridge the buildup of sediment is moderate. Later the arroyo parallels the Old Taos Highway where illegal dumping is prevalent. The Arroyo Mascaras then flows beneath Paseo de Peralta later emerging from the Guadalupe Street box culverts. Arroyo Mascaras flows parallel to an established path from Guadalupe Street to W. San Francisco Street. This path could be extended to St. Francis Drive. Between these two streets there is moderate bank erosion, a severely damaged gabion wall, and missing rip-rap beneath a culvert, which is causing damage to the arroyo bed. Next, Arroyo Mascaras flows beneath another moderately silted bridge of Saint Francis Drive to connect with the confluence of the Santa Fe River.

Damaged wall in bottom of Arroyo Mascaras.

Damaged rip-rap in Arroyo Mascaras.

X. Arroyo de la Piedra

Segment A. Piedra East from Above Brownell- Howland to its intersection with Piedra West

The segment begins north of the neighborhood of Brownell–Holland and ends at the intersection of the west fork of Arroyo Piedra near Paseo del Sur. This arroyo begins as a winding fairly open drainage. Winding its way over historical Civilian Conservation Corps rockwork, rip-rap, gabion, through culverts, over exposed pipes and past a large riparian area, the arroyo meets its west fork. Erosion conditions seem to become worse as the arroyo nears the Paseo del Sur area. A multitude of high cut banks along with sediment filled culverts exemplify the nature of erosion as this arroyo meets its west fork.

Exposed utility lines in Arroyo Piedra East, Segment A.

Exposed utility in Arroyo Piedra East, Segment A.

Obstructed culverts crossing Arroyo Piedra East, Segment A.

Eroded banks in Arroyo Piedra East, Segment A.

Segment B.Piedra West from upper Bishop's Lodge Road to Arroyo Mascaras

The landscape of Arroyo Piedra West begins as a wide-open sand filled drainage enclosed by high, steep, sloping banks. The area runs through a piñion, juniper, and ponderosa habitat. The arroyo continues narrowing along the way until it reaches Barranca Drive where erosion becomes moderate to extreme in the arroyo before this point. Along this route high steep cut walls and deteriorating concrete culverts are a common sight. One culvert along Bishops Lodge Road protrudes over 20 feet of empty space before draining into the arroyo. **This location may be hazardous to drivers along Old Bishop's Lodge Rd.** The culverts appear to be causing severe erosion in this area.

Upon reaching the Barranca Road area multiple areas of La Piedra are impassable owing to a multitude of private fences spanning the arroyo bed. The high density of housing appears when re-entering the arroyo. As a result, the amount of infrastructure encountered rises. Erosion in this area is moderate to severe thus causing damage to culverts, banks, and exposing utilities. Once the last man-made barrier is crossed, the arroyo approaches the confluence of Arroyo Mascaras in an ever widening manner.

Damaged culverts, Arroyo Piedra West, Segment B.

Damaged Culverts, Arroyo Piedra West, Segment B.

Exposed utility lines in the bed of Arroyo Piedra East, Segment B**.**

Arroyo Name:	Arroyo de los Chamisos	date:	8/14/2012
Arroyo Segment:	A	surveyed by:	Keely Jackson Kennemore
Start point:	approx. 800 feet upstream from Old Santa Fe trail		
End point:	Old Santa Fe Trail		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged / Restricted Culverts	Foot / Bicycle Bridges	Vehicle Bridges	Endangered utilities	Overall Score
0	2	4	0	2.5	1	**2.41**
Passive walking and biking path			none		Manhole near eroding bank	
					exposed pipe line	

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	3	3	3	3	**2.5**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0 F=0.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Chamisos	date:	8/14/2012
Arroyo Segment:	B	surveyed by:	Keely Jackson Kennemore
Start point:	Old Santa Fe Trail		
End point:	Conejo Road		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridges	Vehicle Bridges	Endangered utilities	Overall Score
0	1	4	0	3	4	**2.8**
Passive walking and biking path			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	**3**	**3**	**1**	**3**	**3**	**2.25**
			Collapsing verticla banks are destroying homeowners property line. Close to Conejo road.			

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Chamisos	date:	8/14/2012
Arroyo Segment:	C	surveyed by:	Keely Jackson Kennemore
Start point:	Conejo Road		
End point:	St. Francis Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridges	Vehicle Bridges	Endangered utilities	Overall Score
4	2	4	1	3	4	**2.5**
Gail Roybal Trail			Gail Roybal Trail			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	2.5	2	2	2	3	**2**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Chamisos	date:	8/14/2012
Arroyo Segment:	D	surveyed by:	Keely Jackson Kennemore
Start point:	St. Francis Bridge		
End point:	Yucca Street Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
3	0.1	1	0	1	1	**1.1**
Arroyo Chamisos Trail			none			
Banks are in trouble						
Trail in danger						

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
1	2	1	0.5	0.5	1	**0.66**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0 F=0.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Chamisos	date:	8/15/2012
Arroyo Segment:	E	surveyed by:	Keely Jackson Kennemore
Start point:	Yucca Street Bridge		
End point:	Camino Carlos Rey Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
4	2	3	0	3	4	**2.8**
Arroyo Chamisos Trail			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	3	2	3	3	**2.3**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Name:	Arroyo de los Chamisos	date:	8/15/2012
Arroyo Segment:	F	surveyed by:	Keely Jackson Kennemore
Start point:	Camino Carlos Rey		
End point:	Ave de la Campana Bridge Crossing		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
4	3	3	0	3	4	**3**
Arroyo Chamisos Trail			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	3	3	3	1	**2**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Chamisos	date:	8/15/2012
Arroyo Segment:	G	surveyed by:	Keely Jackson Kennemore
Start point:	Ave de la Campana Bridge		
End point:	Rodeo Road Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
4	2	4	0	3	1	**2.3**
Arroyo Chamisos Trail			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3.5	3.5	0.1	0.1	1	**1.8**
			Kachina Heights area	Kachina Heights area	undercut	

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Chamisos	date:	8/15/2012
Arroyo Segment:	H	surveyed by:	Keely Jackson Kennemore
Start point:	Rodeo Road Bridge		
End point:	Governor Miles Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridges	Vehicle Bridges	Endangered utilities	Overall Score
4	3	3	4	2	1	**2.3**
Arroyo Chamisos Trail				auto park bridge h silt build up		

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	3	4	2.7	2	**2.6**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo Rosario	date:	8/22/2012
Arroyo Segment:		surveyed by:	Keely Jackson Kennemore
Start point:	Headwaters		
End point:	Paseo de Peralta		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	2	0.1	0	2	1	**1.9**
no trail	from the headwaters to St. Catherine's	one occlusion at Griffin St. Crossing	none	Griffin Street		
passive recreational use		all culverts at Criffin St. Crossing				

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	3	2	3	2	2	**2.3**
1.Most of the channel characteristics to note occur near the headwaters to the area before St. Catherine's school. 2.rip-rap on one small area of the wall is missing causing it to begin to collapse(area below Griffin St. Crossing)						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo Saiz	date:	8/29/2012
Arroyo Segment:		surveyed by:	Keely Jackson Kennemore
Start point:	Bishop's Lodge Road at Gonzales		
End point:	Santa Fe River		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridge	Endangered utilities	Overall Score
0	2	1	4	3	0.1	**2**
no trail		Lorenzo Road area	none		small electrical line exposed from private residence	
		passing under a private drive			exposed pipe line	

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
1.5	1.5	1.5	2.5	2.5	1	**1.25**
1.Bishops lodge road drains into arroyo causing some incising into the beginning of arroyo. Beginning to erode road shoulder. The upper arroyo has more incised tributaries. Rip -rap in these tributaries is rotting and in need of repairs to improve drainage.						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo Mora	date:	8/30/2012
Arroyo Segment:		surveyed by:	Keely Jackson Kennemore
Start point:	Santa Fe River		
End point:	Arroyo fenced: unable to complete		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehilcle Bridges	Endangered utilities	Overall Score
0	2	4	0	3	1	**2.5**
no trail	deteriorating wall causing bank erosion		none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	3	3	3	2	2	**2**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo Cabra	date:	8/30/2012
Arroyo Segment:		surveyed by:	Keely Jackson Kennemore
Start point:	Santa Fe River		
End point:	Fenced Private Property incomplete		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridge	Endangered utilities	Overall Score
0	2.5	1.1	0	4	4	**2.8**
no trail			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
1.5	2	1.5	1.75	1.25	1	**1.5**
1. Upstream side of Canyon Rd. bridge the rip-rap beneath a culvert was missing.						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo en Medio	date:	9/5/2012
Arroyo Segment:	A	surveyed by:	Keely Jackson Kennemore
Start point:	Old Santa Fe Trail (near Santa Fe County Rd 67)		
End point:	Old Las Vegas Hwy Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridges	Vehicle Bridges	Endangered utilities	Overall Score
0	2.5	4	0	3	1	**2.9**
no trail			none		Monitor utility pole on island as ierosion is severe	

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	2	3	2.5	2.7	3	**2.3**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo en Medio	date:	9/5/2012
Arroyo Segment:	B	surveyed by:	Keely Jackson Kennemore
Start point:	Old Las Vegas Hwy Bridge		
End point:	Old Pecos Trail Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridges	Vehicle Bridges	Endangered utilities	Overall Score
0	3	4	0	1	2.5	**2.9**
no trail			none		none	

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2.5	2.5	3	3	2	3	**2.5**
1. Vertical bank above Old Pecos bridge is eroding along the shoulder of the road.						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo en Medio	date:	9/5/2012
Arroyo Segment:	C	surveyed by:	Keely Jackson Kennemore
Start point:	Old Pecos Trail Bridge		
End point:	Rodeo Road Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridges	Vehicle Bridges	Endangered utilities	Overall Score
0	3	4	0	3	3.5	**3**
no trail			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	3	2	2	2	**2**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo en Medio	date:	9/5/2012
Arroyo Segment:	D	surveyed by:	Keely Jackson Kennemore
Start point:	Rodeo Road Bridge		
End point:	Sawmill Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridges	Vehicle Bridges	Endangered utilities	Overall Score
0	3	1	0	3	0	**2.3**
no trail		Beneath culvert severe erosion /silting	none		one pipe exposed	

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	3.5	2.5	2	2	3	**2**
1. channel incisions occur around rip rap						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo en Medio	date:	9/5/2012
Arroyo Segment:	E	surveyed by:	Keely Jackson Kennemore
Start point:	Sawmill Road Bridge		
End point:	St. Francis Road Bridge		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	2.5	1	0	3	0.25	**2**
no trail		Culvert eroding from wall of Arroyo	none		one pipe exposed	
		silting				

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	3	1	1	2	**1.75**
1. channel incisions occur around rip rap 2. Banks vertical around eroded culvert						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Canada Ancha	date:	9/10/2012
Arroyo Segment:	A	surveyed by:	K.J. Kennemore and R. Hilliard
Start point:	Headwaters (near 10,000 Waves)		
End point:	Canada Norte Dr		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bike Bridges	Vehicle Bridges	Endangered utilities	Overall Score
0	2	1.5	0	3	0	**2**
Passive recreational use			none		Areas of concern below Cerro Colorados 1. cable exposured x 3 ./ 2 pipes exposed / sewage lines	

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	2	2	2.5	2.5	2.5	**2**
1. crushed culvert 2. sagging smashed gabion wall 3. silt in culverts						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Canada Ancha	date:	9/10/2012
Arroyo Segment:	B	surveyed by:	K J Kennemore/ R. Hilliard
Start point:	Canada Sur		
End point:	Santa Fe River		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bike Bridges	Vehicle Bridges	Endangered utilities	Overall Score
0	2	1	0	3	0	**0**
passive recreational use			none		1.Black cable uncovered by water2. Large pipes exposed 3. man hole with future potential for problems	

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	2	2	2	2	2	**1.75**
1. Across Lorenzo road riprap is undercut. A bank next to a gabion wall has potential for future collapse.						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Pinos	date:	9/17/2012
Arroyo Segment:	Upper A	surveyed by:	Kennemore/Hilliard
Start point:	Camino Corrales/Lejo		
End point:	Galisteo		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
4	3	0.5	0	2	4	**2.5**
Botanical Garden Trail		near Old Pecos Trail	none	Build up of silt		

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	2	2	3	3	3	**2**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Pinos	date:	9/17/2012
Arroyo Segment:	Upper B	surveyed by:	KJ Kennemore / R. Hilliard
Start point:	Camino Corrales/Lejano		
End point:	Don Gaspar		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	2	2	0	3	4	**2.8**
Unofficial walking trails		at Don Gaspar	none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	3	2	3	3	2	**2**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Pinos	date:	9/13/2012
Arroyo Segment:	A. Lower Pinos	surveyed by:	K. J Kennemore / R Hilliard
Start point:	Galisteo		
End point:	St. Francis Drive		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	3	3	0	4	1	**2.3**
Passive trail established biking/walking			none			
E.J. Martinez area						

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	2	3	3	2.5	**2.3**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Pinos	date:	9/25/2012
Arroyo Segment:	B. Lower Pinos	surveyed by:	Keely Jackson Kennemore
Start point:	St. Francis Drive		
End point:	6th Street		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	2	1	0	3	1	**2**
no public trail		Espinacitas St Crossing culverts plugged with silt/5th St severly cloogged	none		Exposed pipe	
passively used as a short cut from St Francis Drive to Rail Trail						

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	2	3	2	2	**2.3**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Pinos	date:	9/25/2011
Arroyo Segment:	C. Lower Pinos	surveyed by:	K. Jackson Kennemore
Start point:	St. Michaels Drive		
End point:	Camino Carlos Rey		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	3	2	0	3	1	**2.3**
no trail			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
1	3	1	2.5	1	1.75	**1.62**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Pinos	date:	9/12/2012
Arroyo Segment:	D. Lower Pinos	surveyed by:	K.Kennemore / R Hilliard
Start point:	Camino Carlos Rey		
End point:	Richards Avenue		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	2	3	0	2	1	**2**
no trail			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
1	4	1	2	1	1.75	**1.4**

Graded Scoring System A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Pinos	date:	9/17/2012
Arroyo Segment:	E. Lower Pinos	surveyed by:	K. J Kennemore / R Hilliard
Start point:	Richards Avenue		
End point:	Confluence with Arroyo Chamiso		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	1	3	0	3	1	**2**
no trail			none			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
1	3.5	1	1	1	2	**1.1**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de los Pinos	date:	9/18/2012
Arroyo Segment:	X. Lower Pinos	surveyed by:	K. J Kennemore
Start point:	St. Michaels Drive		
End point:	Llano Street Library		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridge	Endangered utilities	Overall Score
0	2.5	0	0	4	4	**2.67**
no trail			none			
passive shortcut to library						

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	3	3	2	3	2	**2.5**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo Mascaras	date:	8/23/2012
Arroyo Segment:		surveyed by:	Keely Jackson Kennemore
Start point:	Bishop's Lodge Road Bridge		
End point:	Santa Fe River		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
4	3	3	4	3	4	**3**
paved section near W. San Francisco Street			Connects from Paseo de Peralta to paved trail			

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
3	3	3	3.5	3	0	**2.5**
1.A constricted area occurs just beneath an outfall located above the W. San Francisco Bridge were excessive flows have destroyed what looks to have been rip- rap or gabion wall. 2. In this area a catch basin made of rip -rap below a culvert has been damaged.3. Near Ft. Marcy park beside a trail the rip-rap is sagging. 4. The rip-rap covering two gabion walls in the Ft. Marcy area is torn off.						

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de la Piedra	9/24/2012
Arroyo Segment:	East Fork	surveyed by: Kennemore/Hilliard
Start point:	Above Brownell Howland Road	
End point:	West fork of Arroyo Piedra	

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged / Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	2	1.5	0	2.5	0	**2**
no public trail			none		exposed pipes	
scattered walking paths through out						

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
1.75	1.5	1.5	1.5	1.5	1.5	**1.5**

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Arroyo Documentation

Arroyo Name:	Arroyo de la Piedra		9/24/2012
Arroyo Segment:	West Fork	surveyed by:	K J Kennemore and R.Hilliard
Start point:	Old Bishops Lodge Road		
End point:	West fork of Arroyo Piedra		

INFRASTRUCTURE RISKS

Trail Deterioration	Bank Deterioration	Damaged/ Restricted Culverts	Foot/Bicycle Bridge	Vehicle Bridges	Endangered utilities	Overall Score
0	2.5	1.5	0	4	0	**2**
no public trail		Concrete facing falling apart	none		multiple exposed pipes	
scattered walking paths through out		Culverts falling off Old Bishops Lodge Road				

CHANNEL CHARACTERISTICS

Incised channel	Incised + braided	Constricted	Collapsed Banks	Vertical Banks	Rip Rap	Overall Score
2	3	1	2.5	1	2	**1.75**
				dangerous one on Old Bishops Lodge Road		

GRADED SCORING SYSTEM A=4.0 B=3.0 C=2.0 D=1.0

Appendix B

Map for GO Bond Arroyo Maintenance Project

GO Bond Arroyo Maintenance Project

Legend

GO Bond Arroyos

- High Priority
- Low Priority

GPS Photo Locations by Date

- Arroyo Rosario - 0822
- Arroyo Mascaras - 0823
- Arroyo Saiz - 0829
- Arroyo Cabra - 0830
- Arroyo En Medio - 0905
- Canada Ancha - 0910
- Arroyo De Los Pinos - 0911
- Arroyo De Los Pinos - 0912
- Arroyo Mora - 0913
- Arroyo De Los Pinos - 0917
- NW Arroyo De Los Pinos - 0918
- East Arroyo De La Piedra - 0924
- Arroyo De Los Pinos - 0925
- Arroyo De La Piedra - 0926
- City Council Districts
- City Owned Land

FEMA Floodplain (June 17, 2008)

Flood Zone

- 100 year
- 500 year

Council District 1

Council District 2

Council District 3

Council District 4

TANO RD
TIERRA
VETERANS MEMORIAL HWY
NM 599 EXIT
NM 599 FRONTAGE RD
NOPAL
PASEO
BUCKMAN RD
CAMINO DE LAS CRUCITAS
PASEO DE VISTAS
RINCON DE TORREON
SANTA FE RIVER
W ALAMEDA ST
AGUA FRIA ST
OSAGE AVE
VETERANOS
AVENIDA RINCON
US 84-285
CAMINO FRANCISCA
ARROYO ROSARIO
N SAINT FRANCIS DR
GUADALUPE ST
N GUADALUPE ST
W SAN FRANCISCO ST
PASEO DE PERALTA
ARROYO MASCARAS
ARROYO DE LA PIEDRA
CAMINO ENCANTADO
BISHOPS LODGE RD
WEST ARROYO DE LA PIEDRA
EAST ARROYO DE LA PIEDRA
CANADA ANCHA
HYDE PARK RD
ARROYO SAIZ
E PALACE AVE
E ALAMEDA ST
GONZALES RD
CANYON RD
ACEQUIA MADRE
CAMINO CABRA
HICKOX ST
S GUADALUPE ST
BACA ST
DON GASPAR AVE
GARCIA ST
PACHECO ST
ALTA VISTA ST
CORDOVA RD
S SAINT FRANCIS DR
ARROYO DE LOS PINOS
OLD SANTA FE TRAIL
CAMINO CORRALES
CAMINO DE CRUZ BLANCA
OLD PECOS TRAIL
ARROYO DE LOS CHAMISOS
SAINT MICHAELS DR
ARROYO CHAMISO RD
BOTULPH RD
E ZIA RD
W ZIA RD
OLD PECOS TRL
SIRINGO RD
CAMINO CARLOS REY
RICHARDS AVE
SILER RD
CERRILLOS RD
CAJA DEL ORO GRANT RD
RUFINA ST
LOPEZ LN
ZAFARANO DR
JEMEZ RD
AIRPORT RD
S MEADOWS RD
YUCCA ST
RODEO RD
ARROYO EN MEDIO
I-25 NORTH
I-25 SOUTH
EXIT 282 ON
EXIT 282 OFF
OLD LAS VEGAS HWY
OLD SANTA FE TRL

N
W
E
S

1:42,000

1 inch = 3,500 feet

0 1,750 3,500

Feet

This information is for reference only. The City of Santa Fe assumes no liability for errors associated with the use of these data. Users are solely responsible for confirming data accuracy when necessary.

January 18, 2013