Appendix D.2: Jurisdictional Delineation

SKYPARK AT SANTA'S VILLAGE

UNINCORPORATED COMMUNITY OF SKYFOREST, SAN BERNARDINO COUNTY, CALIFORNIA

Delineation of State and Federal Jurisdictional Waters Report

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Prepared For:

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January 2016
Updated March 2017
JN: 144067

SKYPARK AT SANTA'S VILLAGE

UNINCORPORATED COMMUNITY OF SKYFOREST, SAN BERNARDINO COUNTY, CALIFORNIA

Delineation of State and Federal Jurisdictional Waters

The undersigned certify that this report is a complete and accurate account of the findings and conclusions of a jurisdictional "waters of the United States" (including wetlands) and "waters of the State" determination for the above-referenced project.

Travis J. McGill
Biologist
Natural Resources

Thomas J. McGill, Ph.D.
Vice President
Natural Resources

January 2016
Updated March 2017

Executive Summary

Michael Baker International (Michael Baker) has prepared this Delineation of State and Federal Jurisdictional Waters for the Skypark at Santa's Village project (Project) located in the Unincorporated Community of Skyforest, San Bernardino County, California. The delineation documents the regulatory authority of the United States Army Corps of Engineers (Corps), the Regional Water Quality Control Board (Regional Board), and the California Department of Fish and Wildlife Inland Deserts Region (CDFW) pursuant to Section 401 and 404 of the Federal Clean Water Act, the California Porter-Cologne Water Quality Control Act, and Section 1600 *et. seq.* of the California Fish and Game Code.[1]

Four (4) drainage features were observed within the boundaries of the project site; Hencks Meadow, Hooks Creek, and three (3) unnamed ephemeral drainage features (Drainages 1-3). Hooks Creek and Drainage 1 are tributary to Deep Creek (Relatively Permanent Water) and ultimately the Mojave River (Traditional Navigable Water). Whereas, Drainage 2 and 3 flow into City Creek which is tributary to the Santa Ana River (Relatively Permanent Water) and ultimately the Pacific Ocean (Traditional Navigable Water). As a result, Hencks Meadow, Hooks Creek and Drainages 1-3 all qualify as waters of the United States and fall under the regulatory authority of the Corps, Regional Board, and CDFW. Refer to Table ES-1 for a summary of jurisdictional areas and anticipated project impacts.

Table 1: Jurisdictional Areas and Impact Summary

Jurisdictional Feature	Corps (NRCS) Waters of the United States		CDFW Streambed / Regional Board Waters of the State			
	On-Site Jurisdiction		On-Site Jurisdiction		Jurisdictional Impact	
	Acres	Feet	Acres	Feet	Permanent	Temporary
Hencks Meadow	0.08	530	2.55	530	0.15	0.40
Hook's Creek	1.25	2,584	2.56	2,584	0.14	0.13
Drainage 1 (D-1)	0.06	756	0.06	756	0.0	0.0
Drainage 2 (D-2)	0.06	786	0.06	786	0.0	0.0
Drainage 3 (D-3)	0.04	614	0.04	614	0.0	0.0
TOTALS	**1.49**	**5,270**	**5.27**	**5,270**	**0.29**	**0.53**

[1] The project site was surveyed on November 20, 2014 and September 23, 2015 pursuant to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (Corps 2008); the Practices for Documenting Jurisdiction under Section 404 of the CWA Regional Guidance Letter (Corps 2007); and Minimum Standards for Acceptance of Preliminary Wetland Delineations (Corps 2001); the MESA Field Guide (CDFW 2014); and a Review of Stream Processes and Forms in Dryland Watersheds (CDFW 2010).

No impacts to Hooks Creek, or Drainages 1-3 are anticipated from installation of the proposed trials, except within the meadow area. Construction of proposed new trails outside of the meadow, but within the project site, will avoid impacts to jurisdictional waters. The existing trials within the project site will generally be left in a "rough" state, unpaved and with brush cleared and overhanging vegetation trimmed. No dredging or fill material will be placed in any of the jurisdictional features outside of the meadow area on-site. Any proposed trail crossings adjacent to or over jurisdictional features will occur outside of the jurisdictional limits of Corps, Regional Board, and CDFW. In particular, proposed trails will be installed over the drainage feature, outside of the top of bank. Additionally, an elevated trail will be installed within the temporarily disturbed portions of Hencks Meadow and Hooks Creek as part of the meadow rehabilitation project. Since the trail will be elevated, plants will be able to grow under the trail, and impacts to Hencks Meadow and Hooks Creek, as part of the meadow rehabilitation project, have been accounted for in the temporary impact analysis in this report.

In agreement with between Skypark and the Natural Resources Conservation Service (NRCS), the proposed project includes the rehabilitation of Henck's Meadow (restoration and improvement of the upstream portions of Hook Creek). Since there is an established agreement between Skypak and the NRCS, and the meadow rehabilitation is a planned NRCS activity, a Corps CWA Section 404 permit will not be required from the Corps for the meadow rehabilitation project.

Based on a review of site conditions and preliminary design plans, the project applicant will need to obtain the following regulatory approvals for any impacts to Hencks Meadow and Hooks Creek associated with the meadow rehabilitation project: Regional Board Report of Waste Discharge and CDFW Section 1602 Streambed Alteration Agreement (SAA).

Refer to Sections 1-7 for a detailed analysis of site conditions and recommendations.

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LIST OF ACRONYMS

CDFW	California Department of Fish and Wildlife
Corps	United States Army Corps of Engineers
CWA	Clean Water Act
EPA	Environmental Protection Agency
FAC	Facultative Vegetation
FACU	Facultative Upland Vegetation
FACW	Facultative Wetland Vegetation
Michael Baker	Michael Baker International
NRCS	Natural Resources Conservation Service
OBL	Obligate Wetland Vegetation
OHWM	Ordinary High Water Mark
Regional Board	Regional Water Quality Control Board
RPW	Relatively Permanent Waters
Skypark	Skypark at Santa's Village, LLC
SWANCC	Solid Waste Agency of Northern Cook County
TNW	Traditional Navigable Water
UPL	Obligate Upland Vegetation
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

Section 1 Introduction and Purpose

This delineation has been prepared for the Skypark at Santa's Village, LLC (Skypark), in order to document the jurisdictional authority of the U.S. Army Corps of Engineers' (Corps), the Lahontan Regional Water Quality Control Board (Regional Board), and the California Department of Fish and Wildlife (CDFW) pursuant to Section 401 and 404 of the Federal Clean Water Act (CWA), the California Porter-Cologne Water Quality Control Act, and Section 1600 *et seq.* of the Fish and Game Code. The analysis presented in this report is supported by field surveys and verification of site conditions conducted on November 20, 2014 and September 22, 2015.

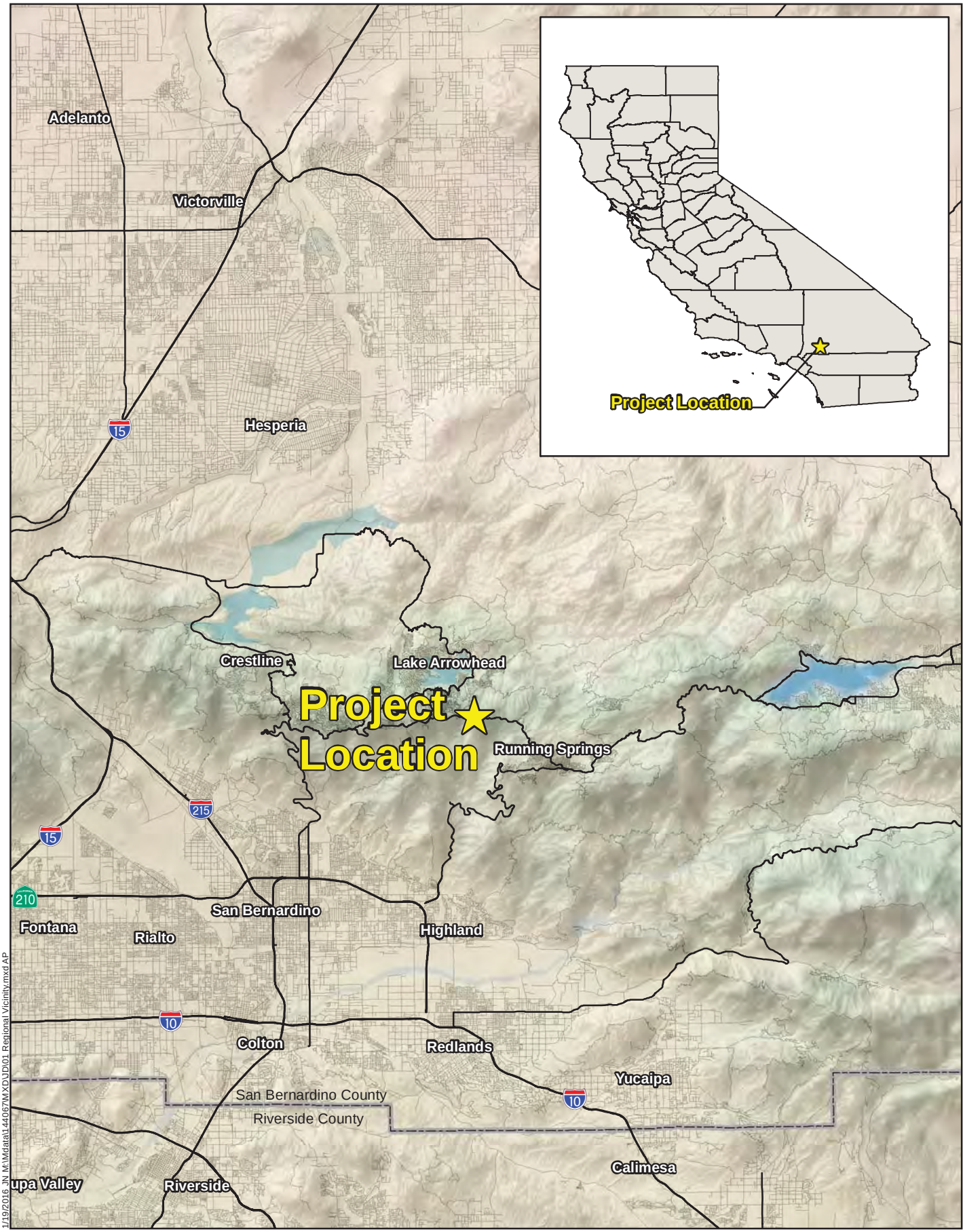
This delineation explains the methodology undertaken by Michael Baker to define the jurisdictional authority of the regulatory agencies, and documents the findings made by Michael Baker. This report presents our best effort at determining the jurisdictional boundaries using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. Ultimately, the regulatory agencies make the final determination of jurisdictional boundaries.

1.1 PROJECT LOCATION

The project site is located in the San Bernardino Mountains south of Lake Arrowhead in the unincorporated community of Skyforest, San Bernardino County, California (Exhibit 1, *Regional Vicinity*). The project site is depicted on the Harrison Mountain quadrangle of the United States Geological Survey's (USGS) 7.5-minute topographic map series in Section 26 of Township 2 north, Range 3 west (Exhibit 2, *Site Vicinity*). Specifically, the project site is located north and south of State Route 18 (SR-18) and west of Sycamore Drive in the San Bernardino National Forest (Exhibit 3, *Project Site*).

1.2 PROJECT DESCRIPTION

The proposed project includes a General Plan Amendment to change the Official Land Use District from Lake Arrowhead/Special Development- Residential (LA/SD-RES) & Lake Arrowhead/Single Residential-14,000 Square Foot Minimum lot size (LA/RS-14M) to Lake Arrowhead/Rural Commercial (LA/CR) on 152.92 acres. The proposed project requires a Conditional Use Permit to re-establish an Outdoor Commercial Entertainment Center which includes an Amusement Park, Campground, Meadow Rehabilitation, Restaurants, Bar, Wedding & Reception Facility, Retail, Trails, Recreational Activities and other Accessory Uses on 152.92 acres.



1/19/2016 JN M:\Mdata\144067MXD\JD\01 Regional Vicinity.mxd AP

SKYPARK AT SANTA'S VILLAGE
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

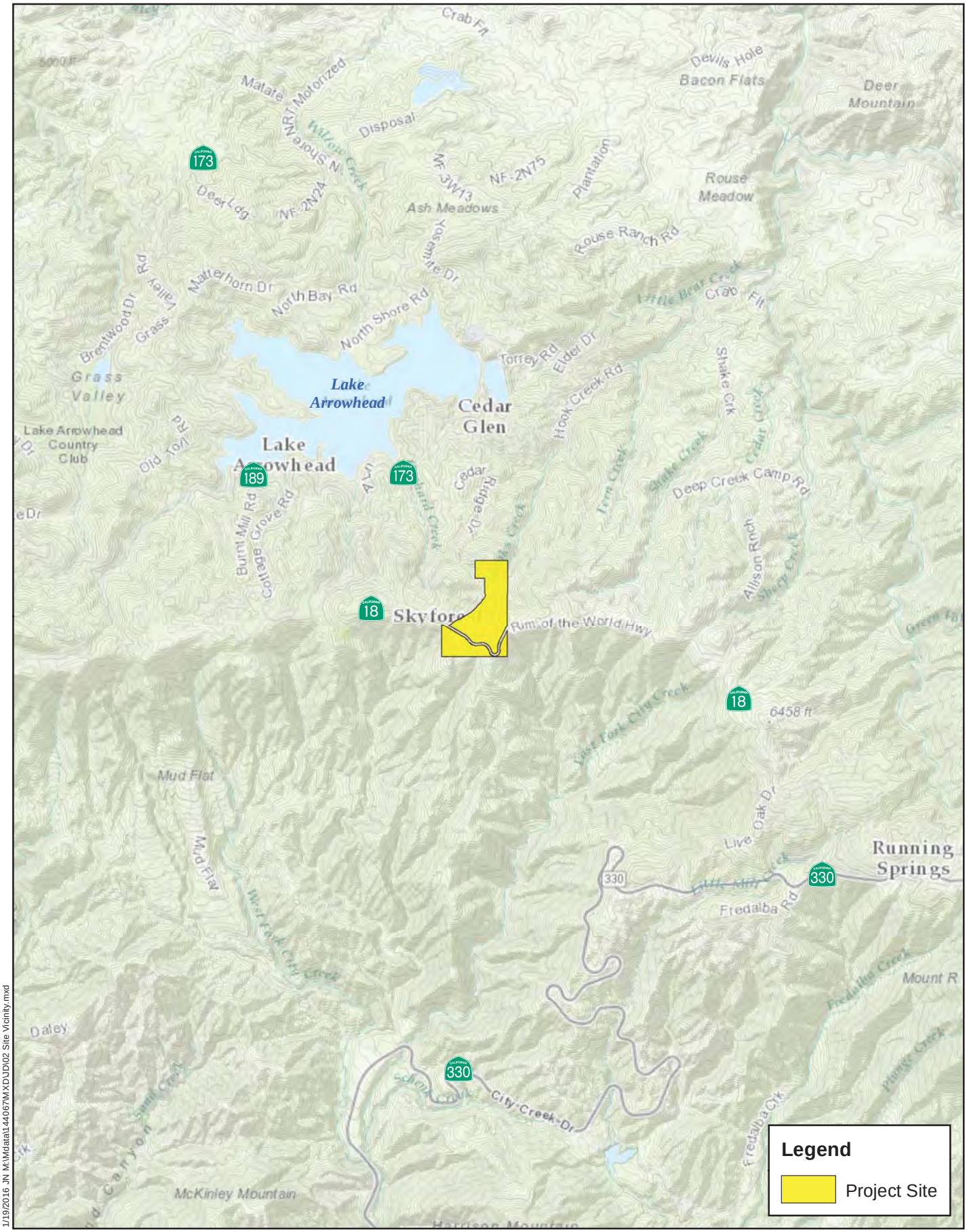
Regional Vicinity

Michael Baker INTERNATIONAL

0 2.5 5 10 Miles

Source: ESRI Relief Map, National Highway Planning Network

Exhibit 1



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SKYPARK AT SANTA'S VILLAGE
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

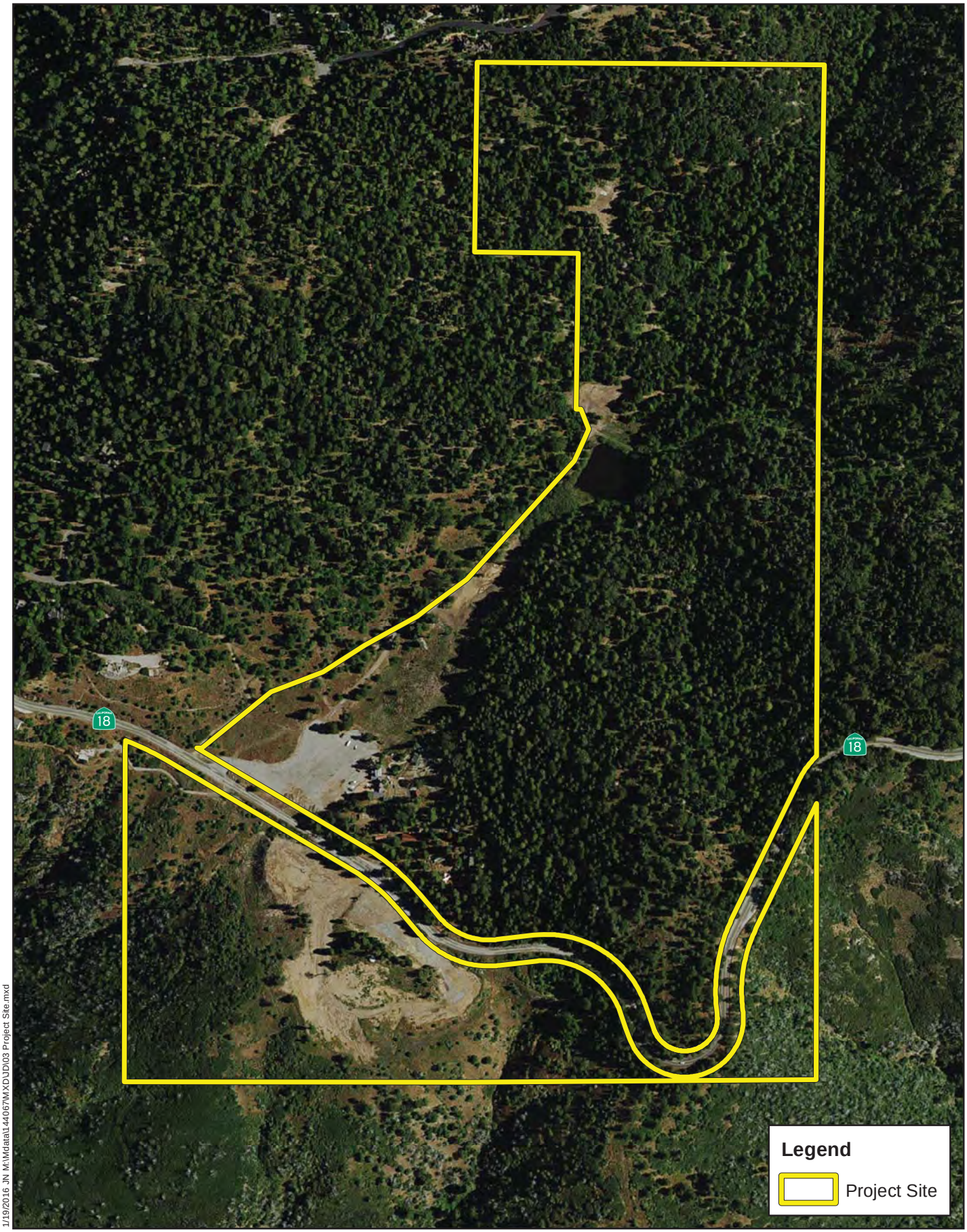
Site Vicinity

Michael Baker INTERNATIONAL

0 0.5 1 2 Miles

Source: San Bernardino County, USGS, ESRI World Topographic Map

Exhibit 2



1/19/2016 JN M:\Mdata\144067\MXD\JD\03 Project Site.mxd

SKYPARK AT SANTA'S VILLAGE
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

Michael Baker INTERNATIONAL

0 250 500 1,000
Feet

Source: San Bernardino County, ESRI World Imagery Basemap

Project Site

Exhibit 3

The proposed project includes the redevelopment and re-use of the existing Santa's Village attraction. The proposed project also includes the development of a mixed-use adventure park that would include a variety of activities and services. Nineteen original buildings exist on the project site totaling 23,389 square feet. It is intended that the exteriors of these original buildings would not be significantly altered. Rather, the exterior of the buildings will be rehabilitated (re-painted, repaired). The interiors will be redeveloped in order to fulfill a variety of uses. All existing buildings will remain. No buildings are proposed to be demolished. The existing buildings that are being rehabilitated are identified on Exhibit 4, *Depiction of Proposed Project*, and are listed in Table 1 below.

Improvements to Santa's Village attraction will also include the repair of hardscaping and landscaping. The asphalt pavement between the buildings will be replaced with concrete and rock and other hardscaping to improve on site drainage. The attraction is located within and includes native forest trees and native shrubs. The proposed improvements include only minimal landscaping which may include native and drought tolerant shrubs and annuals/flower beds commonly used in landscaping. The site currently has minimal landscaping and will continue to have minimal landscaping as the site does not have a formal irrigation system. Existing forest trees are supported by natural rainfall and snow. Existing understory landscaping is supported by natural rainfall and snow and is only supplemented by hand watering.

Additional recreational and entertainment amenities will be constructed as a part of the proposed project and are outlined below.

Amusement Park Zone

The Amusement Park Zone is an area within the property boundary where more concentrated amusement park use will occur. The zone is identified as the area of historic commercial use, previously impacted by the original development of Santa's Village. In order for SkyPark at Santa's Village to retain repeat visitors, to remain competitive in the Adventure and Amusement Park Industry, and to continue to promote tourism in the mountain community, replacement of attractions and/or amenities with new attractions and amenities will be necessary and will occur in the Amusement Park Zone over time. The types of new attractions and amenities in the Amusement Park Zone that are predicted at this time (but not limited to) could include implementation of the original car ride, playground amenities, climbing walls, additional zip lines, snow play activities, and small support structures, such as storage sheds or concessions or other attractions that its primary function is entertainment or recreation. The attractions or features will be similar to the proposed project components outlined below and will not require extensive grading or vegetation clearing or result in a greater generation of noise or light These future attractions will not exceed 40 feet in height, using the existing 40-foot monorail as the baseline of existing improvements in the

PARKING ANAYSIS:

BUILDING & LEGEND NUMBER	USE	SQUARE FEET	FORMULA	BUILDING
1. WELCOME BUILDING	OFFICE	1003	1003 / 250 = 4 SPACES	
	RETAIL	2122	2122 / 250 = 8 SPACES	
2. SANTA'S HOUSE	AMUSEMENT	288	288 / 7 = 41 PERSONS = 10 SPACES	
3. BILLYZ PATIO RESTAURANT	RESTAURANT	1856	1856 / 250 = 7 SPACES	
4. PEDDLE PUB / TAVERN	BAR/TAVERN	688	688 / 100 = 9 SPACES	
5. K's KANDYSHOP	RESTAURANT	905	905 / 250 = 4 SPACES	
6. THE GATHERING HOUSE & EVENTS RESTAURANT		1328	1328 / 250 = 5 SPACES	
7. COFFEE & TEA HOUSE	RESTAURANT	756	756 / 250 = 3 USE 4 MIN.	
8. SKY PARK ACTIVITY CNTR.				
	RETAIL	2148	2148 / 250 = 9 SPACES	
9. STONE'S THROW GAZEBO	RETAIL	756	756 / 250 = 3 USE 4 MIN.	
10. SKY TRADING COMPANY	RETAIL	2452	2452 / 250 = 12 SPACES	
11. SKY PAVILLION	DANCE HALL	1723	1723 / 20 SQ. FT. = 86 PEOPLE = 28 SPACES	
12. REINDEER BARN	RETAIL	1950	1950 /250 = 8 SPACES	
13. BOULDERING ROOM	AMUSEMENT	720	720 /MAX CAPACITY 24 PERSONS = 6 SPACES	
14. RESTROOMS		750	0	
15. RESTROOMS		750	0	
16. PEBBLE MINE MUSEUM	AMUSEMENT	192	192 /1 = 27 PERSONS /4=7 SPACES	
17. CHAPEL OF THE LITTLE SHEPHERD WORSHIP		272	MAX SEATS 12/3 = 4 SPACES	
18. GOOD WITCH'S BAKERY	RETAIL	990	990 /250 = 4 SPACES	
19. WEDDING RECEPTION SITE		500 PERSONS	500 / 3 =167 SPACES	
20. WEDDING CEREMONY SITE		MEETING HALL		
21. SKATING RINK	AMUSEMENT		MAX 200/3 =67 SPACES	
22. BOULDERING & CLIMBING WALL	AMUSEMENT		MAX CAP 12 /4= 3 SPACES	
23. SPYDER BOUNCE	AMUSEMENT		MAX CAP 3/ 4= 1 SPACE	
24. JOHNSON DUMP TRUCK!!!! PLAYSCAPE			MAX CAP 20/4 = 5 SPACES	
25. MAINTENANCE BLDG.	STORAGE		0	
26. SKYBIKE MONORAIL	AMUSEMENT		MAX CAP 50 /4 = 13 SPACES	
27. AERIAL ADVENTURE	AMUSEMENT		MAX CAP 16/ 4 =4 SPACES	
28. TRAIL SYSTEM				
29. WATER FEATURE				
29. LADY BUG POND				
30. TREEHOUSE AERIAL ADVENTURE & PLAYSCAPE			MAX CAP 28/ 4= 7 SPACES	
31. COASTERS BIKE PATH & CAR RIDE			MAX CAP 20 / 4=5 SPACES	

STANDARD SPACES NEEDED	405
DISABLED	8
LOADING SPACES	4
TOTAL SPACES REQUIRED	417
MAIN "NORTH LOT" SPACES	285
CAMP GROUND	70
OVERFLOW "SOUTH PARKING LOT"	200
TOTAL SPACES AVAILABLE	555

UTILITIES

POWER: SO CAL EDISON
P.O. BOX 98
RIM FOREST, CA 92378
(909) 337-2644

TELEPHONE: CHARTER CABLE
P.O. BOX 9
RIM FOREST CA, 92378

WATER: SKY FOREST RURAL WATER CO.
P.O. BOX 3
SKY FOREST CA, 92385
(909) 336-0851

NATURAL GAS: THE GAS CO.
P.O. BOX 3003
REDLANDS CA, 92373
(909) 793-7384

SEWER: ONSITE SEPTIC SYSTEM

CABLE: CHARTER CABLE
P.O. BOX 9
RIM FOREST CA, 92378

UTILITIES

C-1 OVERALL SITE PLAN
C-1.1 ENLARGED SITE PLAN

SHEET INDEX

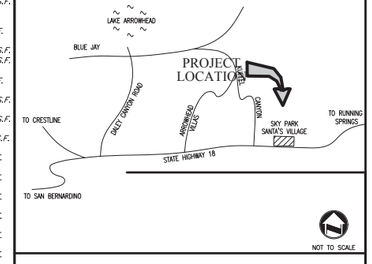
SITE LEGEND

19. RECEPTION SITE (PROPOSED USE)
20. WEDDING CEREMONY SITE (PROPOSED USE)
21. SKATING RINK (PROPOSED USE)
22. BOULDERING&CLIMBING WALL (PROPOSED USE)
23. SPIDER JUMP / AMUSEMENT (PROPOSED USE)
24. PLAYGROUND 777 (PROPOSED USE)
26. MONORAIL (EXISTING)
27. AERIAL ADVENTURE (PROPOSED USE)
28. TRAIL SYSTEM (EXISTING WITH PROPOSED ADDITION)
29. WATER FEATURES-SILVER SLIPPER POND & LADYBUG POND (EXISTING)
30. TREEHOUSE AERIAL ADVENTURE / PLAYSCAPE PROPOSED USE
31. COASTER BIKE PLAY AREA (PROPOSED USE)

BUILDING LEGEND

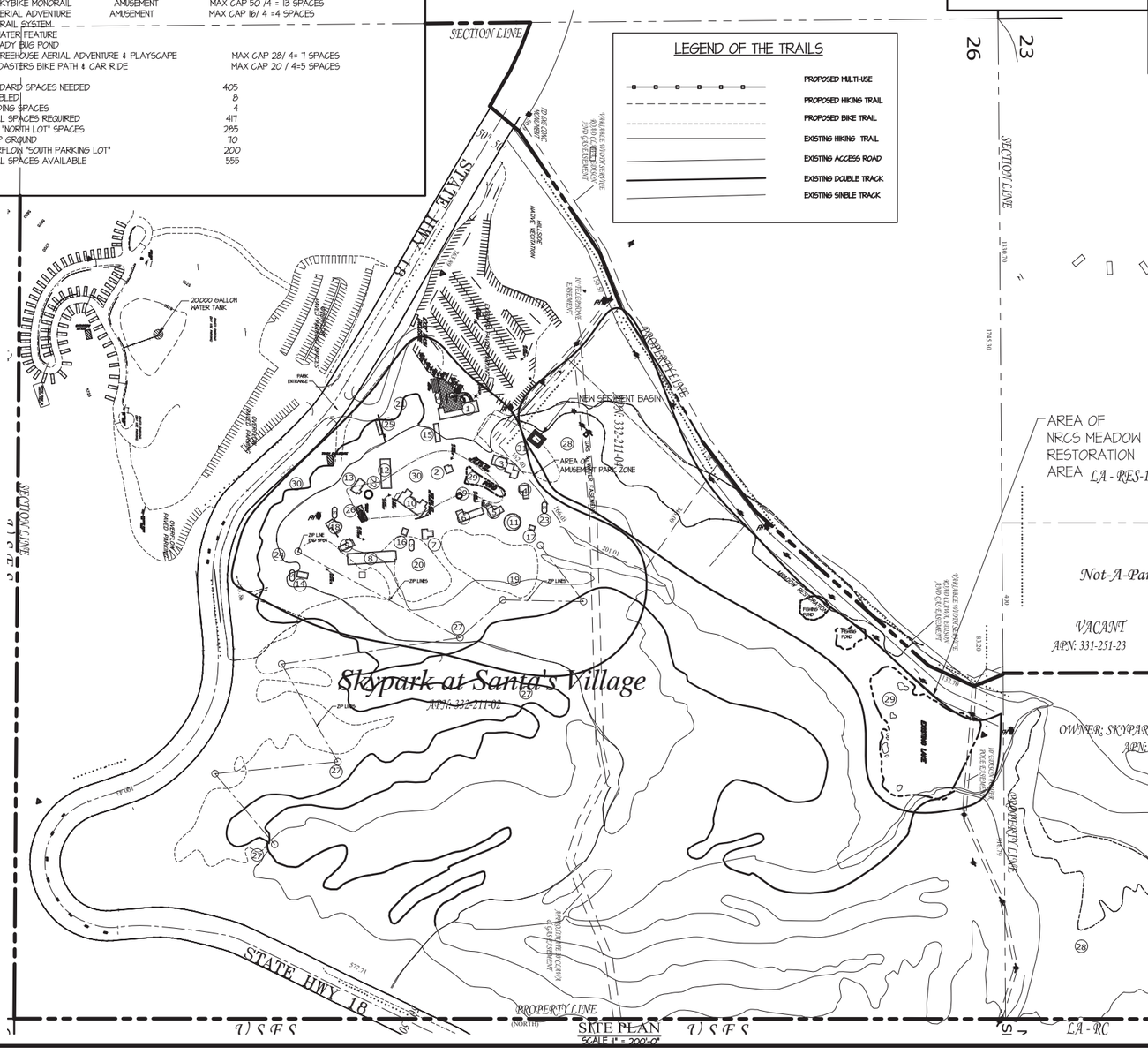
1	WELCOME HOUSE & GIFT SHOP RETAIL 2,122 S.F. EXISTING OFFICES 1,531 S.F. EXISTING	3,633 S.F.
2	SANTAS HOUSE EXISTING	288 S.F.
3	BILLIE'S PATIO RESTAURANT EXISTING	1,856 S.F.
4	PEDAL PUB / TAVERN EXISTING	688 S.F.
5	K' CANDY SHOP EXISTING	905 S.F.
6	THE GATHERING HOUSE EXISTING	1,328 S.F.
7	COFFEE & TEA HOUSE EXISTING	756 S.F.
8	SKYPARK ACTIVITY CENTER SECURITY OFFICE EXISTING	2,148 S.F. 1,227 S.F.
9	STONES THROW GAZEBO EXISTING	756 S.F.
10	SKY TRADING COMPANY EXISTING	2,952 S.F.
11	SKY PAVILLION EXISTING	1,723 S.F.
12	REINDEER BARN/RETAIL & CRAFTS EXISTING	1,950 S.F.
13	BOULDERING ROOM EXISTING	720 S.F.
14	MENS & WOMENS RESTROOM EXISTING	750 S.F.
15	MENS & WOMENS RESTROOM EXISTING	272 S.F.
16	PEBBLE MINE EXISTING	192 S.F.
17	CHAPEL EXISTING	272 S.F.
18	GOOD WITCH'S BAKERY/RESTAURANT EXISTING	990 S.F.

TOTAL = 23,084



VICINITY MAP

FOR OFFICIAL USE ONLY



SITE PLAN
SCALE 1" = 200'-0"

LEGEND OF THE TRAILS

- PROPOSED MULTI-USE
- PROPOSED HIKING TRAIL
- PROPOSED BIKE TRAIL
- EXISTING HIKING TRAIL
- EXISTING ACCESS ROAD
- EXISTING DOUBLE TRACK
- EXISTING SINGLE TRACK

DIG ALERT
CALL TOLL FREE
1-800-227-2600
AT LEAST TWO DAYS BEFORE YOU DIG
UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA

IMPORTANT NOTICE
Section 4216/4217 of the Government Code requires a Dig Alert Identification Number before excavation. Excavation will be void. For your Dig Alert I.D. Number Call Underground Service Alert
TOLL FREE 1-800-227-2600
Two working days notice.

NORTH

ASSESSOR'S PARCEL NUMBERS: 332-211-02, 04, 332-212-02, 331-251-24
APPLICANT: SKYPARK AT SANTA'S VILLAGE

ATTN: BILL JOHNSON
P.O. BOX 364
SKY FOREST, CA 92385
(951) 288-8182

A CUP FOR: SKYPARK AT SANTA'S VILLAGE
LEGAL DESCRIPTION

BEING A PORTION OF NW 1/4 SECTION 26, T2N, R5W, LYING NORTH OF STATE HIGHWAY EXCEPTING AS FOLLOWS:

COMMENCE AT NW CORNER NW 1/4, THENCE EAST ALONG NORTH LINE SAID SECTION 1745.3 FEET TO NWLY LINE 40 FEET RD, THENCE S22°06'E 89.2 FEET, THENCE S24°28'W 132.1 FEET, THENCE S41°40'W 615.6 FEET, THENCE S52°40'W 164.25 FEET, THENCE S50°46'E 346 FEET, THENCE S33°28'W 201.01 FEET THENCE S53°43'W 166.03 FEET, THENCE S46°51'W 162.40 FEET, THENCE N50°46'W 412.44 FEET, THENCE S68°36'W 150.51 FEET, THENCE S56°52'W 340.8 FEET TO NORTHERLY LINE STATE HIGHWAY, THENCE N74°28'W ALONG SAID NORTHERLY LINE HIGHWAY 50.9 FEET, THEN CONTINUE ALONG SAID NORTHERLY LINE HIGHWAY TO INTERSECTION WITH EAST LINE LOT M BLOCK 10 ARROWHEAD LAKE VIEW FOREST THENCE NORTH TO POINT OF BEGINNING.

(SEE TITLE REPORT FOR FULL LEGAL DESCRIPTION)

GENERAL INFORMATION

1. NO NEW BUILDINGS ARE PROPOSED TO BE ADDED TO THIS EXISTING AMUSEMENT PARK ESTABLISHED IN 1955 WITH THE EXCEPTION OF A RESTROOM BUILDING AT THE PROPOSED CAMPGROUND SITE ON THE SOUTH SIDE OF PROJECT. THERE ARE 19 EXISTING BUILDINGS (SEE BUILDING LEGEND). EXISTING PAVED PARKING LOTS, UTILITES, AND LANDSCAPING TO REMAIN 85% OF PROPERTY TO REMAIN UNDISTURBED OPEN SPACES.
2. LOT COVERAGE:
   BUILDINGS .69%
   LANDSCAPING 9.31%
   PAVING 10%
   OPEN SPACE 80%
   TOTAL 100.0%
3. NO TREES SHALL BE REMOVED IN THIS PROJECT. NO ENDANGERED OR PROTECTED PLANTS EXIST ONSITE.
4. FIRE SAFETY OVERLAY IS FR 2.
5. EXISTING GENERAL PLAN LAND USE DISTRICT, SPECIAL DEVELOPMENT-RES (SD-RES), & A SMALL PORTION LAKE ARROWHEAD RESIDENTIAL 14M (LA/RS-14M) PROPOSED LAND DISTRICT, RURAL COMMERCIAL (CR).

   PARKING FORMULA: AMUSEMENT PARK/RECREATION
   SEE PARKING ANAYSIS (ABOVE LEFT)
7. ALL EASEMENTS OF RECORD SHALL BE HONORED OR RELOCATED AS NECESSARY. NO SEE TITLE REORT FOR ALL EASEMENT OF RECORD.
8. SITE HAS NO DRAINAGE PROBLEMS &
9. THERE IS NO GRADING PROPOSED IN THIS PROJECT.
10. EXISTING NATURAL LANDSCAPING TO REMAIN
11. (SE) DENOTES EXISTING SEPTIC TANK LOCATION
13. FH DENOTES FIRE HYDRANT
14. SIGNAGE UNDER SEPARATE SUBMITTAL AND PERMIT. HOURS OF OPERATION 8 AM-10 PM

SITE DATA

REVISIONS

DATE:	BY:

JONATHAN L. ZANE
ARCHITECTURE
JONATHAN L. ZANE, ARCHITECT - CA. LIC. #C-11,046
456 NORTH LA CADENA DRIVE
COLTON, CA 92324 (909) 825-7500

LICENSED ARCHITECT
JONATHAN L. ZANE
NO. C11,046
REN. 8-31-15
STATE OF CALIFORNIA

DATE : plot date

A PROJECT FOR:
SKYPARK AT SANTA'S VILLAGE
LOCATED AT
SKY FORREST, CA. 92385
PROJECT MANAGER: BILL JOHNSON

APPLICABLE CODES:

2012 I.B.C.	2013 C.B.C.C.
2012 I.R.C.	2013 C.R.C.C.
2012 I.M.C.	2013 C.M.C.C.
2012 U.P.C.	2013 C.P.C.C.
2011 N.E.C.	2013 C.E.C.C.
2012 I.F.C.	2013 C.F.C.C.
	2013 Cali. Green Building Code
	2013 Cali. Energy Code

All new work shall comply with the applicable codes and state amendments.

DATE : --
SCALE : 1" = 100'-0"
DRAWN : Kenneth
JOB : --
SHEET :
C-1

Amusement Park Zone. The existing 40-foot monorail does not extend higher than existing old growth forest. This height restriction will ensure the visual setting of the forest will be retained.

Trails

Existing and proposed trails are described below and are depicted on Exhibit 5, *Existing and Proposed Trails*.

Fantasy Forest Trail

The Fantasy Forest Trail is an existing trail that was used as a nature trail during the parks original years of operation. The trail cuts across the back of the park and is depicted as an existing hiking trail on the trail map. It is within the boundary of the Amusement Park Zone as it will be open during the operating hours of the park and lit as a nightime forest walk. It would be the only trail available after sun down and is very limited in its proximity to the park and distance. The trail distance is approximately 1/4 mile and is an interactive lighting attraction at night.

Improvement to the Fantasy Forest Trail includes clearing as needed for a width of 36-48-inch wide and sections of up to 100 feet in length will be elevated on a plank walkway. Un-elevated segments of the trail will be surfaced with decomposed granite.

Multi-Use Trail

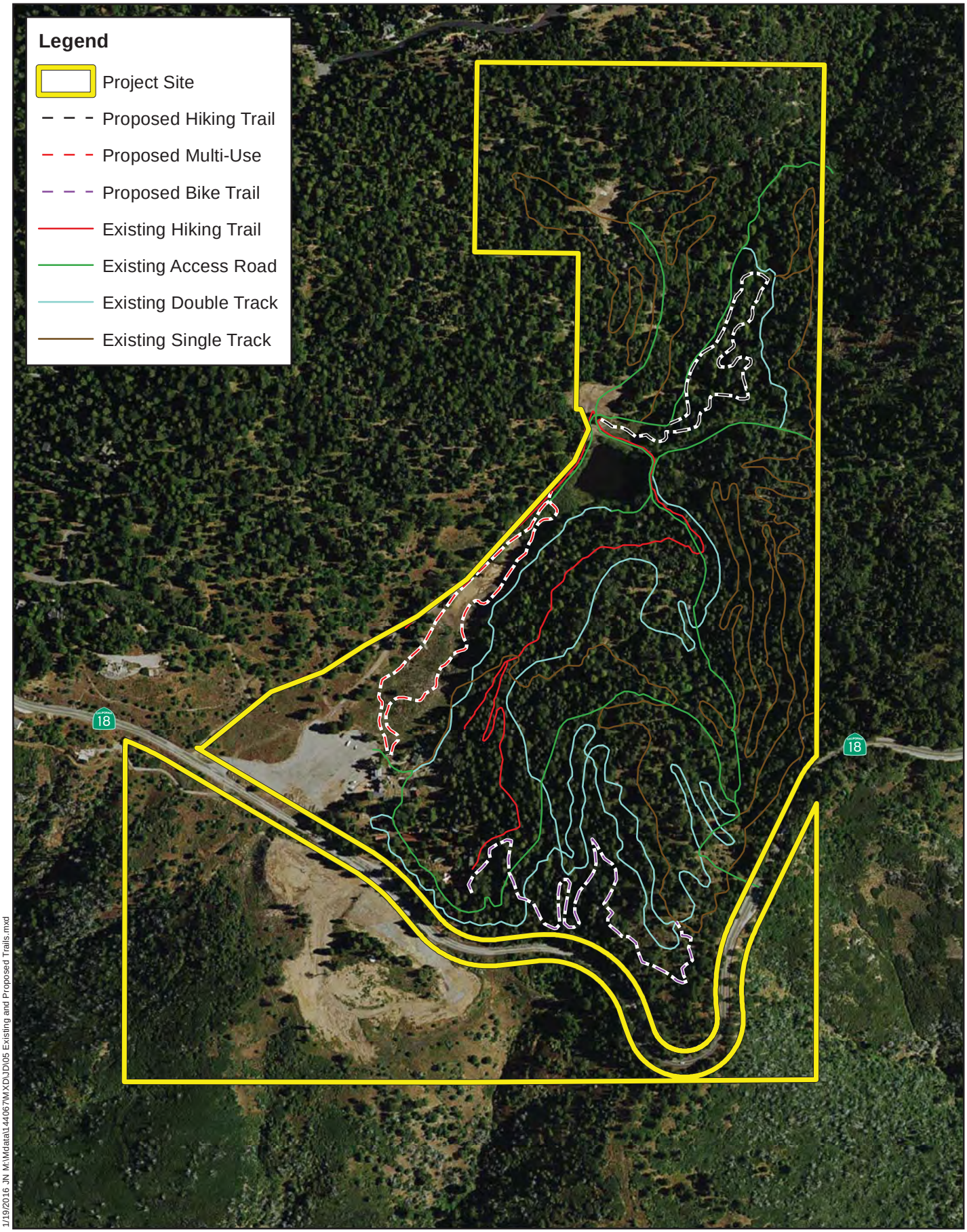
This is open for bicycle, wheel chair, pedal assist, and pedestrian traffic. This trail is specifically designed to accommodate special needs. It does not include motorized vehicles with the exception of electric assist vehicles for special needs. Construction techniques may include light weight track vehicles which include small backhoe and skid steer. It will be 5 feet to 8 feet maximum width, and surfaced with decomposed granite.

Hiking Trails

This is a special-use trail designed for hiking only. It is a single track trail not to exceed 36 inches in width. It will be used primarily for recreation; however, signage, fencing, and other forms of structures and materials will be used for educational purposes. The surface is the natural forest floor with the possible use of elevated walkways to prohibit soil disturbance in very wet conditions. Construction of these trails will be by hand tools and will McLeods, shovels, and rakes.

Mountain Bike Trail

This is a special-use trail for bicycles only. This trail is a single track trail designed for "one way" directional use. No double, side-by-side axle vehicles are allowed. Construction of these trails will be by hand tools and will include McLeods, shovels, and rakes. Special features are implemented, including log crossings, water bars for slope erosion, safety rail,



1/19/2016 JN M:\Mdata\144067\MXD\JD\05 Existing and Proposed Trails.mxd

SKYPARK AT SANTA'S VILLAGE
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

Existing and Proposed Trails

Michael Baker INTERNATIONAL

0 250 500 1,000 Feet

Source: San Bernardino County, Trail Map, ESRI World Imagery Basemap

Exhibit 5

and riding features such as protective berms and wood features.

Access Roads
This is a multi-use road for the continued purpose of accessing utility easements throughout the park. The road is a double wheel, side-by-side, 4-wheel drive roadway accessible to park guest, utility companies, and emergency vehicles. Most roads are dirt with the exception of some existing paved surfaces in the park and within property boundaries.

Existing Double Track
This is capable of holding a 4-wheel vehicle. Historically used for lumbering, emergency access and recreation. Existing double track trails have signage depicting their categorical use, many being multi-use trails including hiking, bicycle and emergency access use.

Existing Single Track
This is a special-use trail for bicycle use only. The trail system is "one way" directional traffic only. The width of the trail is closer to 24-inch and is constructed with hand tools to include McLeods, shovels, and rakes.

All of the trails will be maintained by hand tools. Techniques established by the U.S. Department of Agriculture, Forest Service (USFS) and the International Mountain Biking Association are implemented to reduce impacts to soils erosion, noise, off trail access and responsible forest practices.

Wilderness Adventure/Zipline and Aerial Park

This feature would include ziplines, rope courses, adventure swings, climbing walls, balance features, log crossings, and exploration trails. The Forest Zipline and tree house is estimated to be an average of 30 feet in height and approximately 1,200 feet in length; however the final designs would determine ultimate measurements. The tree house would have a zipline that is proposed to be approximately 16 feet high. A small children's zipline is proposed that would be approximately 8 feet high and 30 feet long. The tree house would be an engineered structure built among the trees. The final tree house platforms would either be constructed using a tree as the base or a standalone structure. Final design would be dependent on County approval.

Fly Fishing Lake and Stream

Fly-fishing clinics, guides and lessons, and fly-fishing instruction would be offered at the site's improved and existing reservoir/pond system. The on-site ponds and steam, Silver Slipper Pond and Lady Bug Pond within the rehabilitated meadow, would be stocked with fish per the California Department of Fish & Wildlife as permitted. Historically the pond has been stocked with trout. Trout fishing would be provided for catch and keep, or release as the guest wishes.

Hiking and Tours

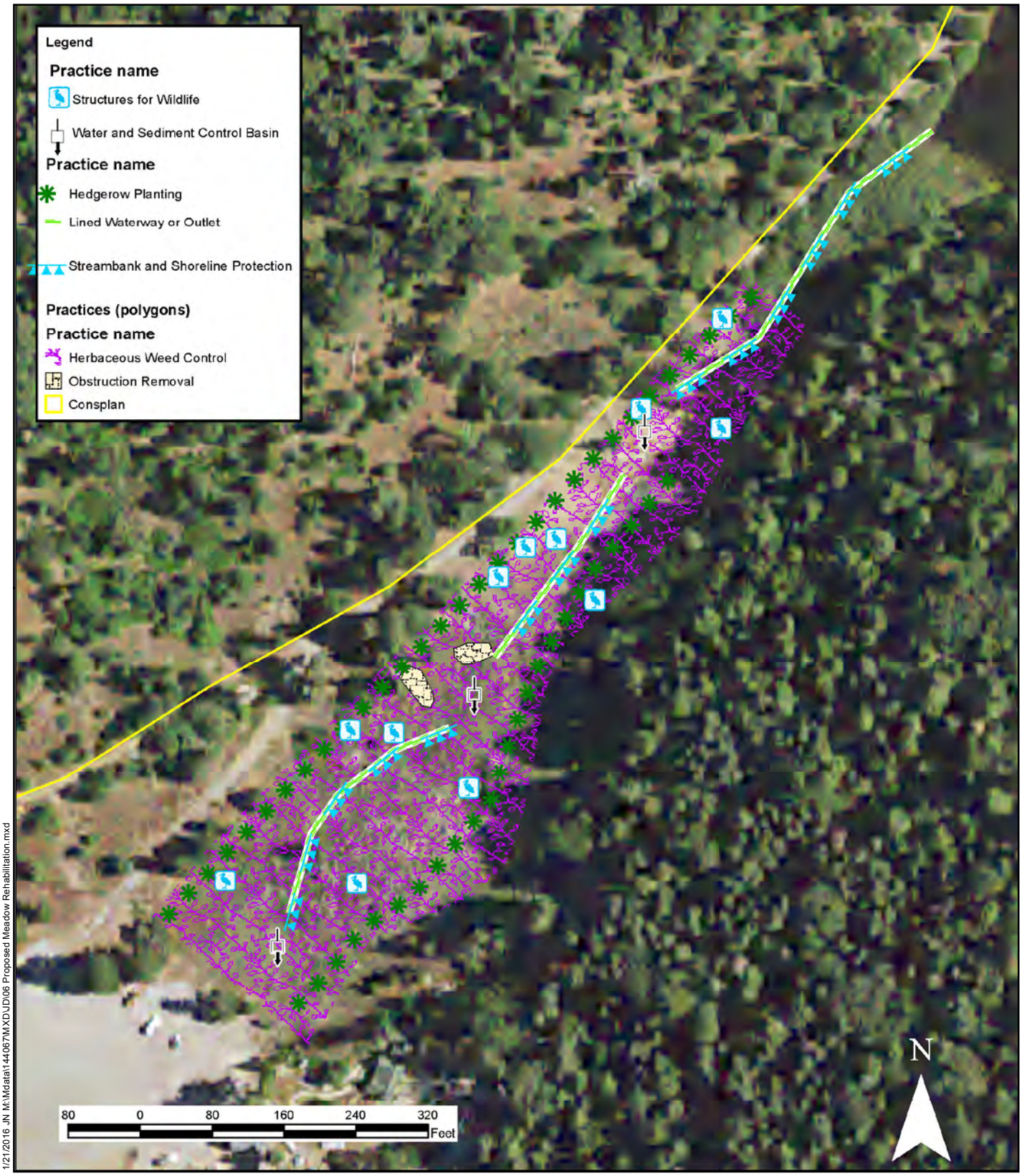
Eco-tours, education, and wildlife viewing will be offered. The project will promote wildlife and habitat education. Job skills will be introduced through "Pathways," an ongoing Regional Occupational Program through local school districts. Ecotourism involving bird watching blinds, trails, and assisted programs will be implemented to educate the public and students on the importance of wildlife preservation.

Campground Site

A campground is proposed to be located south of SR-18. Minor grading will be required to improve the existing dirt road to provide access to and create 70 RV sites and approximately 35 tent campsites within the 20-acre campground. A restroom will be constructed on the campground site and will utilize a septic system that will be sized per restroom requirements and will have a tank with a leach field in the same design standards as the existing septic systems in the Santa's Village site. The chambers that separate the solids are pumped out periodically as needed. The proposed campground restroom building will be approximately 1,450-1,500 square feet. It will include 2 laundry units, 2 urinals, 8 toilets, 6 showers (4 standard and 2 handicap), and 8 wash basins/sinks.

Meadow Rehabilitation

The project also includes the removal of waste from the site as well as the restoration and improvement of the upstream portions of Hook Creek (Exhibit 6, *Proposed Meadow Rehabilitation*). Previously, the project site was used as a storage site for wood material infested by bark beetles, which left the site with debris, woodchips, firewood, bark, and trash. The project would include restoring the watercourse that would allow for expansion and preservation of the meadow by a water aeration system controlled daily by the use of a solar array and water pumps. Ultimately, improvements to the health, beauty, and natural resources of the project area will be guided by the NRCS in cooperation with CDFW and the Lahontan Regional Board, and will result in a balanced ecosystem that will be created for education, recreation, and wildlife.



1/21/2016 JN M:\Mdata\144067\MXD\JD\06 Proposed Meadow Rehabilitation.mxd

SKYPARK AT SANTA'S VILLAGE PROJECT
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

Proposed Meadow Rehabilitation

Michael Baker INTERNATIONAL

Source: San Bernardino County, United States Department of Agriculture

Exhibit 6

Section 2 Regulations

There are three key agencies that regulate activities within inland streams, wetlands, and riparian areas in California. The Corps Regulatory Division regulates activities pursuant to Section 404 of the Federal Clean Water Act (CWA), Section 10 of the Rivers and Harbors Act, and Section 103 of the Marine Protection, Research, and Sanctuaries Act. The Regional Board regulates activities pursuant to Section 401 of the CWA and the California Porter-Cologne Water Quality Control Act and the CDFW regulates activities under the Sections 1600 *et seq*. of the Fish and Game Code.

2.1 U.S. ARMY CORPS OF ENGINEERS

Since 1972, the Corps and U.S. Environmental Protection Agency (EPA) have jointly regulated the discharge of dredged or fill material into waters of the United States, including wetlands, pursuant to Section 404 of the CWA. The Corps and EPA define "fill material" to include any "material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States." Examples include, but are not limited to, sand, rock, clay, construction debris, wood chips, and "materials used to create any structure or infrastructure in the waters of the United States." The terms *waters of the United States* and *wetlands* are defined under CWA Regulations 33 Code of Federal Regulations (CFR) §328.3 (a) through (b) and within Appendix B of this report.

2.2 NATURAL RESOURCES CONSERVATION SERVICE

The Highly Erodible Land Conservation and Wetland Conservation Compliance provisions (Swampbuster) were introduced in the 1985 Farm Bill, with amendments in 1990, 1996 and 2002. The purpose of the provisions is to remove certain incentives to produce agricultural commodities on converted wetlands or highly erodible land, unless the highly erodible land is protected from excessive soil erosion.

In order to determine compliance with the swampbuster provisions, the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) will determine if a producer's land has wetlands that are subject to the provisions. The agency maintains a list of the plants and combinations of soils and plants found in wetlands and uses these technical tools, along with the hydrology of the area, to conduct determinations. These determinations stay in effect as long as the land is used for agricultural purposes or until the producer requests a review.

Swampbuster helps preserve the environmental functions of wetlands, such as flood control, sediment control, groundwater recharge, water quality, wildlife habitat, recreation, and esthetics.

Grant funding is available through the Wetlands Reserve Enhancement Program administered by the USDA NRCS. The purpose of the program is to restore and protect wetland habitat through cooperative agreements with partner organizations. Nongovernmental organizations, American Indian tribes, and state and local governments are eligible to apply for grants on a competitive basis. The Wetlands Reserve Program provides financial assistance to landowners for restoring wetlands converted to agricultural production back to wetland habitat. Landowners can also sell long-term or permanent development rights to the restored wetlands to the USDA. Wetlands provide valuable wildlife habitat and help improve water quality among other conservation benefits.

2.3 REGIONAL WATER QUALITY CONTROL BOARD

Pursuant to Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity which may result in any discharge to waters of the United States must provide certification from the State or Indian tribe in which the discharge originates. This certification provides for the protection of the physical, chemical, and biological integrity of waters, addresses impacts to water quality that may result from issuance of federal permits, and helps insure that federal actions will not violate water quality standards of the State or Indian tribe. In California, there are nine Regional Boards that issue or deny certification for discharges to waters of the United States and waters of the State, including wetlands, within their geographical jurisdiction. The State Water Resources Control Board assumed this responsibility when a project has the potential to result in the discharge to waters within multiple Regional Boards.

Additionally, the California Porter-Cologne Water Quality Control Act gives the State very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. The Porter-Cologne Water Quality Control Act has become an important tool post *Solid Waste Agency of Northern Cook County v. United States Corps of Engineers*[2] and *Rapanos v. United States*[3] (Rapanos) court cases with respect to the State's authority over isolated and insignificant waters. Generally, any applicant proposing to discharge waste into a water body must file a Report of Waste Discharge in the event that there is no Section 404/401 nexus. Although "waste" is partially defined as any waste substance associated with human habitation, the Regional Board also interprets this to include discharge of dredged and fill material into water bodies.

2 Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001)
3 Rapanos v. United States, 547 U.S. 715 (2006)

2.4 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Section 1600 *et seq.* of the Fish and Game Code establishes a fee-based process to ensure that projects conducted in and around lakes, rivers, or streams do not adversely impact fish and wildlife resources, or, when adverse impacts cannot be avoided, ensures that adequate mitigation and/or compensation is provided. Pursuant to Section 1602 of the Fish and Game Code, a notification must be submitted to the CDFW for any activity that will divert or obstruct the natural flow or alter the bed, channel, or bank (which may include associated biological resources) of a river or stream or use material from a streambed. This includes activities taking place within rivers or streams that flow perennially or episodically and that are defined by the area in which surface water currently flows, or has flowed, over a given course during the historic hydrologic regime, and where the width of its course can reasonably be identified by physical and biological indicators.

Section 3 Methodology

The analysis presented in this report is supported by field surveys and verification of site conditions conducted on November 20, 2014 and September 23, 2015. Michael Baker biologists Travis J. McGill, Ryan S. Winkleman, and Thomas C. Millington conducted a site investigation to determine the jurisdictional limits of "waters of the United States" and "waters of the State" (including potential wetlands and vernal pools), located within the boundaries of the project site. While in the field, jurisdictional features were recorded on a base map at a scale of 1" = 50' using topographic contours and visible landmarks as guidelines. A Garmin Map62 Global Positioning System was used to record and identify specific widths/lengths of ordinary high water mark (OHWM) indicators and the locations of photograph points, soil pits, and other pertinent jurisdictional features, if present. This data were then transferred as a .shp file and added to the Project's jurisdictional exhibit. The jurisdictional exhibit was prepared using ESRI ArcInfo Version 10 software.

3.1 WATERS OF THE UNITED STATES

In the absence of adjacent wetlands, the limits of the Corps' jurisdiction in non-tidal waters extend to the OHWM, which is defined as " . . . *that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*"[4] Indicators of an OHWM are defined in *A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States* (Corps 2008). An OHWM can be determined by the observation of a natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; presence of litter and debris; wracking; vegetation matted down, bent, or absent; sediment sorting; leaf litter disturbed or washed away; scour; deposition; multiple observed flow events; bed and banks; water staining; and/or change in plant community. The Regional Board shares the Corps' jurisdictional methodology, unless SWANCC or Rapanos conditions are present. In the latter case, the Regional Board considers such drainage features to be jurisdictional waters of the State.

Pursuant to the Corps Wetland Delineation Manual (Corps 1987), the identification of wetlands is based on a three-parameter approach involving indicators of hydrophytic vegetation, hydric soils, and wetland hydrology. In order to qualify as a wetland, a feature must exhibit at least minimal characteristics within each of these three parameters. It should also be noted that both the Regional Board and CDFW follow the methods utilized by the Corps to indentify wetlands. For this project location, Corps jurisdictional wetlands are delineated using the methods

[4] CWA regulations 33 CFR §328.3(e).

outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2* (Corps 2008).

3.2 WATERS OF THE STATE

3.2.1 REGIONAL WATER QUALITY CONTROL BOARD

Pursuant to Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity which may result in any discharge to waters of the United States must provide certification from the State or Indian tribe in which the discharge originates. This certification provides for the protection of the physical, chemical, and biological integrity of waters, addresses impacts to water quality that may result from issuance of federal permits, and helps insure that federal actions will not violate water quality standards of the State or Indian tribe. In California, there are nine Regional Boards that issue or deny certification for discharges to waters of the United States and waters of the State, including wetlands, within their geographical jurisdiction. The State Water Resources Control Board assumed this responsibility when a project has the potential to result in the discharge to waters within multiple Regional Boards.

Additionally, the California *Porter-Cologne Water Quality Control Act* gives the State very broad authority to regulate waters of the State, which are defined as any surface water or groundwater, including saline waters. The Porter-Cologne Water Quality Control Act has become an important tool post *Solid Waste Agency of Northern Cook County vs. United States Corps of Engineers*[5] (SWANCC) and *Rapanos v. United States*[6] (Rapanos) court cases with respect to the State's regulatory authority over isolated and insignificant waters. The Regional Board shares the Corps' methodlogy for delineating the limits of jurisdiction based on the identification of an OHWM and utilizing the three parameter approach for wetlands. Generally, any applicant proposing to discharge waste into a water body must file a Report of Waste Discharge in the event that there is no Section 404/401 nexus. Although "waste" is partially defined as any waste substance associated with human habitation, the Regional Board also interprets this to include discharge of dredged and fill material into water bodies.

3.2.2 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Section 1600 *et seq*. of the Fish and Game Code applies to all perennial, intermittent, and ephemeral rivers, streams, and lakes in the State. Generally, the CDFW's jurisdictional limit is not defined by a specific flow event, nor by the presence of OHWM indicators or the path of surface water as this path might vary seasonally. Instead, CDFW's jurisdictional limit is based on the topography or elevation of land that confines surface water to a definite course

5 Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 531 U.S. 159 (2001)
6 Rapanos v. United States, 547 U.S. 715 (2006)

when the surface water rises to its highest point. Further, the CDFW's jurisdictional limit extends to include any habitat (e.g. Riversidean alluvial fan sage scrub, riparian, riverine), including wetlands, supported by a river, stream, or lake regardless of the presence or absence of hydric soils and saturated soil conditions. For this project location, CDFW jurisdictional limits were delineated using the methods outlined in the *MESA Field Guide* (CDFW 2014) and *A Review of Stream Processes and Forms in Dryland Watersheds* (CDFW 2010), which were developed to provide guidance on the methods utilized to describe and delineate episodic streams within the inland deserts region of southern California.

Section 4 Literature Review

Michael Baker conducted a thorough review of relevant literature and materials to preliminarily identify areas that may fall under the jurisdiction of the regulatory agencies. A summary of materials utilized during Michael Baker's literature review is provided below and in Appendix C. In addition, refer to Section 8 for a complete list of references used throughout the course of this delineation.

4.1 WATERSHED REVIEW

4.1.1 MOJAVE WATERSHED

Hooks Creek and Drainage 1 are located within the Mojave River Watershed (Hydrologic Unit Code 18090208) which encompasses approximately 4,500 square miles and is located entirely within the County of San Bernardino. The watershed is divided into five sub-basins: (1) Headwaters – tributaries above the Mojave Forks Dam; (2) Upper Basin – Mojave Forks Dam to the Lower Narrows at Victorville; (3) Middle Basin – Lower Narrows to the Waterman Fault at Barstow; (4) Lower Basin – Waterman Fault to Afton Canyon; and (5) Tailwater – Afton Canyon to Silver Dry Lake. The primary surface hydrologic feature of the watershed is the Mojave River which originates at its headwaters in the San Bernardino Mountains and flows north for approximately 120 miles until it terminates at Silver Dry Lake near the community of Baker. The Mojave River is typically dry downstream of the Mojave Forks Dam with water quickly percolating into the porous sands of the riverbed. As a result, groundwater is the primary source of water supply.

4.1.2 SANTA ANA RIVER WATERSHED

Drainages 2 and 3 are located within the Santa Ana River Watershed (HUC 18070203). The Santa Ana River watershed is located in southern California, south and east of the city of Los Angeles. The watershed includes much of Orange County, the northwestern corner of Riverside County, the southwestern corner of San Bernardino County, and a small portion of Los Angeles County. The watershed is bounded on the south by the Santa Margarita watershed, on the east by the Salton Sea and Southern Mojave watersheds, and on the north/west by the Mojave and San Gabriel watersheds. The watershed is approximately 2,800 square miles in area.

The Santa Ana River watershed is located in the Peninsular Ranges and Transverse Ranges Geomorphic Provinces of Southern California (California Geological Survey Note 36). The highest elevations (upper reaches) of the watershed occur in the San Bernardino Mountains (San Gorgonio Peak – 11,485 feet in elevation), eastern San Gabriel Mountains (Transverse Ranges Province; Mt. Baldy – 10,080 feet in elevation), and San Jacinto Mountains (Peninsular

Ranges Province, Mt. San Jacinto – 10,804 feet in elevation). Further downstream, the Santa Ana Mountains and the Chino Hills form a topographic high before the river flows into the Coastal Plain (in Orange County) and into the Pacific Ocean. Primary slope direction is northeast to southwest, with secondary slopes controlled by local topography.

This watershed is in an arid region, and therefore has little natural perennial surface water. Surface waters start in the upper erosion zone of the watershed, primarily in the San Bernardino and San Gabriel Mountains. This upper zone has the highest gradient and soils/geology that do not allow large quantities of percolation of surface water into the ground. Flows consist mainly of snowmelt and storm runoff from the lightly developed San Bernardino National Forest; this water is generally high quality at this point. In this zone, the Santa Ana River is generally confined in its lateral movement, contained by the slope in the mountainous regions. In the upper valley, flows from the Seven Oaks dam to the city of San Bernardino consist mainly of storm flows, flows from the San Timoteo Creek, and groundwater that is rising due to local geological conditions. From the City of San Bernardino to the City of Riverside, the river flows perennially, and it includes treated discharges from wastewater treatment plants. From the City of Riverside to the recharge basins below Imperial Highway, river flow consists of highly treated wastewater discharges, urban runoff, irrigation runoff, and groundwater forced to the surface by shallow/rising bedrock. Near Corona, the river cuts through the Santa Ana Mountains and the Puente-Chino Hills. The river then flows into the Orange County Coastal Plain; the channel lessens and the gradient decreases. In a natural environment, a river in this area would have a much wider channel, increased meandering, and increased sediment build-up. However, much of the Santa Ana River channel in this area has been contained in concrete-lined channels, which modifies the flow regime and sediment deposition environment. The only major tributary of the Santa Ana River in Orange County is Santiago Creek, which joins the river in the City of Santa Ana. There is only one natural freshwater lake of any size – Lake Elsinore. A variety of water storage reservoirs (Lake Perris, Lake Mathews, and Big Bear Lake) and Flood Control areas (Prado Dam area and Seven Oaks Dam area) have been created to hold surface water.

4.2 LOCAL CLIMATE

San Bernardino County features a somewhat cooler version of a Mediterranean climate, or semi-arid climate, with warm, sunny, dry summers and cool, rainy, mild winters. Relative to other areas in southern California, winters are colder with frost and with chilly to cold morning temperatures common. Climatological data obtained from nearby weather stations indicates the annual precipitation averages 16.4 inches per year. Almost all of the precipitation in the form of rain occurs in the months between October and April, with hardly any occurring between the months of May and September. The wettest month is February, with a monthly average total precipitation of 3.7 inches. The average maximum and minimum temperatures for the region are 80.1 and 51.2 degrees Fahrenheit (°F) respectively with July and August

(monthly average 96°F) being the hottest months and December (monthly average 41°F) being the coldest.

4.3 USGS TOPOGRAPHIC QUADRANGLE

The project site is located within the Harrison Mountain quadrangle of the USGS 7.5-minute topographic map series in Sections 26 of Township 2 north, Range 3 west. Surface elevations within the project site ranges from approximately 5,660 to 5,730 feet above mean sea level and generally slopes to the northeast. The southern portion of the project site, south of SR 18, abuts the steep south-facing mountain face of the San Bernardino Mountains. According to the topographic map, the project site is comprised of multiple structure and vacant/undeveloped land within the San Bernardino National Forest. Hooks Creek is depicted as a blue-line stream and generally runs south to north. Two (2) ponds and Hencks Meadow is located on the central portion of the project site. Additionally, two (2) ephemeral drainage features are depicted within the project site, south of SR 18 (Drainage 2 and Drainage 3).

4.4 AERIAL PHOTOGRAPHS

Prior to the field visit, Michael Baker reviewed current and historical aerial photographs (1994-2015) of the project site as available from Google Earth Pro Imaging (Version 7.1.2.2041). Aerial photographs can be useful during the delineation process, as the photographs often indicate the presence of drainage features, ponded areas, and variations in plant communities, if any.

1994 – 2015: According to the 1996 through 2015 aerial photographs, the project site appears to consist of the Santa's Village theme park and vacant/undeveloped land within the San Bernardino National Forest. Surrounding land uses consist of single-family residential lots, roadways, and vacant/undeveloped land.

4.5 SOIL SURVEY

Soils within and adjacent to the project site were researched prior to the field visit using the U.S. Department of Agriculture (USDA), Soil Conservation Service, the NRCS, and Custom Soil Resource Report for the San Bernardino National Forest Area. The presence of hydric soils is initially investigated by comparing the mapped soil series for the site to the County list of hydric soils. Data from soil surveys is used to create soil maps and interpretations that were originally used to provide technical assistance to farmers and ranchers; to guide other decisions about soil selection, use, and management; and to assist in planning, research, and ultimately disseminating the results of the research. In addition, soil surveys are now heavily utilized in order to obtain soil information with respect to potential wetland environments and

jurisdictional areas (e.g. soil characteristics, drainage, and color). According to the Custom Soil Resource Report, the project site is underlain by the following soil units: Morical-Wind River Families Complex (15 to 30 percent slopes); Morical-Wind River Families Complex (30 to 50 percent slopes); and Springdale Family-Lithic Xerorthents Association, dry (50 to 75 percent slopes). Refer to Exhibit 7, *Soils*.

4.6 HYDRIC SOILS LIST OF CALIFORNIA

Michael Baker reviewed the National Hydric Soils List for the State of California (NRCS 2015), in an effort to verify whether or not on-site soils are considered to be hydric. It should be noted that lists of hydric soils and soil survey maps provide off-site ancillary tools to assist with wetland determinations, but are not a substitute for on-site investigations. According to the hydric soils list, none of the on-site soil types have been listed as hydric in the State of California.

4.7 NATIONAL WETLANDS INVENTORY

Michael Baker reviewed the U.S. Fish and Wildlife Service's (USFWS) National Wetland Inventory maps. Three (3) freshwater ponds have been documented within the project site. No additional features are listed as occurring on-site. Refer to Appendix C, *Documentation*.

4.8 FLOOD ZONE

Michael Baker searched the Federal Emergency Management Agency website for flood data for the project site. Based on the Flood Insurance Rate Map No. 06071C7956H, the project site is within Zone X, or areas outside of the 1% (100-year) flood plain. Refer to Appendix C, *Documentation*.

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SKYPARK AT SANTA'S VILLAGE PROJECT
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

Michael Baker INTERNATIONAL

0 275 550 1,100 Feet

Source: San Bernardino County, NRCS Soils Data Mart-CA777, Eagle Aerial 2013

Soils

Exhibit 7

Section 5 Site Conditions

Michael Baker biologists Thomas C. Millington and Travis J. McGill conducted a field investigation of the project site on November 20, 2014 and September 22, 2015 to verify existing site conditions and document potential jurisdictional areas. Michael Baker field staff encountered no limitations during the site visits. Exhibits 8 and 9 depict the mapped jurisdictional features on-site. Refer to Appendix A for representative photographs taken throughout the project site.

The majority of the project site is undeveloped, consisting of naturally occurring habitats which will continue to remain undeveloped. Dirt fire access roads traverse the site. These existing dirt access roads are proposed to be used for various mountain biking/hiking trail activities. The developed portions of the project site include existing buildings and infrastructure associated with the Santa's Village Amusement Park that opened in 1955. The various buildings associated with the amusement park have remained intact since the park's closure in 1998. The proposed new land use will renovate these existing buildings.

After the park's closure, the parking lot on the north side of SR-18 (western portion of the project site) and the overflow parking lot south of SR-18 (southern portion of the project site) provided a storage yard and staging area for bark beetle infested lumber. The infested wood was chipped and spread out over the paved parking lots.

5.1 DRAINAGE FEATURES

5.1.1 HENCKS MEADOW AND HOOKS CREEK

Hooks Creek is the primary hydrogeomorphic feature found on-site and generally flows in a southwest to northeast direction. Hooks Creek originates at SR-18 near the southwestern corner of the property and extends along the western boundary of the site before it exists near the northeastern corner of the property. From its origin at SR-18 Hooks Creek sheet flows for approximately 700 feet across the existing paved parking lot of Santa's village before flowing into Hencks Meadow at the uppermost reach of Hooks Creek, where Hooks Creek then becomes an earthern drainage feature. Hooks Creek extends through Hencks Meadow for approximately 530 feet before it continues for approximately 420 feet through the area previously disturbed when it was used as a storage yard and staging area for the bark beetle infested lumber. After the disturbed area, Hooks Creek extends through a southern willow scrub plant community for approximately 270 feet before entering into the existing pond created by the previous owner for water storage. The pond is approximately 1 acre in size. Downstream (north) of the pond, the creek runs through a mixed conifer forest and varies

between being generally open and covered in vegetation for approximately 1,300 feet before exiting the property.

Following significant storm events, surface flows collected within the pond and are anticipated permeate downstream within Hooks Creek via the high water table and then continue downstream to Deep Creek.

Generally, the ordinary high water mark (OHWM) ranged from 2 to 8 feet in width and was documented through the observation of the following indicators: flow patterns; drift deposits; saturation; and substrate characteristics. Due to historic on-site land uses (timber farm), the upstream portions of Hooks Creek are heavily disturbed and covered with remnant debris from the processing and staging of timber. Within Hencks Meadow is vegetated with fragmented patches of riparian vegetation including arroyo willow (*Salix lasiolepis*; FACW), mulefat (*Baccharis salicifolia*; FAC), fragrant everlasting (*Pseudognaphalium beneolens*; UPL), slender leaved sedge (*Carex athrostachya*; FACW), Pacific rush (*Juncus effuses* ssp. *pacificus*; FACW), and cattail (*Typha lytafolia*; OBL). Further downstream, immediately upstream (south) of the existing on-site pond, Hooks Creek becomes more densely vegetated and supports a southern willow scrub plant community. Plant species observed within this community include arroyo willow, stinging nettle (*Urtica dioica*; FAC), sticktight (*Bidens frondosa*; FACW), northern water plantain (*Alisma triviale*; OBL), horehound (*Marrubium vulgare*; FACU), and watercress (*Nasturtium officinale*; OBL).

Hooks Creek and tributary to Deep Creek (Relatively Permanent Water) and ultimately the Mojave River (Traditional Navigable Water) and falls under the regulatory authority of the Corps, Regional Board, and CDFW. Portions of Hencks Meadow and the southern (upper) reach of Hooks Creek, north of the existing on-site poind, will be impacted from the meadow rehabilitation activities. These impacts are further described in Section 6 below.

5.1.2 DRAINAGE 1 (D-1)

Drainage 1 is an earthern drainage feature that generally flows from southeast to northwest from the project's northeastern boundary for approximately 450 feet before converging into Hooks Creek. The OHWM ranged from 2 to 6 feet in width and was documented through the observation of the following indicators: flow patterns; drift deposits; saturation; and substrate characteristics. Drainage 1 flows through the mixed conifer forest and varies between being generally open and covered in vegetation. No impacts to Drainage 1 will occur as a result of installation of the proposed trials.

5.1.3 DRAINAGE 2 (D-2)

Drainage 2 is an earthern drainage feature located on the northwest portion of the property south of SR-18 west of the proposed campground. Drainage 2 generally flows in a northeast to southwest direction from SR-18 for approximately 850 feet down the south-facing slope of the San Bernardino Mountains via topography and is depicted as a blueline stream on USGS topographic maps. The OHWM ranged from 1 to 4 feet in width and was documented through the observation of the following indicators: flow patterns; drift deposits; saturation; and substrate characteristics. Drainage 2 flows through the chaparral plant community.

Drainage 2 flows south into City Creek which is tributary to the Santa Ana River (Relatively Permanent Water) and ultimately the Pacific Ocean (Traditional Navigable Water) and falls under the regulatory authority of the Corps, Regional Board, and CDFW. No impacts to Drainage 2 will occur as a result of installation of the proposed campground south of SR-18.

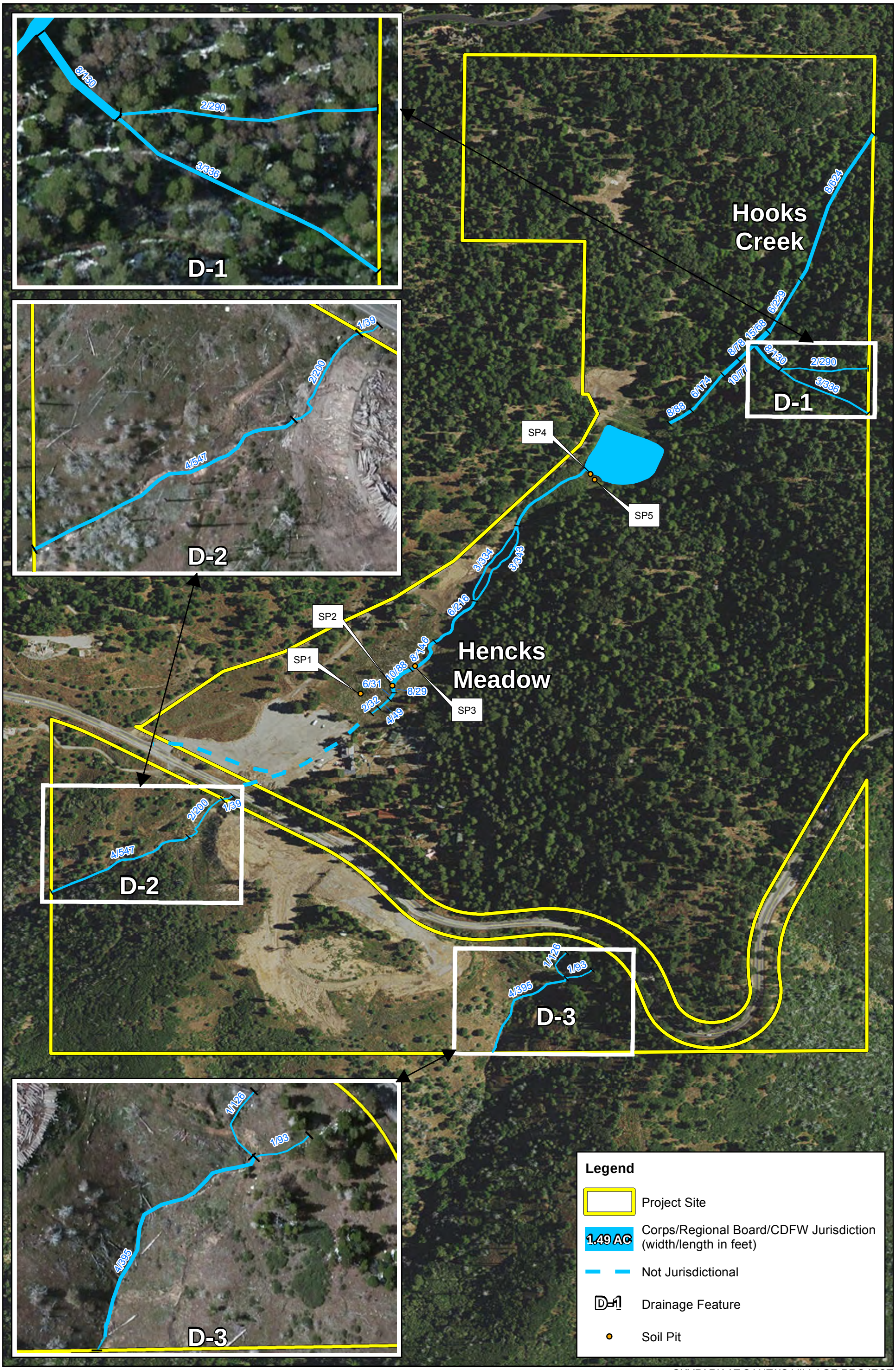
5.1.4 DRAINAGE 3 (D-3)

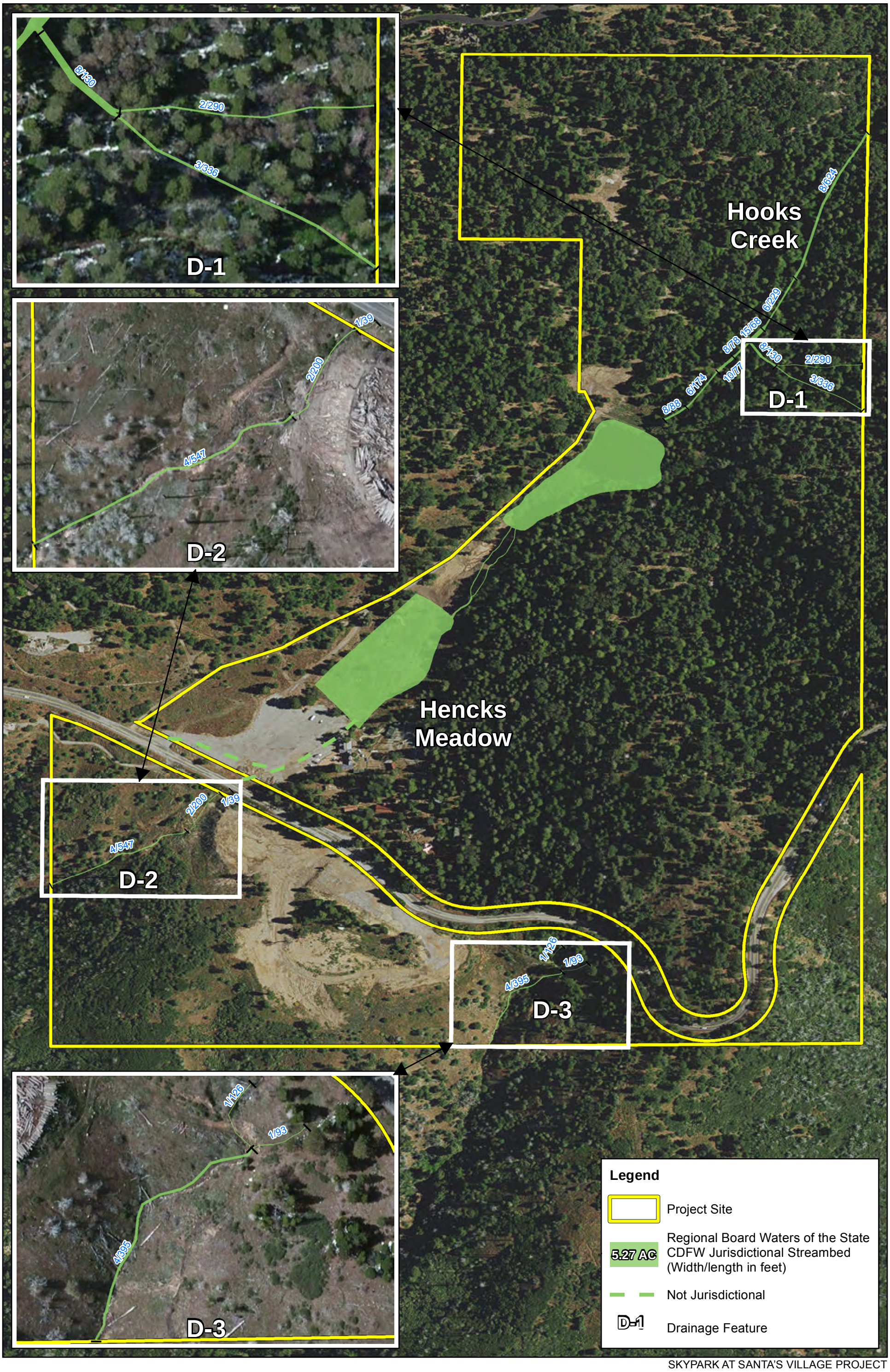
Drainage 3 is an earthern drainage feature located on the southeast portion of the property south of SR-18 east of the proposed campground. Drainage 3 generally flows in a north to south direction from SR-18 for approximately 500 feet down the south-facing slope of the San Bernardino Mountains via topography and is depicted as a blueline stream on USGS topographic maps. The OHWM ranged from 1 to 4 feet in width and was documented through the observation of the following indicators: flow patterns; drift deposits; saturation; and substrate characteristics. Drainage 2 flows through the chaparral plant community.

Drainage 3 flows south into City Creek which is tributary to the Santa Ana River (Relatively Permanent Water) and ultimately the Pacific Ocean (Traditional Navigable Water) and falls under the regulatory authority of the Corps, Regional Board, and CDFW. No impacts to Drainage 3 will occur as a result of installation of the proposed campground.

5.2 WETLAND FEATURES

In order to qualify as a federal wetland, a feature must exhibit at least minimal characteristics within each of the three wetland parameters described in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps 2008). Based on the results of the field investigation and soil pit data the only area that met all three wetland parameters is a small fringe wetland on the southern border of the existing on-site pond. When water levels are low in the pond, hydrophytic vegetation is able to establish on the banks of the on-site pond, and anaerobic soil conditions form resulting in a wetland on the boundary of the on-site pond. No impacts to this area will occur from project implementation.


D-1
8/130
2/290
3/336
D-2
1/39
2/200
4/547
D-3
1/126
1/93
4/395
Hooks Creek
8/624
6/229
15/68
8/78
10/77
6/174
8/88
SP4
SP5
3/334
3/343
6/216
3/146
SP2
SP1
SP3
Hencks Meadow
10/88
6/31
8/29
2/32
4/49
Legend
Project Site
1.49 AC
Corps/Regional Board/CDFW Jurisdiction (width/length in feet)
Not Jurisdictional
Drainage Feature
Soil Pit
0
175
350
700
Feet
Source: San Bernardino County, ESRI World Imagery
Michael Baker INTERNATIONAL
3/8/2017 JN M:\Mdata\144067\MXD\JD\08 JDv4.mxd
SKYPARK AT SANTA'S VILLAGE PROJECT
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS
Corps Jurisdictional Areas
Exhibit 8



3/7/2017 JN M:\Mdata\144067\MXD\JD\09 Waters of the State (2).mxd

Michael Baker INTERNATIONAL

0 175 350 700 Feet

Source: San Bernardino County, ESRI World Imagery

SKYPARK AT SANTA'S VILLAGE PROJECT
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

Regional Board/CDFW Jurisdictional Areas

Exhibit 9

Section 6 Findings

This delineation has been prepared for the proposed project in order to document the jurisdictional authority of the Corps, Regional Board, and CDFW within the boundaries of the project site. This report presents Michael Baker's best effort at determining the extent of jurisdictional features using the most up-to-date regulations, written policy, and guidance from the regulatory agencies. Ultimately the regulatory agencies make the final determination of jurisdictional boundaries.

No impacts to Hooks Creek, or Drainages 1-3 are anticipated from installation of the proposed trials, except within the meadow area. Construction of proposed new trails outside of the meadow, but within the project site, will avoid impacts to jurisdictional waters. The existing trials within the project site will generally be left in a "rough" state, unpaved and with brush cleared and overhanging vegetation trimmed. No dredging or fill material will be placed in any of the jurisdictional features outside of the meadow area on-site. Any proposed trail crossings adjacent to or over jurisdictional features will occur outside of the jurisdictional limits of Corps, Regional Board, and CDFW. In particular, proposed trails will be installed over the drainage feature, outside of the top of bank. Additionally, an elevated trail will be installed within the temporarily disturbed portions of Hencks Meadow and Hooks Creek as part of the meadow rehabilitation project. Since the trail will be elevated, plants will be able to grow under the trail, and impacts to Hencks Meadow and Hooks Creek, as part of the meadow rehabilitation project, have been accounted for in the temporary impact analysis below.

6.1 U.S. ARMY CORPS OF ENGINEERS

Hooks Creek and Drainage 1 are tributary to Deep Creek (Relatively Permanent Water) and ultimately the Mojave River (Traditional Navigable Water). Whereas, Drainage 2 and 3 flow into City Creek which is tributary to the Santa Ana River (Relatively Permanent Water) and ultimately the Pacific Ocean (Traditional Navigable Water). As a result, Hooks Creek and Drainages 1-3 all qualify as waters of the United States and fall under the regulatory authority of the Corps. Approximately 1.49 acres (5,270 linear feet) of Corps jurisdiction (non-wetland waters) is located within the boundaries of the project site. Refer to Exhibit 8, *Corps Jurisdictional Areas*, for an illustration of Corps jurisdictional areas.

In agreement with between Skypark and the NRCS, the proposed project includes the rehabilitation of Henck's Meadow (restoration and improvement of the upstream portions of Hook Creek). Since there is an established agreement between Skypak and the NRCS, and the meadow rehabilitation is a planned NRCS activity, a Corps CWA Section 404 permit will not be required from the Corps for the meadow rehabilitation project.

6.2 REGIONAL WATER QUALITY CONTROL BOARD

Hooks Creek, including Hencks Meadow, and Drainages 1-3 exhibit characteristics consistent with the Regional Board's methodology and would be considered "waters of the State". Approximately 5.27 acres (5,270 linear feet) of Regional Board jurisdiction is located within boundaries of the project site. Refer to Exhibit 9, *Regional Board/CDFW Jurisdictional Area*, for an illustration of Regional Board jurisdictional areas.

Based on a review of design plans for the meadow rehabilitation project provided by the NRCS, approximately 0.82 acre of impacts will occur to Regional Baord jurisdictional areas as a result from the rehabilitation project. Of the 0.82 acre of impacts, 0.29 acre of permanent impacts will occur from the installation of riprap and the sediment basins, and 0.53 acre of temporary impacts will occur from construction activities. In addition, maintenance of the rehabilitated meadow will result in minor impacts to Regional Board jurisdictional areas from removal of sediment from the created basins. These impacts will be addressed during the Report of Waste Discharge permit process since a defined amount of impact cannot be calculated at this time. The other drainage features within the boundaries of the project site will not be impacted. Refer to Exhibit 10, *Jurisdictional Impacts*.

6.3 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Hooks Creek, including Hencks Meadow, and Drainages 1-3 exhibit characteristics consistent with CDFW's methodology and would be considered CDFW streambed. Approximately 5.27 acres (5,270 linear feet) of CDFW jurisdiction is located within boundaries of the project site. Refer to Exhibit 9, *Regional Board/CDFW Jurisdictional Area*, for an illustration of CDFW jurisdictional areas.

Based on a review of design plans for the meadow rehabilitation project provided by the NRCS, approximately 0.82 acre of impacts will occur to CDFW jurisdictional areas as a result from the rehabilitation project. Of the 0.82 acre of impacts, 0.29 acre of permanent impacts will occur from the installation of riprap and the sediment basins, and 0.53 acre of temporary impacts will occur from construction activities. In addition, maintenance of the rehabilitated meadow will result in minor impacts to CDFW jurisdictional areas from removal of sediment from the created basins. These impacts will be addressed during the 1602 permit process since a defined amount of impact cannot be calculated at this time. The other drainage features within the boundaries of the project site will not be impacted. Refer to Exhibit 10, *Jurisdictional Impacts*.

Hencks Meadow

Legend

- Project Site
- 5.27 AC — Regional Board Waters of the State CDFW Jurisdictional Streambed (Width/length in feet)
- Not Jurisdictional
- D-1 — Drainage Feature

Impacts

- 0.29 AC — Permanent
- 0.53 AC — Temporary

0 100 200 400 Feet

Source: San Bernardino County, Google Imagery, Esri Imagery

3/6/2017 JN M:\Mdata\144067\MXD\JD\10 Jurisdictional Impacts v2.mxd

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SKYPARK AT SANTA'S VILLAGE PROJECT
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS

Regional Board/CDFW Jurisdictional Impacts

Exhibit 10

Section 7 Regulatory Approval Process

The following is a summary of the various permits, certifications, and agreements that may be necessary prior to construction and/or alteration within jurisdictional areas.

7.1 UNTED STATES ARMY CORPS OF ENGINEERS

In agreement with between Skypark and the NRCS, NRCS has developed plans or a program to rehabilitate Henck's Meadow (restoration and improvement of the upstream portions of Hook Creek). Since the NRCS has planned and will manage the rehabilitation of the meadow, the Corps will not require a CWA Section 404 permit for this project.

7.2 NATURAL RESOURCES CONSERVATION SERVICE

Specific Nationwide Permits do not require a pre-construction notification to the Corps if one of the following two situations applies:

a) Activities conducted on non-Federal public lands and private lands, in accordance with the terms and conditions of a binding stream enhancement or restoration agreement or wetland enhancement, restoration, or establishment agreement between the landowner and the USFWS, NRCS, FSA, NMFS, NOS, USFS or their designated state cooperating agencies.

b) Voluntary stream or wetland restoration or enhancement action, or wetland establishment action, documented by the NRCS or USDA Technical Service Provider pursuant to NRCS Field Office Technical Guide standards.

Both of these conditions apply to this program developed by the NRCS. Therefore, since there is an established agreement between Skypak and the NRCS, and the meadow rehabilitation is a planned NRCS activity, a Corps CWA Section 404 permit will not be required.

7.3 REGIONAL WATER QUALITY CONTROL BOARD

The Regional Board regulates discharges to surface waters pursuant to Section 401 of the CWA and the California *Porter-Cologne Water Quality Control Act*. Since there is an established agreement between Skypak and the NRCS, and the meadow rehabilitation is a planned NRCS activity, a Corps CWA Section 404 permit will not be required from the Corps for the meadow rehabilitation project. As a result, a Corps CWA Section 404 permit will not be issued for the meadow rehabilitation project. Therefore, it will be necessary for Skypark to acquire a Report of Waste Discharge from the Regional Board for impacts occurring within Regional Board jurisdictional areas.

7.4 CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Pursuant to Section 1602 of the Fish and Game Code, CDFW regulates any activity that will divert or obstruct the natural flow or alter the bed, channel, or bank (which may include associated biological resources) of a river or stream. Therefore, it will be necessary for Skypark to acquire a Section 1602 Streambed Alteration Agreement for impacts occurring within CDFW jurisdictional areas.

7.5 RECOMMENDATIONS

It is recommended that this delineation be forwarded to the regulatory agencies listed in this report for their concurrence. The concurrence/receipt would be valid up to five years and would solidify findings noted within this report.

Section 8 References

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Appendix A Site Photographs

Photograph 1: Looking southwest at Hooks Creek on the central portion of the project site.

Photograph 2: Looking northeast at Hooks Creek on the central portion of the project site.

Photograph 3: View of stands of arroyo willow (*Salix lasiolepis*) associated with upstream portions of Hooks Creek.

Photograph 4: View of meadow adjacent to the headwaters of Hooks Creek on the southern portion of the project site.

Photograph 5: Looking northeast at existing detention basin on the northern portion of the project site.

Photograph 6: View of proposed parking lot location and disturbances associated with the on-site staging and processing of timber resources.

Photograph 7: View of proposed parking lot location and disturbances associated with the on-site staging and processing of timber resources.

Appendix B Methodology

WATERS OF THE UNITED STATES

Since 1972, the Corps and U.S. Environmental Protection Agency (EPA) have jointly regulated the filling of "waters of the U.S.", including wetlands, pursuant to Section 404 of the CWA. The Corps has regulatory authority over the discharge of dredged or fill material into the waters of the United States under Section 404 of the CWA. The Corps and EPA define "fill material" to include any "material placed in waters of the United States where the material has the effect of: (i) replacing any portion of a water of the United States with dry land; or (ii) changing the bottom elevation of any portion of the waters of the United States." Examples include, but are not limited to, sand, rock, clay, construction debris, wood chips, and "materials used to create any structure or infrastructure in the waters of the United States." The term "*waters of the United States*" is defined as follows:

(i) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide.

(ii) All interstate waters, including interstate wetlands[7].

(iii) The territorial seas.

(iv) All impoundments of waters otherwise defined as watres of the United States under the definition.

(v) All tributaries[8] of waters identified in paragraphs (i) through (iii) mentioned above.

(vi) All waters adjacent[9] to a water identified in paragraphs (i) through (v) mentioned above, including wetlands, ponds, lakes, oxbows, impoundments, and similar waters.

(vii) All prairie potholes, Carolina bays and Delmarva bays, Pocosins, western vernals pools, Texas coastal prairie wetlands, where they are determined, on a case-specific basis, to have a significant nexus to a water identified in paragraphs (i) through (iii) meantioned above.

(viii) All waters located within the 100-year floodplain of a water identified in paragraphs (i) through (iii) mentioned above and all waters located within 4,000 feet of the high tide line or ordinary high water mark of a water identified in paragraphs (i) through (v) mentioned above, where they are determined on a case-specific basis to have a

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7 The term *wetlands* means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

8 The terms *tributary* and *tributaries* each mean a water that contributes flow, either directly or through another water (including an impoundment identified in paragraph (iv) mentioned above), to a water identified in paragraphs (i) through (iii) mentioned above, that is characterized by the presence of the physical indicators of a bed and banks and an ordinary high water mark.

9 The term *adjacent* means bordering, contiguous, or neighboring a water identified in paragraphs (i) through (v) mentioned above, including waters separated by constructed dikes or barriers, natural river berms, beach dunes, and the like.

significant nexus to a waters identified in paragraphs (i) through (iii) mentioned above.

The following features are not defined as "waters of the United States" even when they meet the terms of paragraphs (iv) through (viii) mentioned above:

(i) Waste treatment systems, including treatment ponds or lagoons designed to meet the requriements of the Clean Water Act.

(ii) Prior converted cropland.

(iii) The following ditches:

  (A) Ditches with ephemeral flow that are not a relocated tributary or excavated in a tributary.

  (B) Ditches with intermittent flow that are not a relocated tributary, excavated in a tributary, or drain wetlands.

  (C) Ditches that do not flow, either directly or through another water, into a water of the United States as identified in paragraphs (i) through (iii) of the previous section.

(iv) The following features:

  (A) Artificially irrigated areas that would rever to dry land should application of water that area cease;

  (B) Artificial, constructed lakes and ponds created in dry land such as farm and stock watering ponds, irrigation ponds, settling basins, fields flooded for rice growing, log cleaning ponds, or cooling ponds;

  (C) Artificial reflecting pools or swimming pools created in dry land;

  (D) Small ornamental waters created in dry land;

  (E) Water-filled depressions created in dry land incidental to mining or construction activity, including pits excavated for obtaining fill, sand, or gravel that fill with water;

  (F) Erosional features, including gullies, rills, and other ephemeral features that do not meet the definition of a tributary, non-wetland swales, and lawfully constructed grassed waterways; and

  (G) Puddles.

(v) Groundwater, including groundwater drained through subsurface drainage systems.

(vi) Stormwater control features constructed to convey, treat, or store stormwater that are created in dry land.

(vii) Wastewater recycling structures constructed in dry land; detention and retention basins built for wastewater recycling; groundwater recharge basins; percolation ponds built for wastewater recycling; and water distributary structures built for wastewater recycling.

WETLANDS

For this project location, Corps jurisdictional wetlands are delineated using the methods outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0* (Corps, 2008). This document is one of a series of Regional Supplements to the Corps Wetland Delineation Manual (Corps 1987). The identification of wetlands is based on a three-parameter approach involving indicators of hydrophytic vegetation, hydric soil, and wetland hydrology. In order to be considered a wetland, an area must exhibit at least minimal characteristics within these three (3) parameters. The Regional Supplement presents wetland indicators, delineation guidance, and other information that is specific to the Arid West Region. In the field, vegetation, soils, and evidence of hydrology have been examined using the methodology listed below and documented on Corps' wetland data sheets, when applicable. It should be noted that both the Regional Board and the CDFW jurisdictional wetlands encompass those of the Corps.

Vegetation

Nearly 5,000 plant types in the United States may occur in wetlands. These plants, often referred to as hydrophytic vegetation, are listed in regional publications by the U.S. Fish and Wildlife Service (USFWS). In general, hydrophytic vegetation is present when the plant community is dominated by species that can tolerate prolonged inundation or soil saturation during growing season. Hydrophytic vegetation decisions are based on the assemblage of plant species growing on a site, rather than the presence or absence of particular indicator species. Vegetation strata are sampled separately when evaluating indicators of hydrophytic vegetation. A stratum for sampling purposes is defined as having 5 percent or more total plant cover. The following vegetation strata are recommended for use across the Arid West:

- *Tree Stratum:* Consists of woody plants 3 inches or more in diameter at breast height (DBH), regardless of height;
- *Sapling/shrub stratum:* Consists of woody plants less than 3 inches DBH, regardless of height;
- *Herb stratum:* Consists of all herbaceous (non-woody) plants, including herbaceous vines, regardless of size; and,
- *Woody vines:* Consists of all woody vines, regardless of size.

The following indicator is applied per the test method below.[10] Hydrophytic vegetation is present if any of the indicators are satisfied.

Indicator 1 – Dominance Test

Cover of vegetation is estimated and is ranked according to their dominance. Species that contribute to a cumulative total of 50% of the total dominant coverage, plus any species that comprise at least 20% (also known as the "50/20 rule") of the total dominant coverage, are recorded on a wetland data sheet. Wetland indicator status in California (Region 0) is assigned to each species using the *National Wetland Plant List, version 2.4.0* (Corps 2012). If greater than 50% of the dominant species from all strata were Obligate, Facultative-wetland, or Facultative species, the criteria for wetland vegetation is considered to be met. Plant indicator status categories are described below:

- *Obligate Wetland (OBL):* Plants that almost always occur in wetlands;
- *Facultative Wetland (FACW):* Plants that usually occur in wetlands, but may occur in non-wetlands;
- *Facultative (FAC):* Plants that occur in wetlands and non-wetlands;
- *Facultative Upland (FACU):* Plants that usually occur in non-wetlands, but may occur in wetlands; and,
- *Obligate Upland (UPL):* Plants that almost never occur in wetlands.

Hydrology

Wetland hydrology indicators are presented in four (4) groups, which include:

Group A – Observation of Surface Water or Saturated Soils

Group A is based on the direct observation of surface water or groundwater during the site visit.

Group B – Evidence of Recent Inundation

[10] Although the Dominance Test is utilized in the majority of wetland delineations, other indicator tests may be employed. If one indicator of hydric soil and one primary or two secondary indicators of wetland hydrology are present, then the Prevalence Test (Indicator 2) may be performed. If the plant community satisfies the Prevalence Test, then the vegetation is hydric. If the Prevalence Test fails, then the Morphological Adaptation Test may be performed, where the delineator analyzes the vegetation for potential morphological features.

Group B consists of evidence that the site is subject to flooding or ponding, although it may not be inundated currently. These indicators include water marks, drift deposits, sediment deposits, and similar features.

Group C – Evidence of Recent Soil Saturation

Group C consists of indirect evidence that the soil was saturated recently. Some of these indicators, such as oxidized rhizopheres surrounding living roots and the presence of reduced iron or sulfur in the soil profile, indicate that the soil has been saturated for an extended period.

Group D – Evidence from Other Site Conditions or Data

Group D consists of vegetation and soil features that indicate contemporary rather than historical wet conditions, and include shallow aquitard and the FAC-neutral test.

If wetland vegetation criteria is met, the presence of wetland hydrology is evaluated at each transect by recording the extent of observed surface flows, depth of inundation, depth to saturated soils, and depth to free water in the soil test pits. The lateral extent of the hydrology indicators are used as a guide for locating soil pits for evaluation of hydric soils and jurisdictional areas. In portions of the stream where the flow is divided by multiple channels with intermediate sand bars, the entire area between the channels is considered within the OHWM and the wetland hydrology indicator is considered met for the entire area.

Soils

A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper 16-20 inches.[11] The concept of hydric soils includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation. Soils that are sufficiently wet because of artificial measures are included in the concept of hydric soils. It should also be noted that the limits of wetland hydrology indicators are used as a guide for locating soil pits. If any hydric soil features are located, progressive pits are dug moving laterally away from the active channel until hydric features are no longer present within the top 20 inches of the soil profile.

Once in the field, soil characteristics are verified by digging soil pits along each transect to an excavation depth of 20 inches; in areas of high sediment deposition, soil pit depth may be increased. Soil pit locations are usually placed within the drainage invert or within adjoining vegetation. At each soil pit, the soil texture and color are recorded by comparison with standard

[11] According to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region, Version 2.0 (Corps 2008), growing season dates are determined through on-site observations of the following indicators of biological activity in a given year: (1) above-ground growth and development of vascular plants, and/or (2) soil temperature.

plates within a *Munsell Soil Chart* (2009). Munsell Soil Charts aid in designating color labels to soils, based by degrees of three simple variables – hue, value, and chroma. Any indicators of hydric soils, such as organic accumulation, iron reduction, translocation, and accumulation, and sulfate reduction, are also recorded.

Hydric soil indicators are present in three groups, which include:

All Soils

"All soils" refers to soils with any United States Department of Agriculture (USDA) soil texture. Hydric soil indicators within this group include histosol, histic epipedon, black histic, hydrogen sulfide, stratified layers, 1 cm muck, depleted below dark surface, and thick dark surface.

Sandy Soils

"Sandy soils" refers to soil materials with a USDA soil texture of loamy fine sand and coarser. Hydric soil indicators within this group include sandy mucky mineral, sandy gleyed matrix, sandy redox, and stripped matrix.

Loamy and Clayey Soils

"Loamy and clayey soils" refers to soil materials with a USDA soil texture of loamy very fine sand and finer. Hydric soil indicators within this group include loamy mucky mineral, loamy gleyed matrix, depleted matrix, redox dark surface, depleted dark surface, redox depressions, and vernal pools.

SWANCC WATERS

The term "isolated waters" is generally applied to waters/wetlands that are not connected by surface water to a river, lake, ocean, or other body of water. In the presence of isolated conditions, the Regional Board and CDFW take jurisdiction through the application of the OHWM/streambed and/or the 3 parameter wetland methodology utilized by the Corps.

RAPANOS WATERS

The Corps will assert jurisdiction over non-navigable, not relatively permanent tributaries and their adjacent wetlands where such tributaries and wetlands have a significant nexus to a TNW. The flow characteristics and functions of the tributary itself, in combination with the functions performed by any wetlands adjacent to the tributary, determine if these waters/wetlands significantly affect the chemical, physical, and biological integrity of the TNWs. Factors considered in the significant nexus evaluation include:

(1) The consideration of hydrologic factors including, but not limited to, the following:

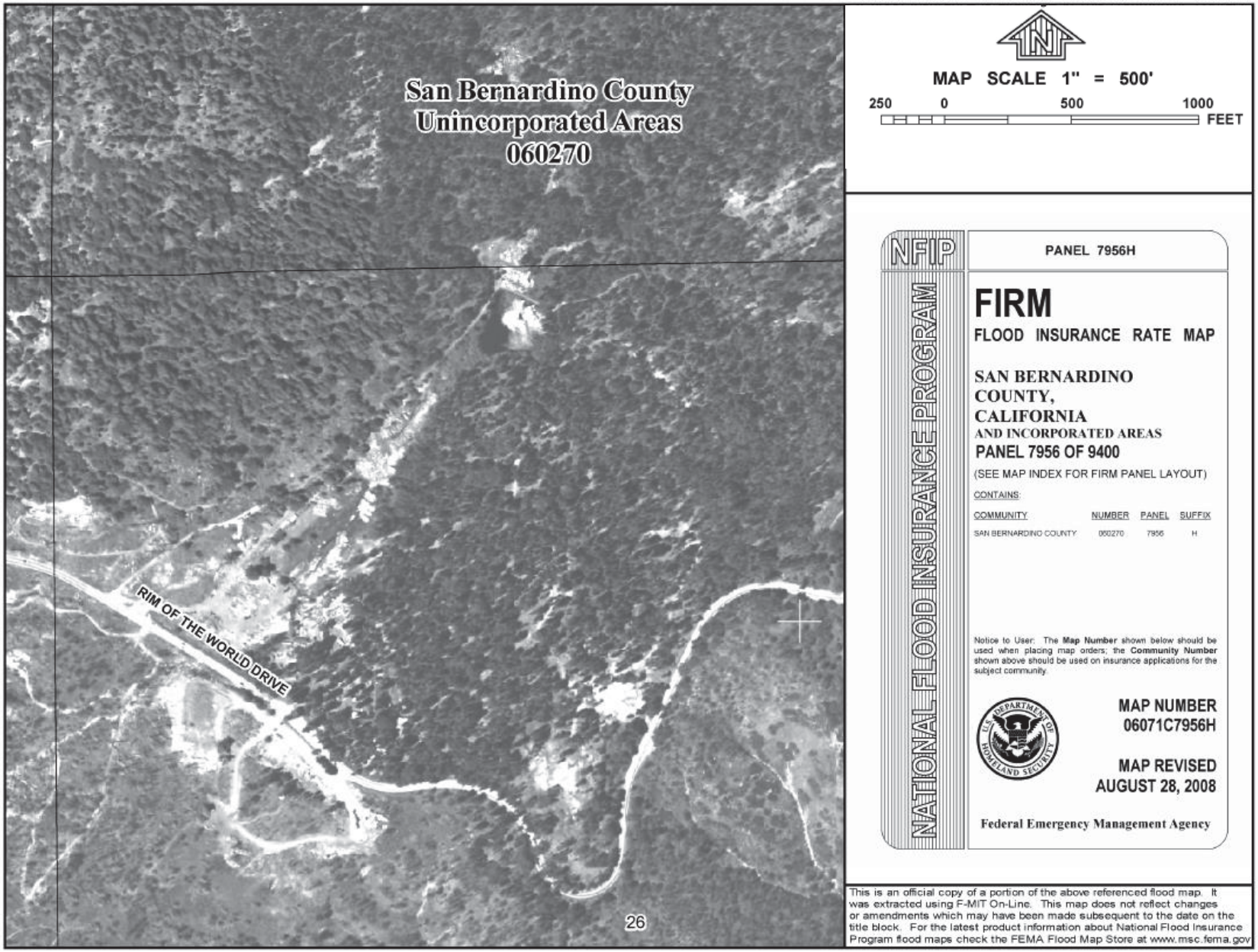
- volume, duration, and frequency of flow, including consideration of certain physical characteristics of the tributary
- proximity to the TNW
- size of the watershed average annual rainfall
- average annual winter snow pack

(2) The consideration of ecologic factors including, but not limited to, the following:

- the ability for tributaries to carry pollutants and flood waters to TNWs
- the ability of a tributary to provide aquatic habitat that supports a TNW
- the ability of wetlands to trap and filter pollutants or store flood waters
- maintenance of water quality

Appendix C Documentation


U.S. Fish and Wildlife Service
National Wetlands Inventory
SKYPARK AT SANTA'S VILLAGE PROJECT
Wetlands
Freshwater Emergent
Freshwater Forested/Shrub
Estuarine and Marine Deepwater
Estuarine and Marine
Freshwater Pond
Lake
Riverine
Other
Skyforest
San Bernardino National Forest
500 m
2000 ft
POWERED BY esri
This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.


San Bernardino County
Unincorporated Areas
060270
RIM OF THE WORLD DRIVE
26
MAP SCALE 1" = 500'
250 0 500 1000
FEET
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 7956H
FIRM
FLOOD INSURANCE RATE MAP
SAN BERNARDINO COUNTY, CALIFORNIA
AND INCORPORATED AREAS
PANEL 7956 OF 9400
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
SAN BERNARDINO COUNTY 060270 7956 H
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
06071C7956H
MAP REVISED
AUGUST 28, 2008
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Appendix D Soil Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Skypark at Santa's Village City/County: Skyforest / San Bernardino Sampling Date: 11/20/2014

Applicant/Owner: Skypark at Santa's Village State: CA Sampling Point: SP-1

Investigator(s): Travis J. McGill, Thomas C. Millington Section, Township, Range: Section 26, Township 2 North, Range 3 West

Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Flat Slope (%): 0 - 5%

Subregion (LRR): C - Mediterranean Lat: 34.233643 Long: -117.169468 Datum: NAD 83

Soil Map Unit Name: (MbF) Morical-Wind River Families Complex, 30 to 50 Percent Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Slender leaved sedge (Carex athrostachya)	50	Yes	FACW
2. Pacific rush (Juncus effusus ssp. pacificus)	10	No	FACW
3. Stinging nettle (Urtica dioica)	2	No	FAC
4.			
5.			
6.			
7.			
8.			
	62 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 38 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species 60	x 2 =	120
FAC species 2	x 3 =	6
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: 62 (A)		126 (B)

Prevalence Index = B/A = 2.03

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP-1

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 18 "	10 YR 2 / 1	100	-	-	-	-	Silty Clay	Loam
18 " =	Bottom of pit							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Not applicable

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

Soil sample comprised entirely of one layer with no visible redoximorphic features or hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ✓ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): 4 inches

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water present adjacent to soil point. Saturation present within sample.

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Skypark at Santa's Village City/County: Skyforest / San Bernardino Sampling Date: 11/20/2014

Applicant/Owner: Skypark at Santa's Village State: CA Sampling Point: SP-2

Investigator(s): Travis J. McGill, Thomas C. Millington Section, Township, Range: Section 26, Township 2 North, Range 3 West

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1 - 2%

Subregion (LRR): C - Mediterranean Lat: 34.233730 Long: -117.169128 Datum: NAD 83

Soil Map Unit Name: (MbF) Morical-Wind River Families Complex, 30 to 50 Percent Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Arroyo willow (Salix lasiolepis)	25	Yes	FACW
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Slender leaved sedge (Carex athrostachya)	50	Yes	FACW
2. Broadleaved cattail (Typha latifolia)	20	Yes	OBL
3. Everlasting (Pseudognaphalium beneolens)	20	Yes	FACU
4. Pacific rush (Juncus effusus ssp. pacificus)	10	No	FACW
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
FACW species	85	x 2 =	170
FAC species		x 3 =	
FACU species	20	x 4 =	80
UPL species		x 5 =	
Column Totals:	125 (A)		270 (B)

Prevalence Index = B/A = 2.16

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP-2

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 20 "	10 YR 2 / 2	100	-	-	-	-	Loamy	Sand
20 " =	Bottom of pit							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Not applicable

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

Soil sample comprised entirely of one layer with no visible redoximorphic features or hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Skypark at Santa's Village City/County: Skyforest / San Bernardino Sampling Date: 11/20/2014

Applicant/Owner: Skypark at Santa's Village State: CA Sampling Point: SP-3

Investigator(s): Travis J. McGill, Thomas C. Millington Section, Township, Range: Section 26, Township 2 North, Range 3 West

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1 - 2%

Subregion (LRR): C - Mediterranean Lat: 34.233946 Long: -117.168881 Datum: NAD 83

Soil Map Unit Name: (MbF) Morical-Wind River Families Complex, 30 to 50 Percent Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Broadleaved cattail (Typha latifolia)	100	Yes	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 100	x 1 =	100
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: 100 (A)		100 (B)

Prevalence Index = B/A = 1

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP-3

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 -18 "	10 YR 2 / 2	100	-	-	-	-	Loamy	Sand
18 " =	Bottom of pit							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Not applicable

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

Soil sample comprised entirely of one layer with no visible redoximorphic features or hydric soil indicators.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No ✓ Depth (inches): ___

Wetland Hydrology Present? Yes ___ No ✓

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Skypark at Santa's Village City/County: Skyforest / San Bernardino Sampling Date: 11/20/2014

Applicant/Owner: Skypark at Santa's Village State: CA Sampling Point: SP-4

Investigator(s): Travis J. McGill, Thomas C. Millington Section, Township, Range: Section 26, Township 2 North, Range 3 West

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1 - 2%

Subregion (LRR): C - Mediterranean Lat: 34.236008 Long: -117.166993 Datum: NAD 83

Soil Map Unit Name: (MbF) Morical-Wind River Families Complex, 30 to 50 Percent Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Northern water plantain (Alisma triviale)	90	Yes	FACW
2. Water cress (Nasturtium officinale)	2	No	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 8 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 2	x 1 = 2
FACW species 90	x 2 = 180
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 92 (A)	182 (B)

Prevalence Index = B/A = 1.98

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP-4

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0 - 2 "	10 YR 2 / 1	100	-	-	-	-	Silty Clay	Loam
2 - 4 "	7.5 YR 2.5 / 2	100	-	-	-	-	Sand	
4 - 18"	10 YR 2/1	100	-	-	-	-	Silty Clay	Loam
18 " =	Bottom of pit							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Not applicable

Depth (inches): ___

Hydric Soil Present? Yes ✓ **No** ___

Remarks:

Hydric soils found on the fringe of the existing pond. Water levels fluctuate within the pond and this area is frequently under water.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ✓ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ✓ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ✓ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ✓ No ___ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Skypark at Santa's Village City/County: Skyforest / San Bernardino Sampling Date: 11/20/2014

Applicant/Owner: Skypark at Santa's Village State: CA Sampling Point: SP-5

Investigator(s): Travis J. McGill, Thomas C. Millington Section, Township, Range: Section 26, Township 2 North, Range 3 West

Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): None Slope (%): 1 - 2%

Subregion (LRR): C - Mediterranean Lat: 34.235948 Long: -117.166947 Datum: NAD 83

Soil Map Unit Name: (MbF) Morical-Wind River Families Complex, 30 to 50 Percent Slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ✓ No _____ (If no, explain in Remarks.)

Are Vegetation ✓, Soil ✓, or Hydrology ✓ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No _____

Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Watercress (Nasturtium officinale)	25	Yes	OBL
2. Northern water plantain (Alisma triviale)	25	Yes	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	50 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 50 % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 25	x 1 = 25
FACW species 25	x 2 = 50
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: 50 (A)	75 (B)

Prevalence Index = B/A = 1.5

Hydrophytic Vegetation Indicators:

✓ Dominance Test is >50%

✓ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No _____

Remarks:

SOIL

Sampling Point: SP-5

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0 - 18 "	10 YR 2 / 1	100	-	-	-	-	Silty Clay	Loam
18 " =	Bottom of pit							

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: Not applicable

Depth (inches): ___

Hydric Soil Present? Yes ___ No ✓

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ✓ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
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- ___ Oxidized Rhizospheres along Living Roots (C3)
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- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
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- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No ✓ Depth (inches): ___

Water Table Present? Yes ___ No ✓ Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ✓ No ___ Depth (inches): ___

Wetland Hydrology Present? Yes ✓ No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix J: Existing Septic System Details

RWM & ASSOCIATES, LLC
Civil Engineering, Land Surveying and Building Design

P.O. Box 520, Twin Peaks, CA 92391
(909) 337-3058

Kevin White, Senior Planner
County of San Bernardino
Land Use Services Department – Planning Division
385 North Arrowhead, First Floor
San Bernardino, Ca. 92415-0187
Email: Kwhite@lus.sbcounty.gov

9-Aug-16

Attn: Lahontan Regional Water Board

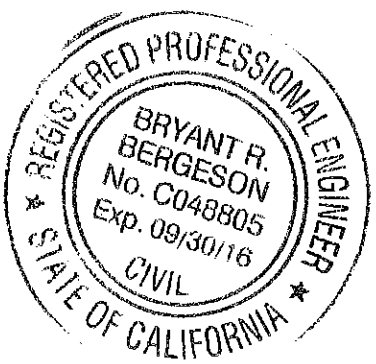
This is in part a response to the draft review dated July 21, 2016 Re: Environmental doc review, San Bernardino County – Sky Park at Santa's Village Clearinghouse #201509100. These comments are germane only to the Lahontan Regional Boards comments.

The existing septic systems based on my review and design analysis has no added impact to the existing quality of ground water see attached maps and reports in regards to the existing septic system, it also shows the components of the existing septic system. The project does not have any new systems proposed inside this boards region of the project. The map also shows location and elevations and distances in regards to the closet functioning well. The minimum 5' separation is met with no problem. The systems have been maintained and upgraded over the years and are great running condition today and future upgrades and maintenance will be through proper permitting through the county.

In regards to existing systems installed, it was all in place prior to May 15, 1975 and over the years it has had septic certs done and the systems have undergone minor upgrades nothing to significant, but if this occurs we will file the changes through environmental health. Also in regards to this project affecting the deep creek water shed it is my professional opinion that there is no significant impact at this present time with the proposed project as designed. Please review the map and reports if there is any questions please let me know.

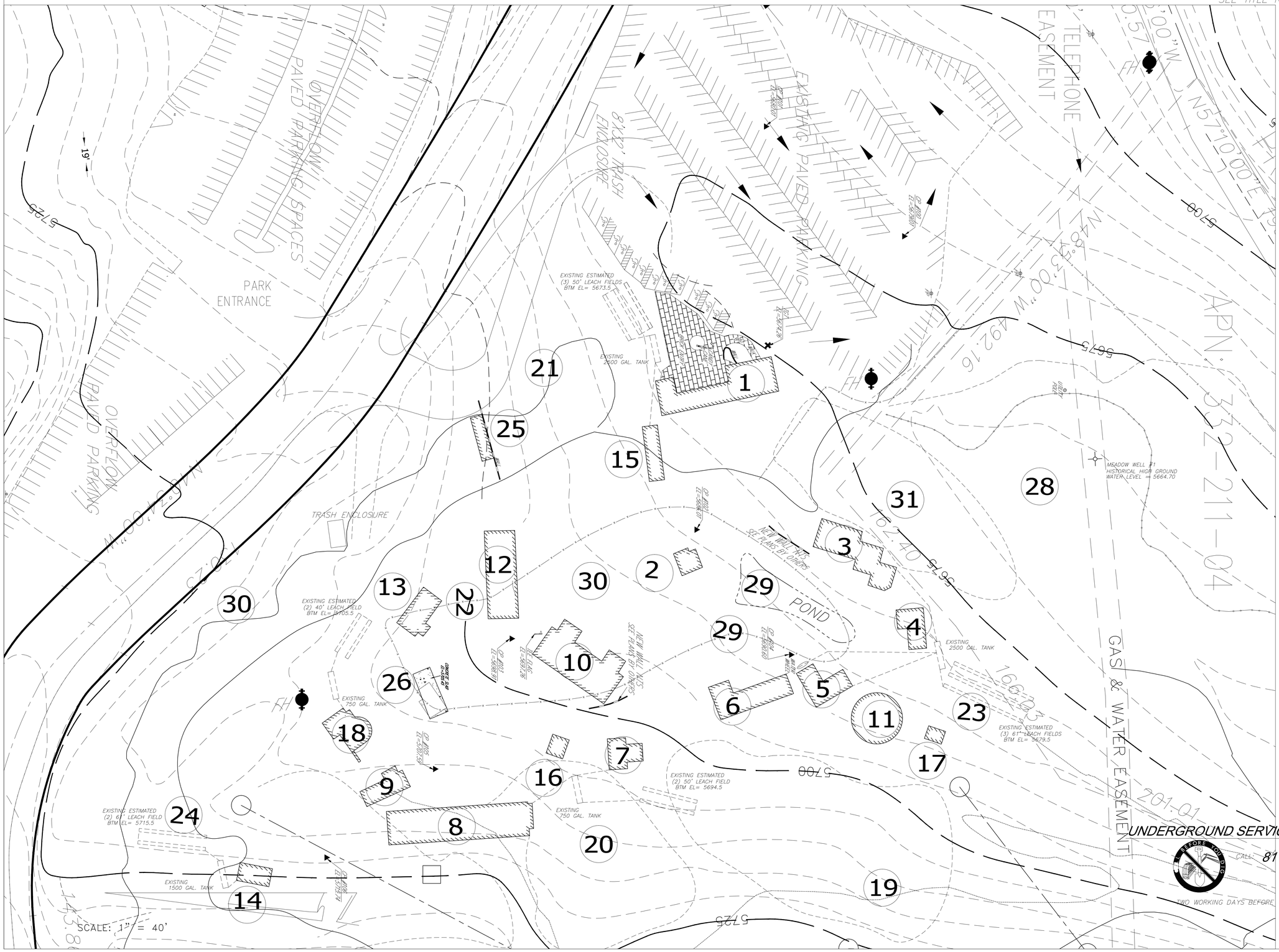
Sincerely,

Bryant Bergeson, P.E.



EXISTING PERC SYTEM LAYOUT MAP

SEE TITLE REPORT APN# 332-211-02



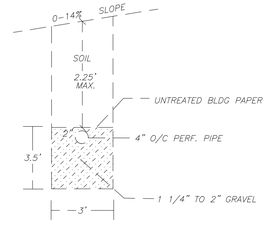
SCALE: 1" = 40'

ENGINEER'S NOTICE TO CONTRACTOR

THE EXISTING AND LOCATION OF ANY UNDERGROUND UTILITY PIPES, CONDUITS OR STRUCTURES SHOWN ON THESE PLANS ARE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE ON THESE PLANS. THE REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN ON THESE DRAWINGS. THE CONTRACTOR FURTHER ASSUMES ALL LIABILITY AND RESPONSIBILITY FOR THE UTILITY PIPES, CONDUITS OR STRUCTURES SHOWN OR NOT SHOWN ON THESE DRAWINGS.

CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOBSITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT INCLUDING THE SAFTEY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO REGULAR WORKING HOURS AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE COUNTY, THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY , REAL OR ALLEDGED, IN CONECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING OF LIABILITY ARISING FROM SOLE NEGLIGENCE OF THE COUNTY, THE OWNER OR THE ENGINEER.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN EVENT OF DISCREPANCIES ARISING AFTER CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY/COUNTY.



LEACH LINE CROSS SECTION

NOTES:

1. ⊙ = TEST HOLE LOCATION
2. — — = EXISTING CONTOURS (APPROX.)
4. SEE CORNER RECORD SURVEY FOR SURVEY DATA.
5. WORK TO BE DONE IN ACCORDANCE W/ CURRENT U.P.C.
6. OWNER TO VERIFY SEPERATION AND SET BACK LINES.
7. ANY LARGE ROCK FOUND IN AREA OF SYSTEM TO BE REMOVED.

UNDERGROUND SERVICE ALERT

CALL 811

TWO WORKING DAYS BEFORE YOU DIG!

PERC LAYOUT PLAN

SKY PARK / SANTAS VILLAGE
P.O. BOX 420
LAKE ARROWHEAD CA. 92352
28950 STATE HWY #18
SKY FOREST CA. 92385
SEE TITLE REPORT APN# 332-211-02

RWM & ASSOCIATES, LLC.
CIVIL ENGINEERING – LAND SURVEYING
ARCHITECTURAL DESIGN
26748 HWY# 189, TWIN PEAKS CA. 92391
P.O.B. 520,
TWIN PEAKS, CA., 92391
(909) 337-3058
RWMCDONALDII@GMAIL..COM

ENGINEER	
DESIGNER	DRAFTSMAN
LAND SURVEYOR	
	SHEET 1

RWM & ASSOCIATES, LLC
Civil Engineering, Land Surveying and Building Design

P.O. Box 520, Twin Peaks, CA 92391
(909) 337-3058

San Bernardino County
Environmental Improvement Agency
Environmental Health Services
385 N. Arrowhead Avenue
San Bernardino, CA 92415

January 12, 2014

Attn: REHS
Re: Existing System Design
Sky Park - Santa's Village
APN: 340-271-06 BUILDING #1 & #15
28950 Hwy # 18, Sky Forest Ca.

Dear Sirs,

The following is the summary of the percolation test and the resulting design for the existing private sewage system for the subject property, followed by a field certification by C-42 license.

1. **Description of Site and Proposal:**
   - **1.1** Prepared for: Sky Park / Santa's Village
     C/O RWM & ASSOCITES, LLC.
   - **1.2** Location of Land: See attached Map.
   - **1.3** Proposed Development:
     a. Proposed Development: bathroom facility
     b. See Attached Map
     c. An existing 2500 gallon septic Tank and leach lines.
     d. See attached map.
   - **1.4** a. Topography / site plan: See attached map.
     b. Drainage from site is sheet flow to the north.
     c. Vegetation: Dry grasses and brush with Pine and Oak Trees.
     d. There are several existing structures on the site. There is existing structures on the adjacent parcel to the north. There is existing 20,000 water tank on site
     e. There are no known wells within 100' of the proposed system. There are no streams within 50' of the proposed system. Historical well/ground water is 5.3' from well top of ground, therefore total separation between bottom of leech field and historical high ground water is 8.8' and leech field distance to well head is 414' to the northeast.
     f. See attached drawings.
     g. No ground water was encountered in any excavation.
     h. No other features, which would affect the system, were observed at the site.
     i. Leach lines and expansion areas will be located on natural ground as shown on the attached system layout.

2. Equipment:

2.1 Backhoe with a 24" bucket, manual posthole digger and tape measure.

3. Methodology and Procedures

3.1 Location of Borings: Random, See attached map.

3.2 Four holes were dug to a depth of six feet below original ground and one exploratory hole was dug to a depth of thirteen feet below original ground. The soils data developed as a result of the exploratory and test holes should be representative of the area where the system is to be constructed. However, additional data developed during system construction could result in relocation of the system or necessitate the use of a holding tank in lieu of the septic system. Any large rock encountered in the system area will be removed as necessary for construction.

3.3 Test holes were prepared and tests were performed in accordance with the simplified standard test procedures. See attached test sheet. Six-inch diameter holes were used.

4. Results:

4.1 Hole locations are shown on the attached map.
Hole #1 through #4
0 - 3' dark Brown Top Soil
3 – 6' dark Brown Soil with Light Tan D.G. intermixed.
Hole #5
0 - 3' dark Brown Top Soil
3' – 6' dark Brown Top with Light Tan D.G. intermixed.
6' – 13' dark Brown Soil with Light Tan D.G. intermixed
No unusual moisture was encountered in any excavation.

4.2.1 Design rate = 11.89 minutes per inch. Referring to the DEHS chart, 1.2 square foot per gallon was used. Therefore, 1.2(900)/7 x 1.0 = 155 lineal feet of leach line using 3' X 3' gravel.

5. Discussion of Results:

5.1 Tests were fairly uniform, ranging from 6.35 to 10.88 with a design rate of 11.89 minutes per inch.

5.2 NA

6. Design:

6.1 Based on the above, the rate of 11.89 minutes per inch was used. See section 4.2.1.

6.2 See section 4.2.1 and the attached map

7. Plot: See attached Map.

8. Calculations

GENERAL BUILDING

Facilities	Quantity	"Units"	Total Units
Urinals	2	2	4
Water Closet	2	6	12
Wash Basin	4	2	8
			24

Summary

General building Per UPC, Table I-2, 51 Units = 1200

Flow: 1200/ .75 = (900)

Volume = 900

9. General Discussion:

9.1 By topography map the slope in area of leach lines is measured at approx. >10 %.

9.2 Based on all of the above data, it is my professional opinion that existing system with the certifications is and has sufficient area to handle the liquid wastes without creating a nuisance or contaminating the ground water and the system will meet the requirements of the Lahaton Regional Water Quality Control Board.

If you have any questions concerning this design review, please call.

Sincerely,

Bryant Bergeson, P.E.

PERCOLATION TEST SHEET A
PARCEL 1

Project:SKYPARK Job No.SEE TITLE REPORT

APN #332-211-02 Date:12/2014

By: R2-R3

Hole No.: *1 - 4* Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Soil Type: *See Report*

Hole No.	Time 1	H1 (Inches)	Time 2	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:00:00	*8"*	*1:08:14*	*7"*	8:14	*1"*	8.23
No. 2	1:01:36	*8"*	*1:12:28*	*7"*	10:52	*1"*	10.87
No. 3	1:02:28	*8"*	*1:07:05*	*7"*	4:37	*1"*	4.61
No. 4	1:04:06	*8"*	*1:07:55*	*7"*	3:49	*1"*	3.82
No. 1	1:08:15	*8"*	*1:12:30*	*7"*	4:15	*1"*	4.25
No. 2	1:13:28	*8"*	*1:21:57*	*7"*	8:37	*1"*	8.62
No. 3	1:07:17	*8"*	*1:22:13*	*7"*	14:56	*1"*	14.93
No. 4	1:08:30	*8"*	*1:12:22*	*7"*	3:52	*1"*	3.87

PERCOLATION TEST SHEET B
PARCEL 1

Project: SAME AS ABOVE _____ Job No. _____

_____ Date: _____

_____ By: _____

_____ Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Hole No.: *1 - 4*

Soil Type: *See Report*

Hole No.	Time 3	H1 (Inches)	Time 4	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:12:32	*8"*	*1:18:50*	*7"*	6:21	*1"*	6.35
No. 2	1:21:57	*8"*	*1:32:50*	*7"*	10:53	*1"*	10.88
No. 3	1:22:15	*8"*	*1:31:37*	*7"*	9:22	*1"*	9.37
No. 4	1:12:22	*8"*	*1:19:30*	*7"*	7:07	*1"*	7.13
No. 1	1:19:45	*8"*	*1:28:10*	*7'*	8:25	*1"*	8.42
No. 2	1:32:59	*8"*	*1:42:33*	*7"*	9:34	*1"*	9.57
No. 3	1:32:20	*8"*	*1:42:35*	*7"*	3:36	*1"*	10.25
No. 4	1:19:55	*8"*	*1:28:47*	*7"*	8:52	*1"*	8.87

Percolation Rate: 8.85 min./inch

(avg. + high) / 2 = 8.85 + 14.93 / 2 = 11.89

Adjusted Percolation Rate: 11.89 min./ inch

Pacific Surveys

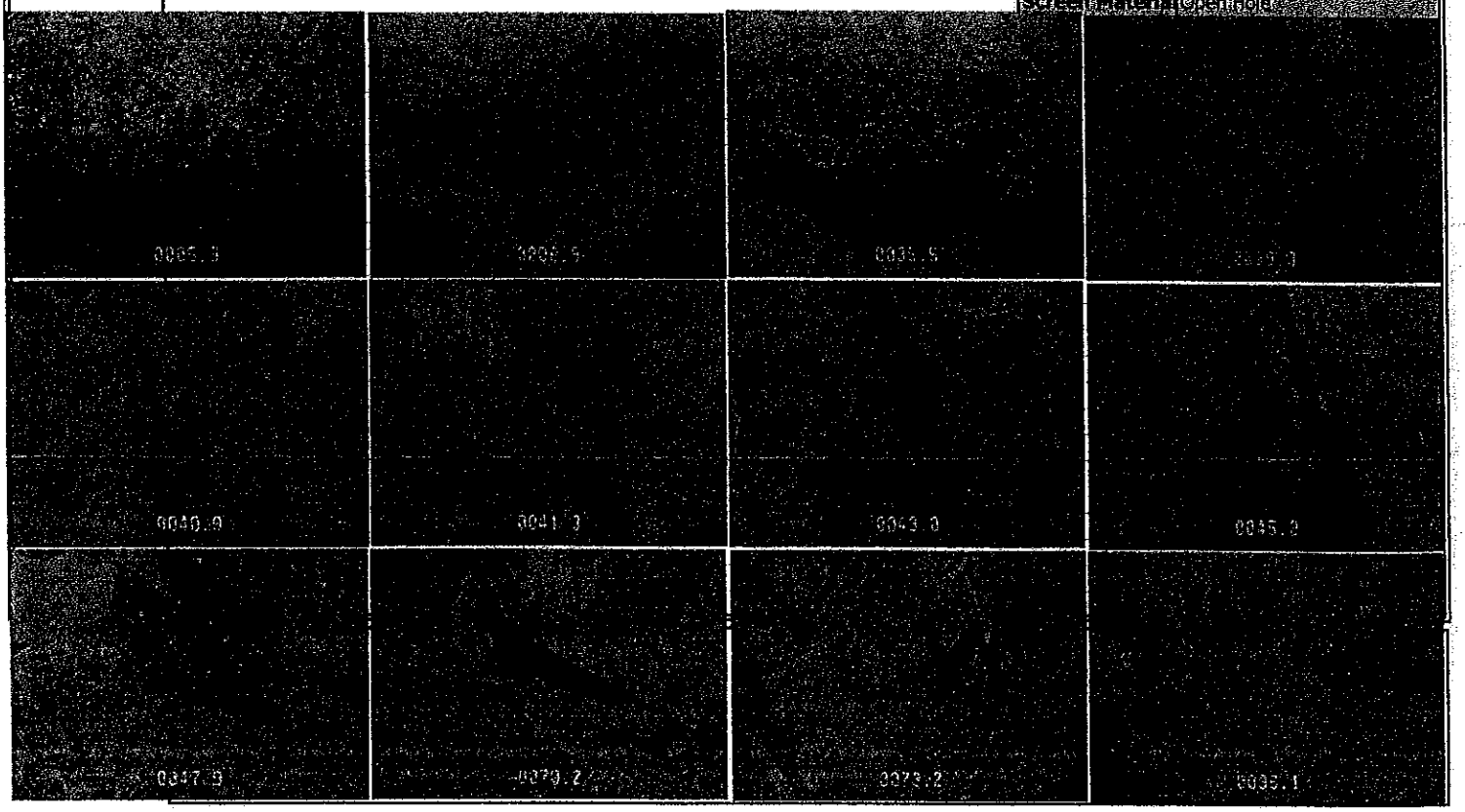
a full service geophysical well logging company

Video Survey Report

Company:	Harich Enterprises	**Date:**	04-Aug-14		
Well:	Meadow well 1	**Run No.**	One	**Truck**	PS-6
Field:	Skyforest	**Job Ticket:**	18613		
State:	California	**Total Depth:**	96 ft		
		Water Level:	5 ft	SWL	
Location:	Santa's Village	**Oil on Water:**	No	**Amount:**	0 ft
	GPS N34o14.023' W117o10.163'	**Operator:**	Nelson		
Zero Datum:	Top of CSG	**Tool Zero:**	Side-Scan	**Dead Space**	2.00 ft
Reason for Survey:	General Inspection	**Guides Set @**	7.00 in		

Depth	Observations
0.0 ft	Start survey at top of survey.
5.3 ft	SWL; water cloudy, visibility poor.
8.9 ft	Heavy scale on casing.
35.5 ft	End of casing open hole.
39.3 ft	Fractured zone.
40.9 ft	Fractured zone with possible water production zone.
43.0 ft	Fractured zone with possible water production zone.
45.0 ft	Large fractured with possible water production zone.
47.9 ft	Break out fractured zone.
70.2 ft	Fractured zone.
73.2 ft	Large break out.
96.1 ft	Fill; end survey.

Perforation:	**From Survey**
Open Hole	N/A
Casing Size:	**From Survey**
8.00 in	0.00 ft to 35.50ft
Open Hole	35.50 ft to 96.10ft
CSG Material:	PVC
Screen Material:	Open Hole



800.919.7555
909.625.6262

4456 via st. ambrose
claremont ca 91711
www.pacificsurveys.com

fax: 909.399.3180

BUILDING # 1 # 15

County of San Bernardino • Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES

www.sbcounty.gov/dehs

PRIVATE SEWAGE DISPOSAL SYSTEM CERTIFICATION

Applicant shall complete top 3 lines only. Certification shall be completed, on both sides, by a licensed contractor (A ,B, or C-42) or other qualified professional (R.P.E., C.E.G., R.E.H.S., etc.) Use n/a where necessary. For information, please call 909-387-4666.

Property Owner: SKY PARK, SANTA'S VILLAGE	Applicant Name:
Property Address: 28950 HWY 18	APN: 0332-211-02, 0332-212-02
Type of Project (Specify) TR, PM, CUP, DR, LUR, etc:	File Index Number:

Number of Units	Garbage Disposal Y ☐ N ☒	Tank Last Pumped (mo. / yr.) 6/14
Bedrooms 0	Vacant Y ☒ N ☐ How Long (yrs.) N/A	Tank Age (yrs.) N/A
Bathrooms 0	Basement Y ☐ N ☒	Disposal Area Age (yrs.) N/A

Commercial Development	Type of Fixtures (per UPC) *Indicate type and number of each* ENTER BUILDING	
	Total Number of Fixture Units ☒ 24	Grease Interceptor ☐ Clarifier ☐ None ☒

Type of Septic Tank (Specify) CEMENT		Dimensions (L x W x D) (ft.) 25'x5'x5'
Type of Cover (Specify) DIRT	Tank Capacity (Gallons) 2500	No. of Compartments 2
Specify Any Damage or Defects Observed: NONE		

Type of Disposal Area Seepage Pit ☐ Leachlines ☒ Other ☐ (Specify)		
Distance From Well N/A ft.	Distance from Foundation N/A ft.	Distance from Nearest Lot Line ☐ Front ☐ Side ☐ Rear
Specify Any Damage or Defects Observed:		

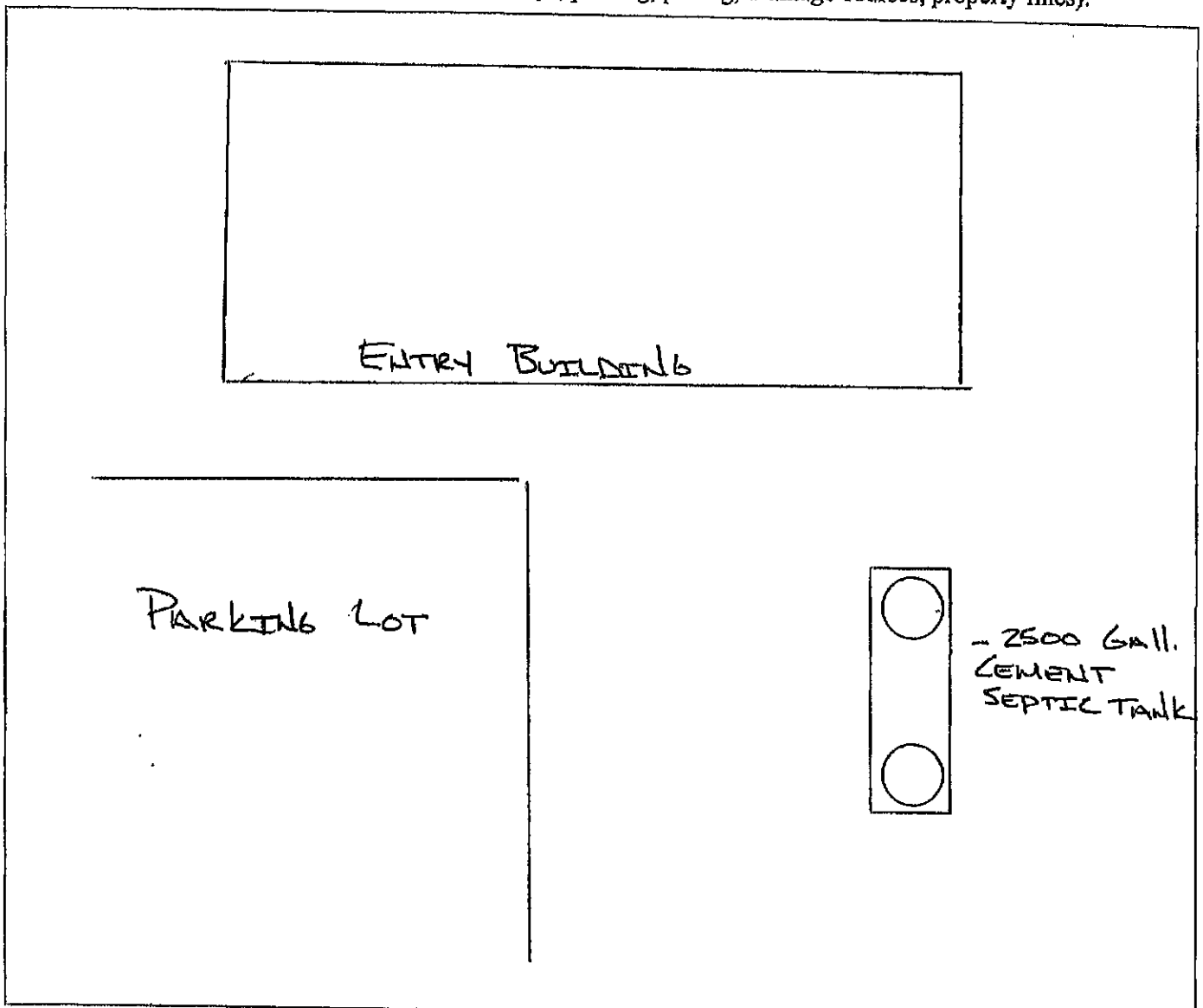
Seepage Pits	Number of Pits	Outside Diameter (ft.)	Depth (ft.)
	Depth of Pit Below Inlet (ft.)	Lining Material (Specify)	

Leachlines N/A	Number of Lines	Trench Width (in.)	Average Length of Lines (ft.)
	Total Absorption Area (sq. ft.) *Bottom of Trenches*		Depth (in.) *Finish Grade to Top of Line*
	Distance Between Lines (ft.)		Type of Filter Material Beneath Line (in.)
	Depth of Material Above Line (in.)		Depth of Material Beneath Line (in.)

Specify Indications of Previous System Failures (Odors, Seepage, etc.): *Use Additional paper if necessary*		
Dye Test Y ☐ N ☒	Hydraulic Test Y ☒ N ☐	NOTE: Attach test results and copies of building permits.

Tank & Disposal Area Information

In the space provided, show the location of the septic tank and disposal area in relation to the buildings and other landmarks (i.e. wells, trees, shrubs, driveways, parking, paving, drainage courses, property lines).



It is the opinion of the certifier that this sewage disposal system, ☐ Meets current code, ☒ Can be expected to function satisfactorily and is not likely to create any unsanitary conditions. OR ☐ Cannot be expected to function satisfactorily.

Date:	Signature:	Type of License:	Reg. Number:	Expiration:
7-24-14		C-42	363126	7/16

Name of Certifier:	Address:
SEAN BENNETT	P.O Box 1520, 92325

For DEHS Use Only

Reviewed By:	Date:
☐ Approved	☐ Not Approved - Reason

RWM & ASSOCIATES, LLC
Civil Engineering, Land Surveying and Building Design

P.O. Box 520, Twin Peaks, CA 92391
(909) 337-3058

San Bernardino County
Environmental Improvement Agency
Environmental Health Services
385 N. Arrowhead Avenue
San Bernardino, CA 92415

January 12, 2014

Attn: REHS
Re: Existing System Design
Sky Park - Santa's Village
APN: 340-271-06 BUILDING #3, #4, #5 & #6
28950 Hwy # 18, Sky Forest Ca.
Dear Sirs,

The following is the summary of the percolation test and the resulting design for the existing private sewage system for the subject property, followed by a field certification by C-42 license.

1. Description of Site and Proposal:

1.1 Prepared for: Sky Park / Santa's Village
C/O RWM & ASSOCITES, LLC.

1.2 Location of Land: See attached Map.

1.3 Proposed Development:

a. Proposed Development: bathroom facility
b. See Attached Map
c. An existing 2500 gallon septic Tank and leach lines.
d. See attached map.

1.4

a. Topography / site plan: See attached map.
b. Drainage from site is sheet flow to the north.
c. Vegetation: Dry grasses and brush with Pine and Oak Trees.
d. There are several existing structures on the site. There is existing structures on the adjacent parcel to the north. There is existing 20,000 water tank on site
e. There are no known wells within 100' of the proposed system. There are no streams within 50' of the proposed system. Historical well/ground water is 5.3' from well top of ground, therefore total separation between bottom of leach field and historical high ground water is 14.8' and leach field distance to well head is 222' to the southwest.
f. See attached drawings.
g. No ground water was encountered in any excavation.
h. No other features, which would affect the system, were observed at the site.
i. Leach lines and expansion areas will be located on natural ground as shown on the attached system layout.

2. Equipment:

2.1 Backhoe with a 24" bucket, manual posthole digger and tape measure.

3. Methodology and Procedures

3.1 Location of Borings: Random, See attached map.

3.2 Four holes were dug to a depth of six feet below original ground and one exploratory hole was dug to a depth of thirteen feet below original ground. The soils data developed as a result of the exploratory and test holes should be representative of the area where the system is to be constructed. However, additional data developed during system construction could result in relocation of the system or necessitate the use of a holding tank in lieu of the septic system. Any large rock encountered in the system area will be removed as necessary for construction.

3.3 Test holes were prepared and tests were performed in accordance with the simplified standard test procedures. See attached test sheet. Six-inch diameter holes were used.

4. Results:

4.1 Hole locations are shown on the attached map.
Hole #1 through #4
0 - 3' dark Brown Top Soil
3 – 6' dark Brown Soil with Light Tan D.G. intermixed.
Hole #5
0 - 3' dark Brown Top Soil
3' – 6' dark Brown Top with Light Tan D.G. intermixed.
6' – 13' dark Brown Soil with Light Tan D.G. intermixed
No unusual moisture was encountered in any excavation.

4.2.1 Design rate = 11.89 minutes per inch. Referring to the DEHS chart, 1.22 square foot per gallon was used. Therefore, 1.22(1050)/7 x 1.0 = 183 lineal feet of leach line using 3' X 3' gravel.

5. Discussion of Results:

5.1 Tests were fairly uniform, ranging from 6.35 to 10.88 with a design rate of 11.89 minutes per inch.

5.2 NA

6. Design:

6.1 Based on the above, the rate of 11.89 minutes per inch was used. See section 4.2.1.

6.2 See section 4.2.1 and the attached map

7. Plot: See attached Map.

8. Calculations

GENERAL BUILDING

Facilities	Quantity	"Units"	Total Units
Urinals	4	2	4
Water Closet	2	6	12
Wash Basin	4	2	8
			28

Summary

General building Per UPC, Table I-2, 51 Units = 1400

Flow: 1400/ .75 = (1050)

Volume = 1050

9. General Discussion:

9.1 By topography map the slope in area of leach lines is measured at approx. >10 %.

9.2 Based on all of the above data, it is my professional opinion that existing system with the certifications is and has sufficient area to handle the liquid wastes without creating a nuisance or contaminating the ground water and the system will meet the requirements of the Lahaton Regional Water Quality Control Board.

If you have any questions concerning this design review, please call.

Sincerely,

Bryant Bergeson, P.E.

PERCOLATION TEST SHEET A
PARCEL 1

Project:SKYPARK Job No.SEE TITLE REPORT

APN #332-211-02 Date:12/2014

By: R2-R3

Hole No.: *1 - 4* Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Soil Type: *See Report*

Hole No.	Time 1	H1 (Inches)	Time 2	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:00:00	*8"*	*1:08:14*	*7"*	8:14	*1"*	8.23
No. 2	1:01:36	*8"*	*1:12:28*	*7"*	10:52	*1"*	10.87
No. 3	1:02:28	*8"*	*1:07:05*	*7"*	4:37	*1"*	4.61
No. 4	1:04:06	*8"*	*1:07:55*	*7"*	3:49	*1"*	3.82
No. 1	1:08:15	*8"*	*1:12:30*	*7"*	4:15	*1"*	4.25
No. 2	1:13:28	*8"*	*1:21:57*	*7"*	8:37	*1"*	8.62
No. 3	1:07:17	*8"*	*1:22:13*	*7"*	14:56	*1"*	14.93
No. 4	1:08:30	*8"*	*1:12:22*	*7"*	3:52	*1"*	3.87

PERCOLATION TEST SHEET B
PARCEL 1

Project: SAME AS ABOVE Job No.

Date:

By:

Diameter: 6" Type: Hand Dug Depth: 8"

Hole No.: 1 - 4

Soil Type: See Report

Hole No.	Time 3	H1 (Inches)	Time 4	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:12:32	8"	1:18:50	7"	6:21	1"	6.35
No. 2	1:21:57	8"	1:32:50	7"	10:53	1"	10.88
No. 3	1:22:15	8"	1:31:37	7"	9:22	1"	9.37
No. 4	1:12:22	8"	1:19:30	7"	7:07	1"	7.13
No. 1	1:19:45	8"	1:28:10	7'	8:25	1"	8.42
No. 2	1:32:59	8"	1:42:33	7"	9:34	1"	9.57
No. 3	1:32:20	8"	1:42:35	7"	3:36	1"	10.25
No. 4	1:19:55	8"	1:28:47	7"	8:52	1"	8.87

Percolation Rate: 8.85 min./inch

(avg. + high) / 2 = 8.85 + 14.93 / 2 = 11.89

Adjusted Percolation Rate: 11.89 min./ inch

Pacific Surveys

a full service geophysical well logging company

Video Survey Report

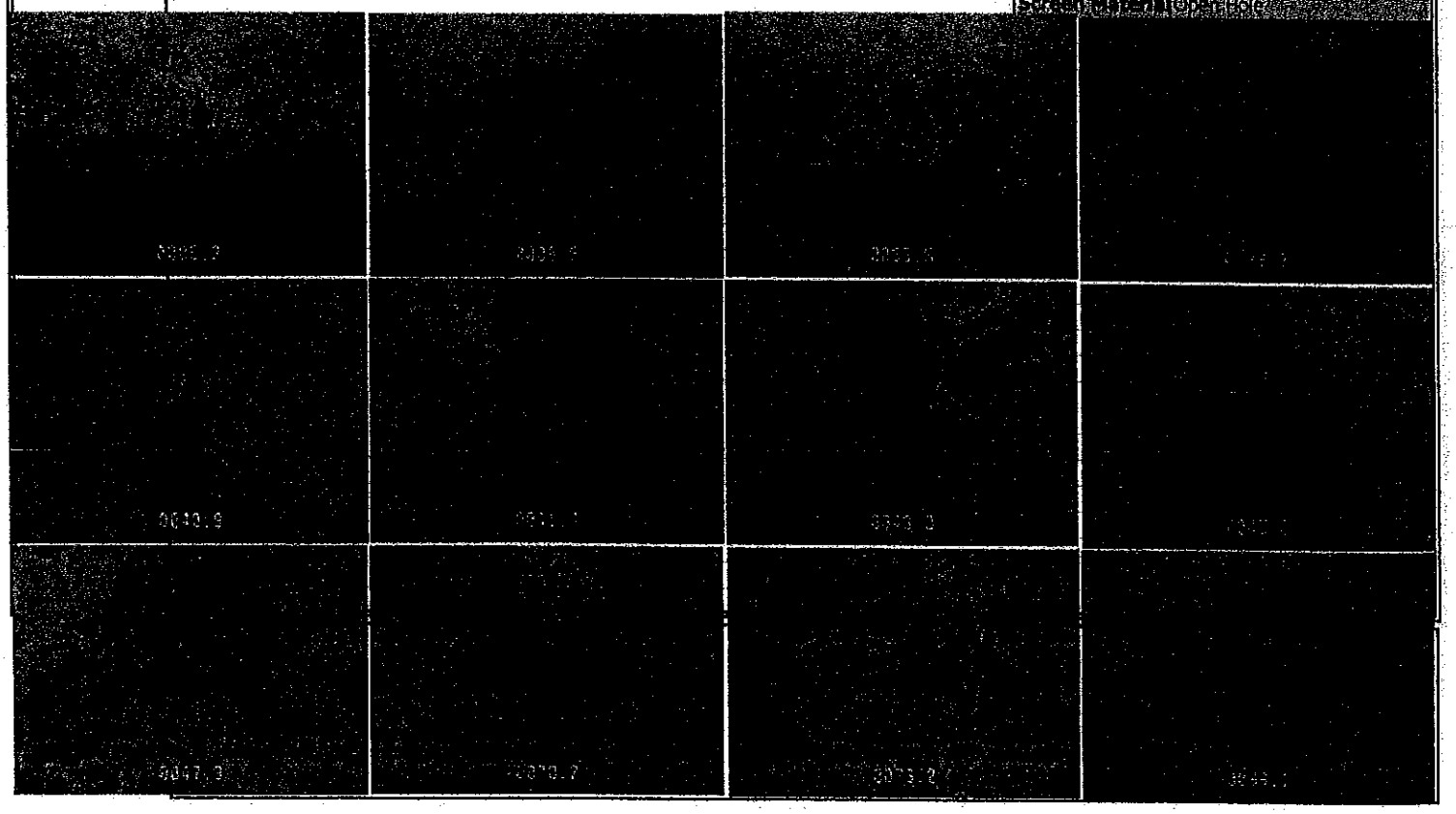
Company:	Harich Enterprises	**Date:**	04-Aug-14		
Well:	Meadow well 1	**Run No.**	One	**Truck**	PS-6
Field:	Skyforest	**Job Ticket:**	18613		
State:	Callfornia	**Total Depth:**	96 ft		
		Water Level:	5 ft	SWL	
Location:	Santa's Village	**Oil on Water:**	No	**Amount:**	0 ft
	GPS N34o14.023' W117o10.163'	**Operator:**	Nelson		
Zero Datum:	Top of CSG **Tool Zero:**	Side-Scan		**Dead Space**	2.00 ft
Reason for Survey:	General Inspection	**Guides Set @**	7.00 in		

Depth	Observations
0.0 ft	Start survey at top of survey.
5.3 ft	SWL; water cloudy, visibility poor.
8.9 ft	Heavy scale on casing.
35.5 ft	End of casing open hole.
39.3 ft	Fractured zone.
40.9 ft	Fractured zone with possible water production zone.
43.0 ft	Fractured zone with possible water production zone.
45.0 ft	Large fractured with possible water production zone.
47.9 ft	Break out fractured zone.
70.2 ft	Fractured zone.
73.2 ft	Large break out.
96.1 ft	Fill; end survey.

Perforation	From Survey
Open Hole	N/A

Casing Size	From Survey
8.00 in	0.00 ft to 35.50 ft
Open Hole	35.50 ft to 96.10 ft

Case Material	PVC
Case Width	Open Hole



800.919.7555
909.625.6262

4456 via st. ambrose
claremont ca 91711
www.pacificsurveys.com

fax: 909.399.3180

BUILDINGS #3 #4 #5 #6

County of San Bernardino • Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES

www.sbcounty.gov/dehe

PRIVATE SEWAGE DISPOSAL SYSTEM CERTIFICATION

Applicant shall complete top 3 lines only. Certification shall be completed, on both sides, by a licensed contractor (A ,B, or C-42) or other qualified professional (R.P.E., C.E.G., R.E.H.S., etc.) Use n/a where necessary. For information, please call 909-387-4666.

Property Owner: SKY PARK SANTA'S VILLAGE	Applicant Name:
Property Address: 28950 HWY. 18	APN: 0332-211-02, 0332-212-02
Type of Project (Specify) TR, PM, CUP, DR, LUR, etc:	File Index Number:

Number of Units	Garbage Disposal Y ☒ N ☐	Tank Last Pumped (mo. / yr.) 6/14
Bedrooms 0	Vacant Y ☒ N ☐ How Long (yrs.) N/A	Tank Age (yrs.) N/A
Bathrooms 0	Basement Y ☐ N ☒	Disposal Area Age (yrs.) N/A

Commercial Development	Type of Fixtures (per UPC) *Indicate type and number of each* BILLY'S PATIO	
	Total Number of Fixture Units ☒ 28	Grease Interceptor ☐ Clarifier ☐ None ☒

Type of Septic Tank (Specify) CEMENT		Dimensions (L x W x D) (ft.) 25'x5'x5'
Type of Cover (Specify) DIRT	Tank Capacity (Gallons) 2500	No. of Compartments 2
Specify Any Damage or Defects Observed: NONE		

Type of Disposal Area Seepage Pit ☐ Leachlines ☒ Other ☐ (Specify)		
Distance From Well N/A ft.	Distance from Foundation N/A ft.	Distance from Nearest Lot Line ☐ Front ☐ Side ☐ Rear
Specify Any Damage or Defects Observed:		

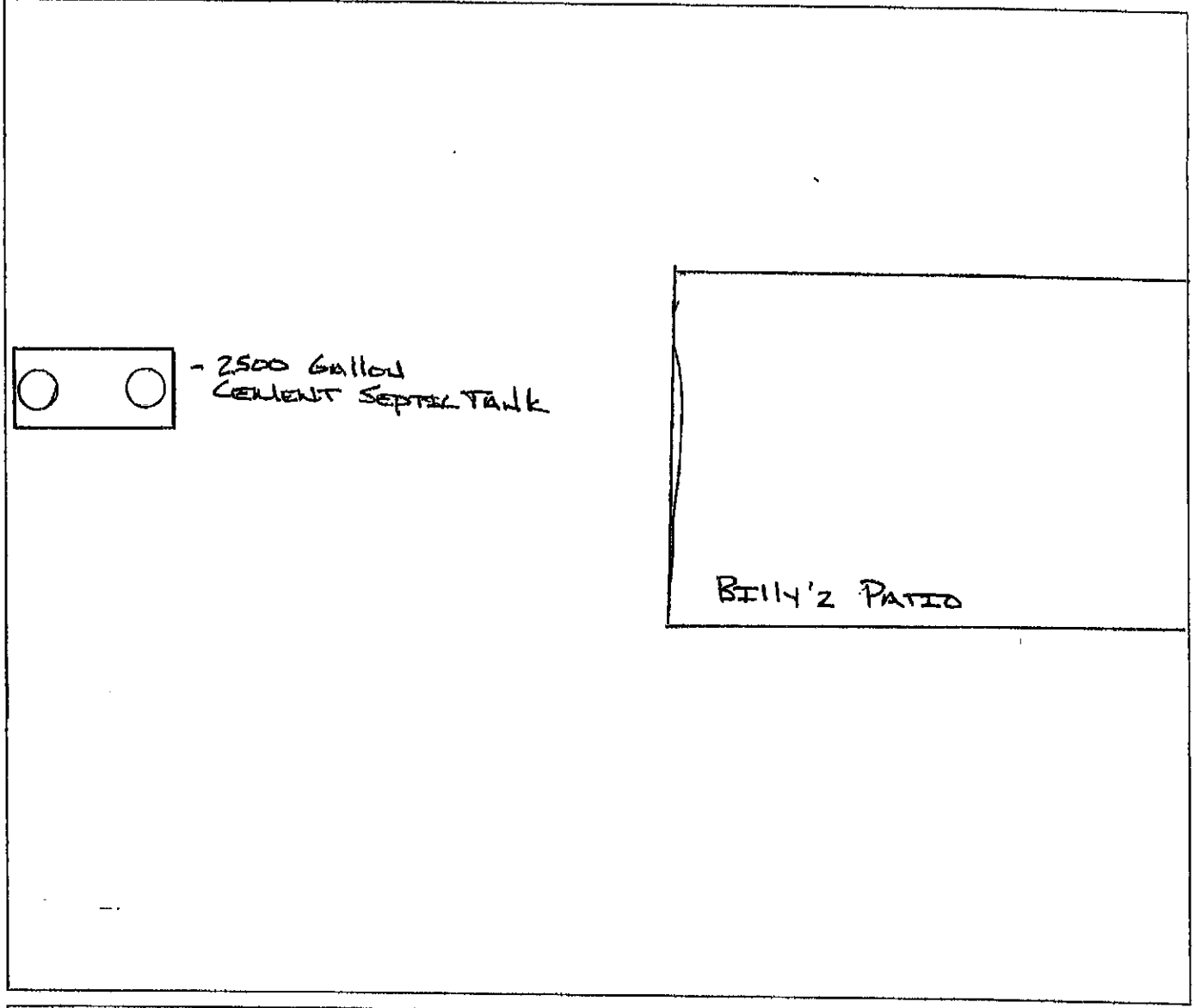
Seepage Pits	Number of Pits	Outside Diameter (ft.)	Depth (ft.)
	Depth of Pit Below Inlet (ft.)	Lining Material (Specify)	

Leachlines N/A	Number of Lines	Trench Width (in.)	Average Length of Lines (ft.)
	Total Absorption Area (sq. ft.) *Bottom of Trenches*		Depth (in.) *Finish Grade to Top of Line*
	Distance Between Lines (ft.)	Type of Filter Material Beneath Line (in.)	
	Depth of Material Above Line (in.)	Depth of Material Beneath Line (in.)	

Specify Indications of Previous System Failures (Odors, Seepage, etc.): *Use Additional paper if necessary*		
Dye Test Y ☐ N ☒	Hydraulic Test Y ☒ N ☐	NOTE: Attach test results and copies of building permits.

Tank & Disposal Area Information

In the space provided, show the location of the septic tank and disposal area in relation to the buildings and other landmarks (i.e. wells, trees, shrubs, driveways, parking, paving, drainage courses, property lines).



It is the opinion of the certifier that this sewage disposal system, ☐ Meets current code, ☒ Can be expected to function satisfactorily and is not likely to create any unsanitary conditions, OR ☐ Cannot be expected to function satisfactorily.

Date:	Signature:	Type of License:	Reg. Number:	Expiration:
7-24-14		C-42	363126	7/16

Name of Certifier:	Address:
Sean Bennett	P.O Box 1520, 92325

For DEHS Use Only

Reviewed By:	Date:
☐ Approved	☐ Not Approved - Reason

RWM & ASSOCIATES, LLC
Civil Engineering, Land Surveying and Building Design

P.O. Box 520, Twin Peaks, CA 92391
(909) 337-3058

San Bernardino County
Environmental Improvement Agency
Environmental Health Services
385 N. Arrowhead Avenue
San Bernardino, CA 92415

January 12, 2014

Attn: REHS
Re: Existing System Design
Sky Park - Santa's Village
APN: 340-271-06 BUILDING #18
28950 Hwy # 18, Sky Forest Ca.
Dear Sirs,

The following is the summary of the percolation test and the resulting design for the existing private sewage system for the subject property, followed by a field certification by C-42 license.

1. **Description of Site and Proposal:**
   - **1.1** Prepared for: Sky Park / Santa's Village
     C/O RWM & ASSOCITES, LLC.
   - **1.2** Location of Land: See attached Map.
   - **1.3** Proposed Development:
     a. Proposed Development: bathroom facility
     b. See Attached Map
     c. An existing 750 gallon septic Tank and leach lines.
     d. See attached map.
   - **1.4** a. Topography / site plan: See attached map.
     b. Drainage from site is sheet flow to the north.
     c. Vegetation: Dry grasses and brush with Pine and Oak Trees.
     d. There are several existing structures on the site. There is existing structures on the adjacent parcel to the north. There is existing 20,000 water tank on site
     e. There are no known wells within 100' of the proposed system. There are no streams within 50' of the proposed system. Historical well/ground water is 5.3' from well top of ground, therefore total separation between bottom of leach field and historical high ground water is 40.8' and leach field distance to well head is 618' to the northwest.
     f. See attached drawings.
     g. No ground water was encountered in any excavation.
     h. No other features, which would affect the system, were observed at the site.
     i. Leach lines and expansion areas will be located on natural ground as shown on the attached system layout.

2. Equipment:

2.1 Backhoe with a 24" bucket, manual posthole digger and tape measure.

3. Methodology and Procedures

3.1 Location of Borings: Random, See attached map.

3.2 Four holes were dug to a depth of six feet below original ground and one exploratory hole was dug to a depth of thirteen feet below original ground. The soils data developed as a result of the exploratory and test holes should be representative of the area where the system is to be constructed. However, additional data developed during system construction could result in relocation of the system or necessitate the use of a holding tank in lieu of the septic system. Any large rock encountered in the system area will be removed as necessary for construction.

3.3 Test holes were prepared and tests were performed in accordance with the simplified standard test procedures. See attached test sheet. Six-inch diameter holes were used.

4. Results:

4.1 Hole locations are shown on the attached map.
Hole #1 through #4
0 - 3' dark Brown Top Soil
3 – 6' dark Brown Soil with Light Tan D.G. intermixed.
Hole #5
0 - 3' dark Brown Top Soil
3' – 6' dark Brown Top with Light Tan D.G. intermixed.
6' – 13' dark Brown Soil with Light Tan D.G. intermixed
No unusual moisture was encountered in any excavation.

4.2.1 Design rate = 11.89 minutes per inch. Referring to the DEHS chart, .84 square foot per gallon was used. Therefore, .84(300)/7 x 1.0 = 40 lineal feet of leach line using 3' X 3' gravel.

5. Discussion of Results:

5.1 Tests were fairly uniform, ranging from 6.35 to 10.88 with a design rate of 11.89 minutes per inch.

5.2 NA

6. Design:

6.1 Based on the above, the rate of 11.89 minutes per inch was used. See section 4.2.1.

6.2 See section 4.2.1 and the attached map

7. Plot: See attached Map.

8. Calculations

GENERAL BUILDING

Facilities	Quantity	"Units"	Total Units
Urinals	3	2	6
Wash Basin	1.5	2	3
			9

Summary

General building Per UPC, Table I-2, 51 Units = 600

Flow: 400/ .75 = (300)

Volume = 300

9. General Discussion:

9.1 By topography map the slope in area of leach lines is measured at approx. >10 %.

9.2 Based on all of the above data, it is my professional opinion that existing system with the certifications is and has sufficient area to handle the liquid wastes without creating a nuisance or contaminating the ground water and the system will meet the requirements of the Lahaton Regional Water Quality Control Board.

If you have any questions concerning this design review, please call.

Sincerely,

Bryant Bergeson, P.E.

PERCOLATION TEST SHEET A
PARCEL 1

Project:SKYPARK Job No.SEE TITLE REPORT

APN #332-211-02 Date:12/2014

By: R2-R3

Hole No.: *1 - 4* Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Soil Type: *See Report*

Hole No.	Time 1	H1 (Inches)	Time 2	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:00:00	*8"*	*1:08:14*	*7"*	8:14	*1"*	8.23
No. 2	1:01:36	*8"*	*1:12:28*	*7"*	10:52	*1"*	10.87
No. 3	1:02:28	*8"*	*1:07:05*	*7"*	4:37	*1"*	4.61
No. 4	1:04:06	*8"*	*1:07:55*	*7"*	3:49	*1"*	3.82
No. 1	1:08:15	*8"*	*1:12:30*	*7"*	4:15	*1"*	4.25
No. 2	1:13:28	*8"*	*1:21:57*	*7"*	8:37	*1"*	8.62
No. 3	1:07:17	*8"*	*1:22:13*	*7"*	14:56	*1"*	14.93
No. 4	1:08:30	*8"*	*1:12:22*	*7"*	3:52	*1"*	3.87

PERCOLATION TEST SHEET B
PARCEL 1

Project: SAME AS ABOVE _____ Job No. _____

_____ Date: _____

_____ By: _____

_____ Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Hole No.: *1 - 4*

Soil Type: *See Report*

Hole No.	Time 3	H1 (Inches)	Time 4	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:12:32	*8"*	*1:18:50*	*7"*	6:21	*1"*	6.35
No. 2	1:21:57	*8"*	*1:32:50*	*7"*	10:53	*1"*	10.88
No. 3	1:22:15	*8"*	*1:31:37*	*7"*	9:22	*1"*	9.37
No. 4	1:12:22	*8"*	*1:19:30*	*7"*	7:07	*1"*	7.13
No. 1	1:19:45	*8"*	*1:28:10*	*7'*	8:25	*1"*	8.42
No. 2	1:32:59	*8"*	*1:42:33*	*7"*	9:34	*1"*	9.57
No. 3	1:32:20	*8"*	*1:42:35*	*7"*	3:36	*1"*	10.25
No. 4	1:19:55	*8"*	*1:28:47*	*7"*	8:52	*1"*	8.87

Percolation Rate: 8.85 min./inch

(avg. + high) / 2 = 8.85 + 14.93 / 2 = 11.89

Adjusted Percolation Rate: 11.89 min./ inch

Pacific Surveys

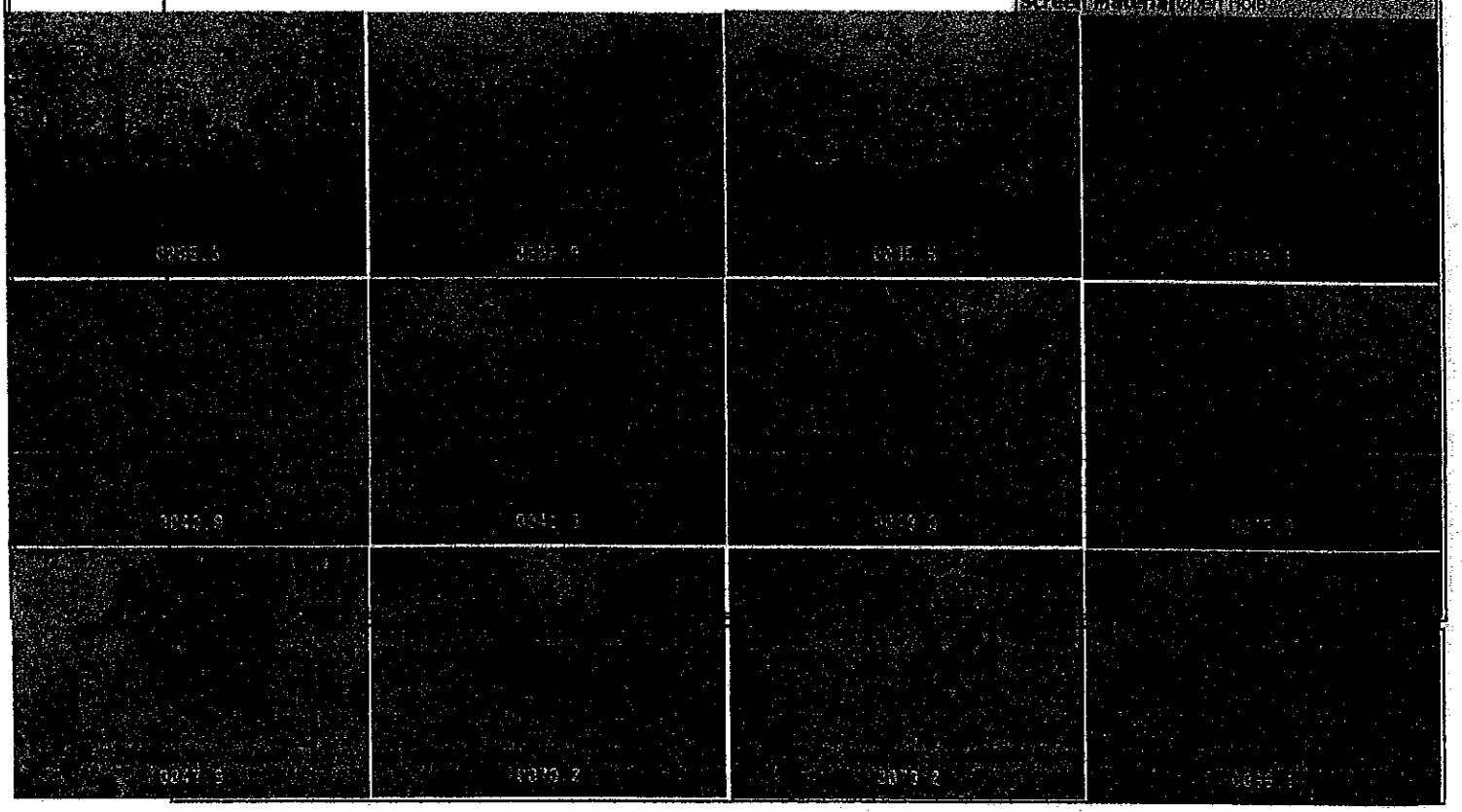
a full service geophysical well logging company

Video Survey Report

Company:	Harich Enterprises	**Date:**	04-Aug-14		
Well:	Meadow well 1	**Run No.**	One	**Truck**	PS-6
Field:	Skyforest	**Job Ticket:**	18613		
State:	California	**Total Depth:**	96 ft		
		Water Level:	5 ft	SWL	
Location:	Santa's Village	**Oil on Water:**	No	**Amount:**	0 ft
	GPS N34o14.023' W117o10.163'	**Operator:**	Nelson		
Zero Datum:	Top of CSG	**Tool Zero:**	Side-Scan	**Dead Space**	2.00 ft
Reason for Survey:	General Inspection	**Guides Set @**	7.00 in		

Depth	Observations
0.0 ft	Start survey at top of survey.
5.3 ft	SWL; water cloudy, visibility poor.
8.9 ft	Heavy scale on casing.
35.5 ft	End of casing open hole.
39.3 ft	Fractured zone.
40.9 ft	Fractured zone with possible water production zone.
43.0 ft	Fractured zone with possible water production zone.
45.0 ft	Large fractured with possible water production zone.
47.9 ft	Break out fractured zone.
70.2 ft	Fractured zone.
73.2 ft	Large break out.
96.1 ft	Fill; end survey.

Perforation:	**From Survey**
Open Hole	N/A
Casing Size	**From Survey**
8.00 in	0.00 ft to 35.50 ft
Open Hole	35.50 ft to 96.10 ft
CSG Material	PVC
Screen Material	Open Hole



800.919.7555
909.625.6262

4456 via st. ambrose
claremont ca 91711
www.pacificsurveys.com

fax: 909.399.3180

BUILDING #18

County of San Bernardino • Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES

www.sbcounty.gov/dehs

PRIVATE SEWAGE DISPOSAL SYSTEM CERTIFICATION

Applicant shall complete top 3 lines only. Certification shall be completed, on both sides, by a licensed contractor (A ,B, or C-42) or other qualified professional (R.P.E., C.E.G., R.E.H.S., etc.) Use n/a where necessary. For information, please call 909-387-4666.

Property Owner: SKY PARK, SANTA'S VILLAGE	Applicant Name:
Property Address: 28950 HWY 18	APN: 0332-211-02, 0332-212-02
Type of Project (Specify) TR, PM, CUP, DR, LUR, etc:	File Index Number:

Number of Units	Garbage Disposal Y ☒ N ☐	Tank Last Pumped (mo. / yr.) 6/14
Bedrooms 0	Vacant Y ☒ N ☐ How Long (yrs.) N/A	Tank Age (yrs.) N/A
Bathrooms 0	Basement Y ☐ N ☒	Disposal Area Age (yrs.) N/A

Commercial Development	Type of Fixtures (per UPC) *Indicate type and number of each* BAKERY	
	Total Number of Fixture Units ☒ 9	Grease Interceptor ☐ Clarifier ☐ None ☒

Type of Septic Tank (Specify) CEMENT		Dimensions (L x W x D) (ft.) 8' x 5' x 5'
Type of Cover (Specify) DIRT	Tank Capacity (Gallons) 750	No. of Compartments 2
Specify Any Damage or Defects Observed: NONE		

Type of Disposal Area Seepage Pit ☐ Leachlines ☒ Other ☐ (Specify)		
Distance From Well N/A ft.	Distance from Foundation N/A ft.	Distance from Nearest Lot Line ☐ Front ☐ Side ☐ Rear
Specify Any Damage or Defects Observed:		

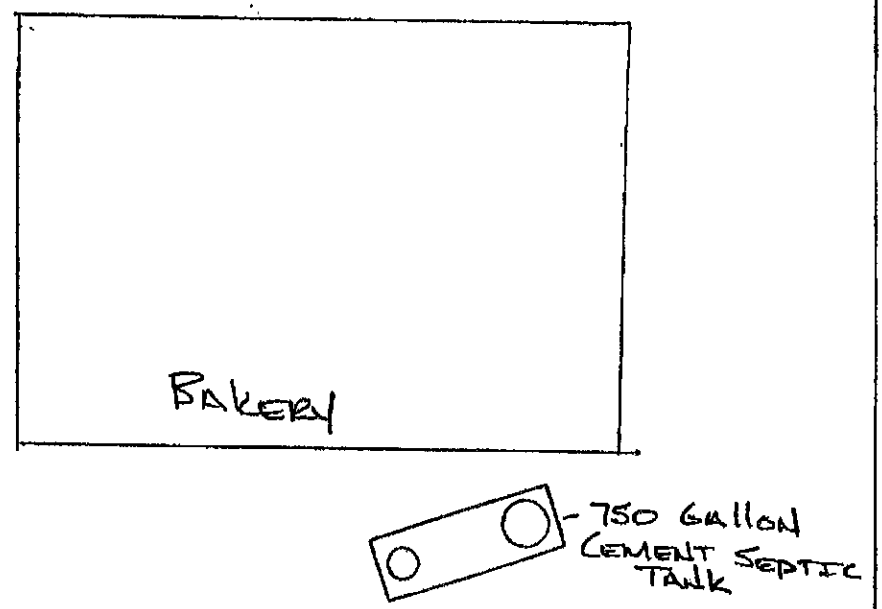
Seepage Pits	Number of Pits	Outside Diameter (ft.)	Depth (ft.)
	Depth of Pit Below Inlet (ft.)	Lining Material (Specify)	

Leachlines N/A	Number of Lines	Trench Width (in.)	Average Length of Lines (ft.)
	Total Absorption Area (sq. ft.) *Bottom of Trenches*		Depth (in.) *Finish Grade to Top of Line*
	Distance Between Lines (ft.)	Type of Filter Material Beneath Line (in.)	
	Depth of Material Above Line (in.)	Depth of Material Beneath Line (in.)	

Specify Indications of Previous System Failures (Odors, Seepage, etc.): *Use Additional paper if necessary*		
Dye Test Y ☐ N ☒	Hydraulic Test Y ☒ N ☐	NOTE: Attach test results and copies of building permits.

Tank & Disposal Area Information

In the space provided, show the location of the septic tank and disposal area in relation to the buildings and other landmarks (i.e. wells, trees, shrubs, driveways, parking, paving, drainage courses, property lines).



It is the opinion of the certifier that this sewage disposal system, ☐ Meets current code, ☒ Can be expected to function satisfactorily and is not likely to create any unsanitary conditions. OR ☐ Cannot be expected to function satisfactorily.

Date:	Signature:	Type of License:	Reg. Number:	Expiration:
7-24-14		C-42	363126	7/16

Name of Certifier:	Address:
SEAN BENNETT	P.O BOX 1520, 92375

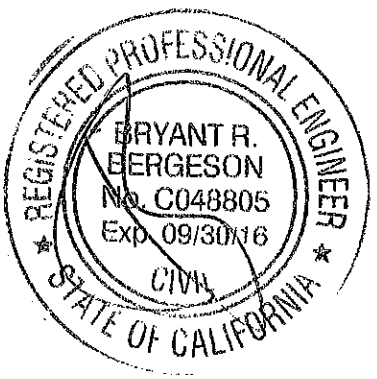
For DEHS Use Only

Reviewed By:	Date:
☐ Approved	☐ Not Approved - Reason

RWM & ASSOCIATES, LLC
Civil Engineering, Land Surveying and Building Design
P.O. Box 520, Twin Peaks, CA 92391
(909) 337-3058

San Bernardino County
Environmental Improvement Agency
Environmental Health Services
385 N. Arrowhead Avenue
San Bernardino, CA 92415

January 12, 2014



Attn: REHS
Re: Existing System Design
Sky Park - Santa's Village
APN: 340-271-06 BUILDING #14
28950 Hwy # 18, Sky Forest Ca.
Dear Sirs,

The following is the summary of the percolation test and the resulting design for the existing private sewage system for the subject property, followed by a field certification by C-42 license.

1. **Description of Site and Proposal:**
   - **1.1** Prepared for: Sky Park / Santa's Village
     C/O RWM & ASSOCITES, LLC.
   - **1.2** Location of Land: See attached Map.
   - **1.3** Proposed Development:
     a. Proposed Development: bathroom facility
     b. See Attached Map
     c. An existing 1500 gallon septic Tank and leach lines.
     d. See attached map.
   - **1.4** a. Topography / site plan: See attached map.
     b. Drainage from site is sheet flow to the north.
     c. Vegetation: Dry grasses and brush with Pine and Oak Trees.
     d. There are several existing structures on the site. There is existing structures on the adjacent parcel to the north. There is existing 20,000 water tank on site
     e. There are no known wells within 100' of the proposed system. There are no streams within 50' of the proposed system. Historical well/ground water is 5.3' from well top of ground, therefore total separation between bottom of leach field and historical high ground water is 50.8' and leach field distance to well head is 866' to the northwest.
     f. See attached drawings.
     g. No ground water was encountered in any excavation.
     h. No other features, which would affect the system, were observed at the site.
     i. Leach lines and expansion areas will be located on natural ground as shown on the attached system layout.

2. Equipment:

2.1 Backhoe with a 24" bucket, manual posthole digger and tape measure.

3. Methodology and Procedures

3.1 Location of Borings: Random, See attached map.

3.2 Four holes were dug to a depth of six feet below original ground and one exploratory hole was dug to a depth of thirteen feet below original ground. The soils data developed as a result of the exploratory and test holes should be representative of the area where the system is to be constructed. However, additional data developed during system construction could result in relocation of the system or necessitate the use of a holding tank in lieu of the septic system. Any large rock encountered in the system area will be removed as necessary for construction.

3.3 Test holes were prepared and tests were performed in accordance with the simplified standard test procedures. See attached test sheet. Six-inch diameter holes were used.

4. Results:

4.1 Hole locations are shown on the attached map.
Hole #1 through #4
0 - 3' dark Brown Top Soil
3 – 6' dark Brown Soil with Light Tan D.G. intermixed.
Hole #5
0 - 3' dark Brown Top Soil
3' – 6' dark Brown Top with Light Tan D.G. intermixed.
6' – 13' dark Brown Soil with Light Tan D.G. intermixed
No unusual moisture was encountered in any excavation.

4.2.1 Design rate = 11.89 minutes per inch. Referring to the DEHS chart, .95 square foot per gallon was used. Therefore, .95(450)/7 x 1.0 = 61 lineal feet of leach line using 3' X 3' gravel.

5. Discussion of Results:

5.1 Tests were fairly uniform, ranging from 6.35 to 10.88 with a design rate of 11.89 minutes per inch.

5.2 NA

6. Design:

6.1 Based on the above, the rate of 11.89 minutes per inch was used. See section 4.2.1.

6.2 See section 4.2.1 and the attached map

7. Plot: See attached Map.

8. Calculations

GENERAL BUILDING

Facilities	Quantity	"Units"	Total Units
Urinals	4	2	4
Water Closet	1	6	6
Wash Basin	1	2	2
			12

Summary

General building Per UPC, Table I-2, 51 Units = 600

Flow: 600/ .75 = (450)

Volume = 450

9. General Discussion:

9.1 By topography map the slope in area of leach lines is measured at approx. >10 %.

9.2 Based on all of the above data, it is my professional opinion that existing system with the certifications is and has sufficient area to handle the liquid wastes without creating a nuisance or contaminating the ground water and the system will meet the requirements of the Lahaton Regional Water Quality Control Board.

If you have any questions concerning this design review, please call.

Sincerely,

Bryant Bergeson, P.E.

PERCOLATION TEST SHEET A
PARCEL 1

Project:SKYPARK Job No.SEE TITLE REPORT

APN #332-211-02 Date:12/2014

By: R2-R3

Hole No.: *1 - 4* Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Soil Type: *See Report*

Hole No.	Time 1	H1 (Inches)	Time 2	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:00:00	*8"*	*1:08:14*	*7"*	8:14	*1"*	8.23
No. 2	1:01:36	*8"*	*1:12:28*	*7"*	10:52	*1"*	10.87
No. 3	1:02:28	*8"*	*1:07:05*	*7"*	4:37	*1"*	4.61
No. 4	1:04:06	*8"*	*1:07:55*	*7"*	3:49	*1"*	3.82
No. 1	1:08:15	*8"*	*1:12:30*	*7"*	4:15	*1"*	4.25
No. 2	1:13:28	*8"*	*1:21:57*	*7"*	8:37	*1"*	8.62
No. 3	1:07:17	*8"*	*1:22:13*	*7"*	14:56	*1"*	14.93
No. 4	1:08:30	*8"*	*1:12:22*	*7"*	3:52	*1"*	3.87

PERCOLATION TEST SHEET B
PARCEL 1

Project: SAME AS ABOVE _____ Job No. _____

_____ Date: _____

_____ By: _____

_____ Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Hole No.: *1 - 4*

Soil Type: *See Report*

Hole No.	Time 3	H1 (Inches)	Time 4	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:12:32	*8"*	*1:18:50*	*7"*	6:21	*1"*	6.35
No. 2	1:21:57	*8"*	*1:32:50*	*7"*	10:53	*1"*	10.88
No. 3	1:22:15	*8"*	*1:31:37*	*7"*	9:22	*1"*	9.37
No. 4	1:12:22	*8"*	*1:19:30*	*7"*	7:07	*1"*	7.13
No. 1	1:19:45	*8"*	*1:28:10*	*7'*	8:25	*1"*	8.42
No. 2	1:32:59	*8"*	*1:42:33*	*7"*	9:34	*1"*	9.57
No. 3	1:32:20	*8"*	*1:42:35*	*7"*	3:36	*1"*	10.25
No. 4	1:19:55	*8"*	*1:28:47*	*7"*	8:52	*1"*	8.87

Percolation Rate: 8.85 min./inch

(avg. + high) / 2 = 8.85 + 14.93 / 2 = 11.89

Adjusted Percolation Rate: 11.89 min./ inch

Pacific Surveys

a full service geophysical well logging company

Video Survey Report

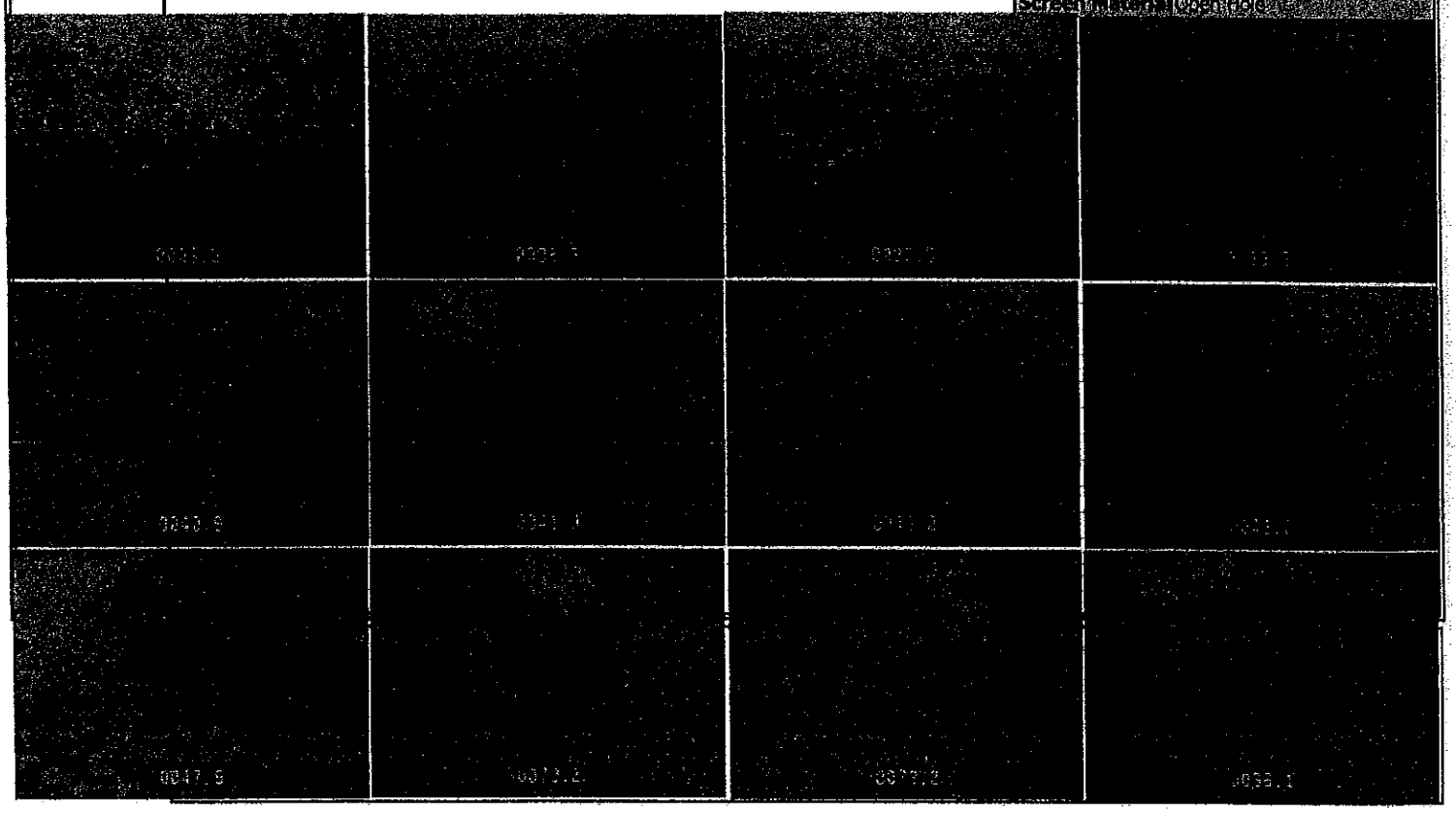
Company:	Harich Enterprises	**Date:**	04-Aug-14		
Well:	Meadow well 1	**Run No.**	One	**Truck**	PS-6
Field:	Skyforest	**Job Ticket:**	18613		
State:	California	**Total Depth:**	96 ft		
		Water Level:	5 ft	SWL	
Location:	Santa's Village	**Oil on Water:**	No	**Amount:**	0 ft
	GPS N34o14.023' W117o10.163'	**Operator:**	Nelson		
Zero Datum:	Top of CSG **Tool Zero:**	Side-Scan		**Dead Space**	2.00 ft
Reason for Survey:	General Inspection	**Guides Set @**	7.00 in		

Depth	Observations
0.0 ft	Start survey at top of survey.
5.3 ft	SWL; water cloudy, visibility poor.
8.9 ft	Heavy scale on casing.
35.5 ft	End of casing open hole.
39.3 ft	Fractured zone.
40.9 ft	Fractured zone with possible water production zone.
43.0 ft	Fractured zone with possible water production zone.
45.0 ft	Large fractured with possible water production zone.
47.9 ft	Break out fractured zone.
70.2 ft	Fractured zone.
73.2 ft	Large break out.
96.1 ft	Fill; end survey.

Perforation	From Survey
Open Hole	N/A

Casing Size	From Survey
8.00 in	0.00 ft to 35.50 ft
Open Hole	35.50 ft to 96.10 ft

Casing Material	PVC
Screen Material	Open Hole



800.919.7555
909.625.6262

4456 via st. ambrose
claremont ca 91711
www.pacificsurveys.com

fax: 909.399.3180

BUILDING #14

County of San Bernardino • Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES

www.sbcounty.gov/dehs

PRIVATE SEWAGE DISPOSAL SYSTEM CERTIFICATION

Applicant shall complete top 3 lines only. Certification shall be completed, on both sides, by a licensed contractor (A ,B, or C-42) or other qualified professional (R.P.E., C.E.G., R.E.H.S., etc.) Use n/a where necessary. For information, please call 909-387-4666.

Property Owner: SKY PARK, SANTA'S VILLAGE	Applicant Name:
Property Address: 28950 HWY 18	APN: 0332-211-02, 0332-212-02
Type of Project (Specify) TR, PM, CUP, DR, LUR, etc:	File Index Number:

Number of Units	Garbage Disposal Y ☐ N ☒		Tank Last Pumped (mo. / yr.) 6/14
Bedrooms 0	Vacant Y ☒ N ☐	How Long (yrs.) N/A	Tank Age (yrs.) N/A
Bathrooms 0	Basement Y ☐ N ☒		Disposal Area Age (yrs.) N/A

Commercial Development	Type of Fixtures (per UPC) *Indicate type and number of each* UPPER BATHROOM	
	Total Number of Fixture Units ☒ 12	Grease Interceptor ☐ Clarifier ☐ None ☒

Type of Septic Tank (Specify) STEEL		Dimensions (L x W x D) (ft.) 15' x 5' x 5'
Type of Cover (Specify) DIRT	Tank Capacity (Gallons) 1500	No. of Compartments 2
Specify Any Damage or Defects Observed: NONE		

Type of Disposal Area Seepage Pit ☐ Leachlines ☒ Other ☐ (Specify)		
Distance From Well N/A ft.	Distance from Foundation N/A ft.	Distance from Nearest Lot Line ☐ Front ☐ Side ☐ Rear
Specify Any Damage or Defects Observed:		

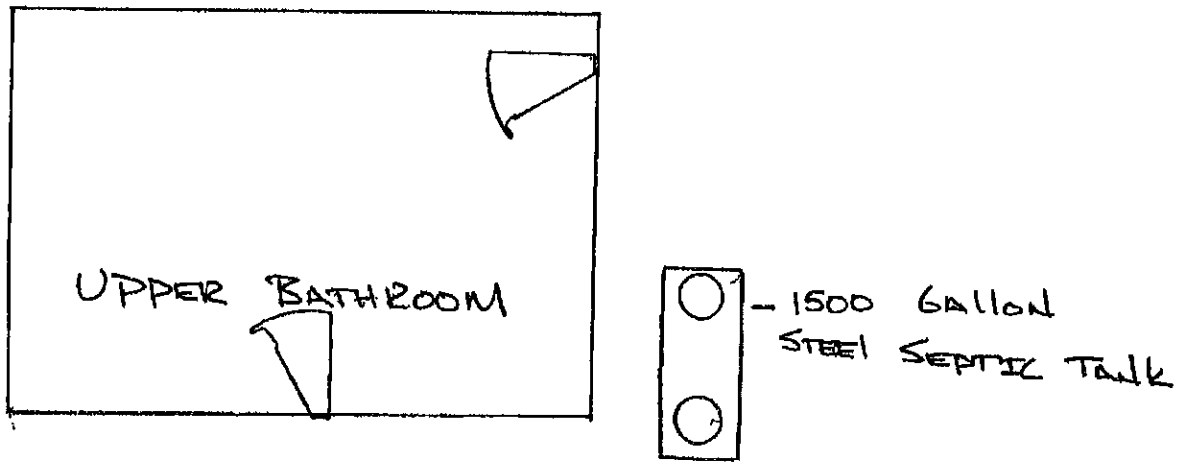
Seepage Pits	Number of Pits	Outside Diameter (ft.)	Depth (ft.)
	Depth of Pit Below Inlet (ft.)	Lining Material (Specify)	

Leachlines N/A	Number of Lines	Trench Width (in.)	Average Length of Lines (ft.)
	Total Absorption Area (sq. ft.) *Bottom of Trenches*		Depth (in.) *Finish Grade to Top of Line*
	Distance Between Lines (ft.)	Type of Filter Material Beneath Line (in.)	
	Depth of Material Above Line (in.)	Depth of Material Beneath Line (in.)	

Specify Indications of Previous System Failures (Odors, Seepage, etc.): *Use Additional paper if necessary*		
Dye Test Y ☐ N ☒	Hydraulic Test Y ☒ N ☐	NOTE: Attach test results and copies of building permits.

Tank & Disposal Area Information

In the space provided, show the location of the septic tank and disposal area in relation to the buildings and other landmarks (i.e. wells, trees, shrubs, driveways, parking, paving, drainage courses, property lines).



It is the opinion of the certifier that this sewage disposal system, ☐ Meets current code, ☒ Can be expected to function satisfactorily and is not likely to create any unsanitary conditions. OR ☐ Cannot be expected to function satisfactorily.

Date:	Signature:	Type of License:	Reg. Number:	Expiration:
7-24-14		C-42	363126	7/16

Name of Certifier:	Address:
SEAN BENNETT	P.O BOX 1520, 92325

For DEHS Use Only

Reviewed By:	Date:
☐ Approved	☐ Not Approved - Reason

RWM & ASSOCIATES, LLC
Civil Engineering, Land Surveying and Building Design
P.O. Box 520, Twin Peaks, CA 92391
(909) 337-3058

San Bernardino County
Environmental Improvement Agency
Environmental Health Services
385 N. Arrowhead Avenue
San Bernardino, CA 92415

January 12, 2014

Attn: REHS
Re: Existing System Design
Sky Park - Santa's Village
APN: 340-271-06 BUILDING #7 & #8
28950 Hwy # 18, Sky Forest Ca.

Dear Sirs,

The following is the summary of the percolation test and the resulting design for the existing private sewage system for the subject property, followed by a field certification by C-42 license.

1. **Description of Site and Proposal:**
   - **1.1** Prepared for: Sky Park / Santa's Village
     C/O RWM & ASSOCITES, LLC.
   - **1.2** Location of Land: See attached Map.
   - **1.3** Proposed Development:
     a. Proposed Development: bathroom facility
     b. See Attached Map
     c. An existing 750 gallon septic Tank and leach lines.
     d. See attached map.
   - **1.4** a. Topography / site plan: See attached map.
     b. Drainage from site is sheet flow to the north.
     c. Vegetation: Dry grasses and brush with Pine and Oak Trees.
     d. There are several existing structures on the site. There is existing structures on the adjacent parcel to the north. There is existing 20,000 water tank on site
     e. There are no known wells within 100' of the proposed system. There are no streams within 50' of the proposed system. Historical well/ground water is 5.3' from well top of ground, therefore total separation between bottom of leach field and historical high ground water is 29.8' and leach field distance to well head is 438' to the southwest.
     f. See attached drawings.
     g. No ground water was encountered in any excavation.
     h. No other features, which would affect the system, were observed at the site.
     i. Leach lines and expansion areas will be located on natural ground as shown on the attached system layout.

2. Equipment:

2.1 Backhoe with a 24" bucket, manual posthole digger and tape measure.

3. Methodology and Procedures

3.1 Location of Borings: Random, See attached map.

3.2 Four holes were dug to a depth of six feet below original ground and one exploratory hole was dug to a depth of thirteen feet below original ground. The soils data developed as a result of the exploratory and test holes should be representative of the area where the system is to be constructed. However, additional data developed during system construction could result in relocation of the system or necessitate the use of a holding tank in lieu of the septic system. Any large rock encountered in the system area will be removed as necessary for construction.

3.3 Test holes were prepared and tests were performed in accordance with the simplified standard test procedures. See attached test sheet. Six-inch diameter holes were used.

4. Results:

4.1 Hole locations are shown on the attached map.
Hole #1 through #4
0 - 3' dark Brown Top Soil
3 – 6' dark Brown Soil with Light Tan D.G. intermixed.
Hole #5
0 - 3' dark Brown Top Soil
3' – 6' dark Brown Top with Light Tan D.G. intermixed.
6' – 13' dark Brown Soil with Light Tan D.G. intermixed
No unusual moisture was encountered in any excavation.

4.2.1 Design rate = 11.89 minutes per inch. Referring to the DEHS chart, .7 square foot per gallon was used. Therefore, .7(150)/7 x 1.0 = 25 min. lineal feet of leach line using 3' X 3' gravel.

5. Discussion of Results:

5.1 Tests were fairly uniform, ranging from 6.35 to 10.88 with a design rate of 11.89 minutes per inch.

5.2 NA

6. Design:

6.1 Based on the above, the rate of 11.89 minutes per inch was used. See section 4.2.1.

6.2 See section 4.2.1 and the attached map

7. Plot: See attached Map.

8. Calculations

GENERAL BUILDING

Facilities	Quantity	"Units"	Total Units
Urinals	4	2	4
			4

Summary

General building Per UPC, Table I-2, 51 Units = 200

Flow: 200/ .75 = (150)

Volume = 150

9. General Discussion:

9.1 By topography map the slope in area of leach lines is measured at approx. >10 %.

9.2 Based on all of the above data, it is my professional opinion that existing system with the certifications is and has sufficient area to handle the liquid wastes without creating a nuisance or contaminating the ground water and the system will meet the requirements of the Lahaton Regional Water Quality Control Board.

If you have any questions concerning this design review, please call.

Sincerely,

Bryant Bergeson, P.E.

PERCOLATION TEST SHEET A
PARCEL 1

Project:SKYPARK Job No.SEE TITLE REPORT

APN #332-211-02 Date:12/2014

By: R2-R3

Hole No.: *1 - 4* Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Soil Type: *See Report*

Hole No.	Time 1	H1 (Inches)	Time 2	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:00:00	*8"*	*1:08:14*	*7"*	8:14	*1"*	8.23
No. 2	1:01:36	*8"*	*1:12:28*	*7"*	10:52	*1"*	10.87
No. 3	1:02:28	*8"*	*1:07:05*	*7"*	4:37	*1"*	4.61
No. 4	1:04:06	*8"*	*1:07:55*	*7"*	3:49	*1"*	3.82
No. 1	1:08:15	*8"*	*1:12:30*	*7"*	4:15	*1"*	4.25
No. 2	1:13:28	*8"*	*1:21:57*	*7"*	8:37	*1"*	8.62
No. 3	1:07:17	*8"*	*1:22:13*	*7"*	14:56	*1"*	14.93
No. 4	1:08:30	*8"*	*1:12:22*	*7"*	3:52	*1"*	3.87

PERCOLATION TEST SHEET B
PARCEL 1

Project: SAME AS ABOVE _____ Job No. _____

_____ Date: _____

_____ By: _____

_____ Diameter: *6"* Type: *Hand Dug* Depth: *8"*

Hole No.: *1 - 4*

Soil Type: *See Report*

Hole No.	Time 3	H1 (Inches)	Time 4	H2 (Inches)	Δt (minutes)	ΔH (inches)	R Min. / Inch
No. 1	1:12:32	*8"*	*1:18:50*	*7"*	6:21	*1"*	6.35
No. 2	1:21:57	*8"*	*1:32:50*	*7"*	10:53	*1"*	10.88
No. 3	1:22:15	*8"*	*1:31:37*	*7"*	9:22	*1"*	9.37
No. 4	1:12:22	*8"*	*1:19:30*	*7"*	7:07	*1"*	7.13
No. 1	1:19:45	*8"*	*1:28:10*	*7'*	8:25	*1"*	8.42
No. 2	1:32:59	*8"*	*1:42:33*	*7"*	9:34	*1"*	9.57
No. 3	1:32:20	*8"*	*1:42:35*	*7"*	3:36	*1"*	10.25
No. 4	1:19:55	*8"*	*1:28:47*	*7"*	8:52	*1"*	8.87

Percolation Rate: 8.85 min./inch

(avg. + high) / 2 = 8.85 + 14.93 / 2 = 11.89

Adjusted Percolation Rate: 11.89 min./ inch

Pacific Surveys

A full service Geophysical well logging company

Video Survey Report

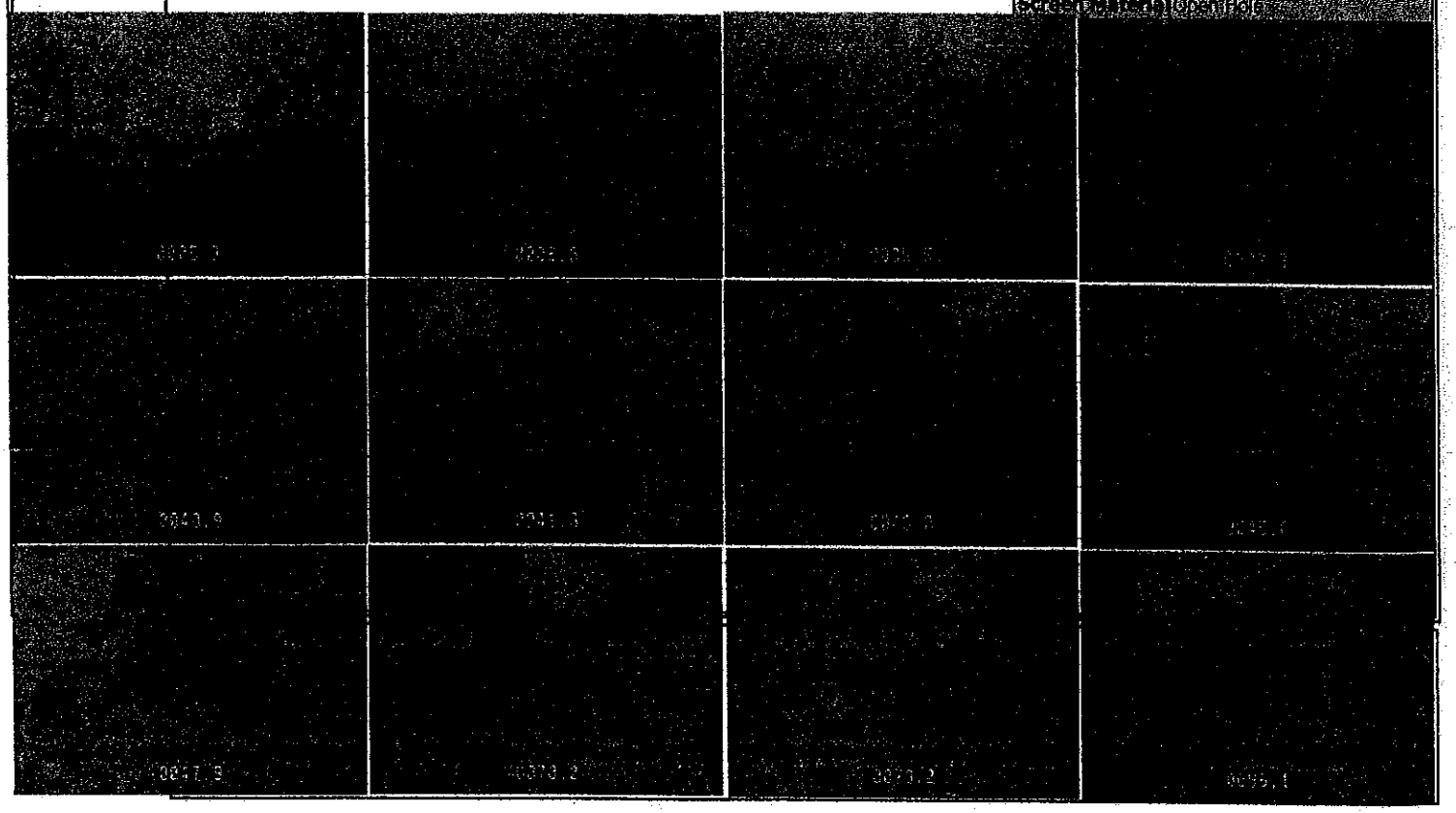
Company:	Harlch Enterprises	**Date:**	04-Aug-14		
Well:	Meadow well 1	**Run No.**	One	**Truck**	PS-6
Field:	Skyforest	**Job Ticket:**	18613		
State:	California	**Total Depth:**	96 ft		
		Water Level:	5 ft	SWL	
Location:	Santa's Village	**Oil on Water:**	No	**Amount:**	0 ft
	GPS N34o14.023' W117o10.163'	**Operator:**	Nelson		
Zero Datum:	Top of CSG **Tool Zero:**	Side-Scan		**Dead Space**	2.00 ft
Reason for Survey:	General Inspection	**Guides Set @**	7.00 in		

Depth	Observations
0.0 ft	Start survey at top of survey.
5.3 ft	SWL; water cloudy, visibility poor.
8.9 ft	Heavy scale on casing.
35.5 ft	End of casing open hole.
39.3 ft	Fractured zone.
40.9 ft	Fractured zone with possible water production zone.
43.0 ft	Fractured zone with possible water production zone.
45.0 ft	Large fractured with possible water production zone.
47.9 ft	Break out fractured zone.
70.2 ft	Fractured zone.
73.2 ft	Large break out.
96.1 ft	Fill; end survey.

Perforation:	From Survey
Open Hole	N/A

Casing Size	From Survey
8.00 in	0.00 ft to 35.50ft
Open Hole	35.50 ft to 96.10ft

CSG Material	PVC
Extra Material	Open Hole



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909.625.6262

4456 via st. ambrose
claremont ca 91711
www.pacificsurveys.com

fax: 909.399.3180

BUILDINGS #8 #7

County of San Bernardino • Department of Public Health
DIVISION OF ENVIRONMENTAL HEALTH SERVICES

www.sbcounty.gov/dehs

PRIVATE SEWAGE DISPOSAL SYSTEM CERTIFICATION

Applicant shall complete top 3 lines only. Certification shall be completed, on both sides, by a licensed contractor (A ,B, or C-42) or other qualified professional (R.P.E., C.E.G., R.E.H.S., etc.) Use n/a where necessary. For information, please call 909-387-4666.

Property Owner: SKY PARK, SANTA'S VILLAGE	Applicant Name:
Property Address: 28950 HWY 18	APN: 0332-211-02, 0332-212-02
Type of Project (Specify) TR, PM, CUP, DR, LUR, etc:	File Index Number:

Number of Units	Garbage Disposal Y ☐ N ☒	Tank Last Pumped (mo. / yr.) 6/14
Bedrooms 0	Vacant Y ☒ N ☐ How Long (yrs.) N/A	Tank Age (yrs.) N/A
Bathrooms 0	Basement Y ☐ N ☒	Disposal Area Age (yrs.) N/A

Commercial Development	Type of Fixtures (per UPC) *Indicate type and number of each* UPPER RETAIL BUILDING	
	Total Number of Fixture Units ☒ 4	Grease Interceptor ☐ Clarifier ☐ None ☒

Type of Septic Tank (Specify) CEMENT		Dimensions (L x W x D) (ft.) 8'x5'x5'
Type of Cover (Specify) DIRT	Tank Capacity (Gallons) 750	No. of Compartments 2
Specify Any Damage or Defects Observed: HOLE		

Type of Disposal Area Seepage Pit ☐ Leachlines ☒ Other ☐ (Specify)		
Distance From Well N/A ft.	Distance from Foundation N/A ft.	Distance from Nearest Lot Line ☐ Front ☐ Side ☐ Rear
Specify Any Damage or Defects Observed:		

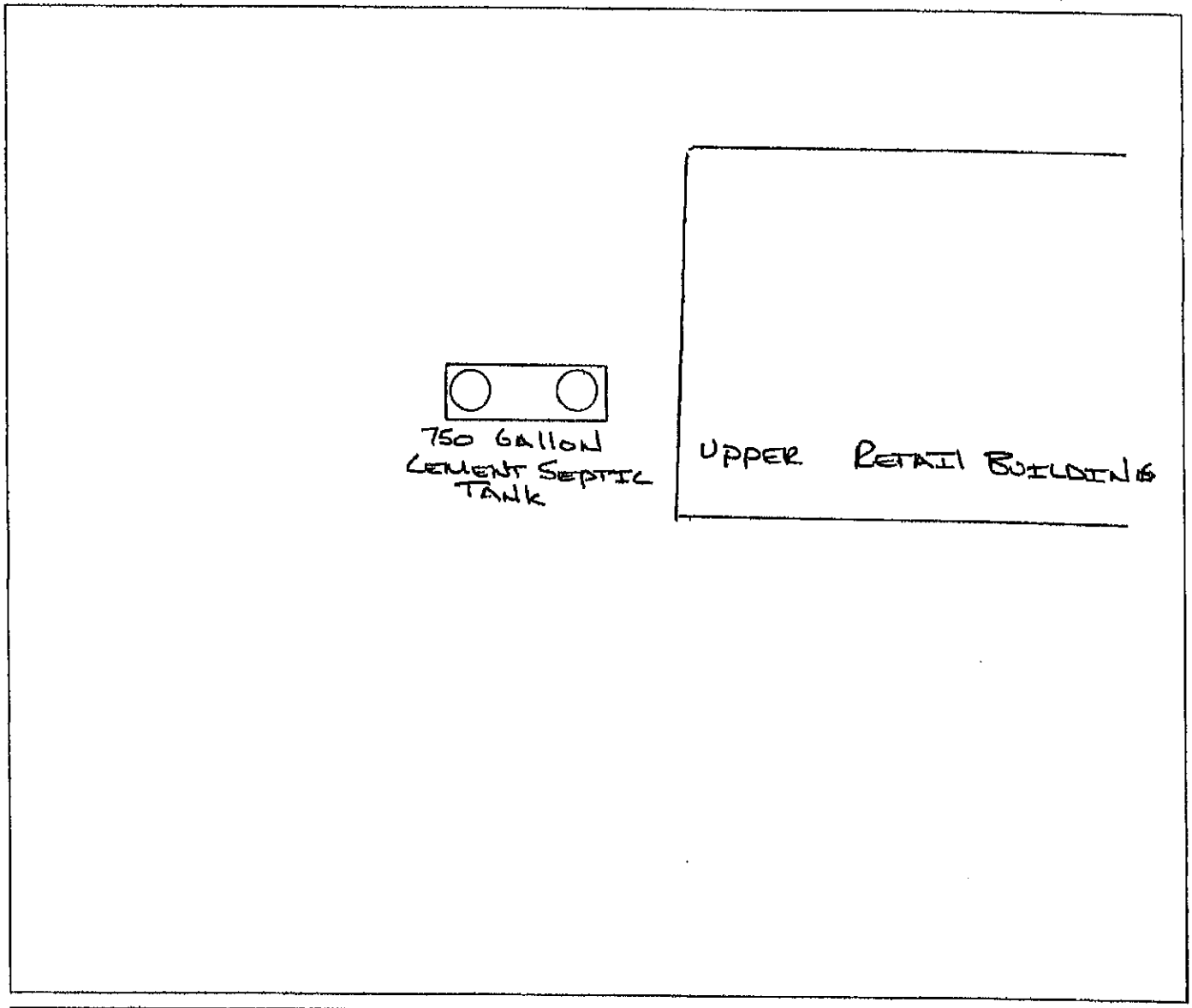
Seepage Pits	Number of Pits	Outside Diameter (ft.)	Depth (ft.)
	Depth of Pit Below Inlet (ft.)	Lining Material (Specify)	

Leachlines N/A	Number of Lines	Trench Width (in.)	Average Length of Lines (ft.)
	Total Absorption Area (sq. ft.) *Bottom of Trenches*		Depth (in.) *Finish Grade to Top of Line*
	Distance Between Lines (ft.)	Type of Filter Material Beneath Line (in.)	
	Depth of Material Above Line (in.)	Depth of Material Beneath Line (in.)	

Specify Indications of Previous System Failures (Odors, Seepage, etc.): *Use Additional paper if necessary*		
Dye Test Y ☐ N ☒	Hydraulic Test Y ☒ N ☐	NOTE: Attach test results and copies of building permits.

Tank & Disposal Area Information

In the space provided, show the location of the septic tank and disposal area in relation to the buildings and other landmarks (i.e. wells, trees, shrubs, driveways, parking, paving, drainage courses, property lines).



It is the opinion of the certifier that this sewage disposal system, ☐ Meets current code, ☒ Can be expected to function satisfactorily and is not likely to create any unsanitary conditions. OR ☐ Cannot be expected to function satisfactorily.

Date:	Signature:	Type of License:	Reg. Number:	Expiration:
7-24-14		C-42	363126	7/16

Name of Certifier:	Address:
SEAN BENNETT	P.O Box 1520, 92325

For DEHS Use Only

Reviewed By:	Date:
☐ Approved	☐ Not Approved - Reason

Appendix K: Drawings and Specifications

USDA

DRAWINGS AND SPECIFICATIONS

ENGINEERING DOCKET

SKYPARK SANTA'S VILLAGE LLC

Lined Waterway or Outlet

Water & Sediment Control Basin

Job Code: 468, 638
Farm No. : 1113
Tract No. : 18064
Engineering Class: V, II

Prepared by:
Haejin Lee
Area 4 Team Engineer
Oxnard Service Center
Ventura County

October 2015

CALIFORNIA

NATURAL RESOURCES CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
REDLANDS, CALIFORNIA

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UTILITY CHECK SHEET

ENGINEER'S COST ESTIMATE

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PRACTICE REQUIREMENTS

CONSTRUCTION DRAWINGS

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

Date: October 27, 2015

ENGINEERING JOB CLASSIFICATION

No.	Practice	Limiting Factor	(Units)	Job Class
468	Lined Waterway or Outlet	1. Drainage Area 2. Capacity	89.5 (acre) 59 (cfs)	V

Prepared by : Haejin Lee Date: 10/27/2015

Approved by: Date: 10/29/ 2015
Area Engineer

No.	Practice	Limiting Factor	(Units)	Job Class
638	Water & Sediment Control Basin	1. Storage 2. Height of fill	0.33 (ac-ft) 0 ft	II

Approved by: ___Haejin Lee_____ Date: _10/27/2015_
Team Engineer

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

LINED WATERWAY OR OUTLET

(Ft.)

CODE 468

DEFINITION

A waterway or outlet having an erosion-resistant lining of concrete, stone, synthetic turf reinforcement fabrics, or other permanent material.

PURPOSE

This practice may be applied as part of a resource management system to support one or more of the following purposes:

- Provide for safe conveyance of runoff from conservation structures or other water concentrations without causing erosion or flooding
- Stabilize existing and prevent future gully erosion
- Protect and improve water quality

CONDITIONS WHERE PRACTICE APPLIES

This practice applies if the following or similar conditions exist:

1. Concentrated runoff, steep grades, wetness, prolonged base flow, seepage, or piping is such that a lining is needed to control erosion
2. Use by people or animals precludes vegetation as suitable cover.
3. Limited space is available for design width, which requires higher velocities and lining.
4. Soils are highly erosive or other soil or climatic conditions preclude using vegetation only.

CRITERIA

General Criteria Applicable to All Purposes:

Capacity. The maximum capacity of the waterway flowing at designed depth shall not exceed 200 ft^3/s. The minimum capacity shall be adequate to carry the peak rate of runoff from a 10-year, 24-hour frequency storm. Velocity shall be computed by using Manning's Formula with a coefficient of roughness "n" as follows:

Lining	"n" Value
Concrete	
Trowel finish	0.011– 0.015
Float finish	0.013 - 0.016
Shotcrete	0.016 – 0.025
Flagstone	0.020 – 0.025
1/ Riprap - (Angular Rock)	$n = 0.047(D_{50}\,S)^{0.147}$
Synthetic Turf Reinforcement Fabrics and Grid Pavers	Manufacturer's recommendations

1/ Applies on slopes between 2 and 40% with a rock mantle thickness of 2 x D_{50}

where:

D_{50} = median rock diameter (in.),
S = lined section slope (ft./ft.) ($.02 \leq S \leq 0.4$)

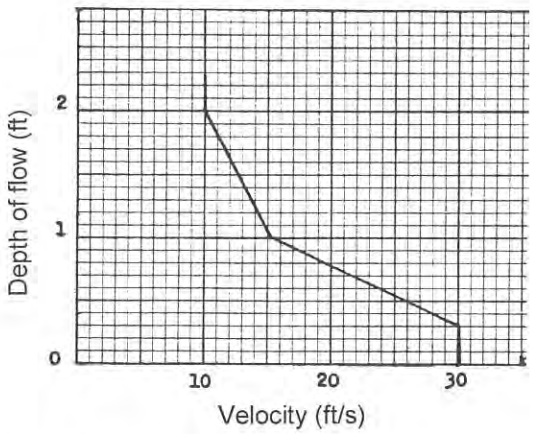

Figure 2. Maximum velocity versus depth of flow for concrete-lined channels

Velocity. Maximum design velocity and rock gradation limits for rock riprap-lined channel sections shall be determined using National Engineering Handbook (NEH), Part 650, Engineering Field Handbook, Chapter 16, Appendix 16A, or NEH 654.14C, unless a detailed design analysis appropriate to the specific slope, flow depth and hydraulic conditions indicate that a higher velocity is acceptable.

Maximum design velocity for concrete-lined sections should not exceed those using Figure 2.

Maximum design velocity for synthetic turf reinforcement fabrics and grid pavers shall not exceed manufacturer's recommendations.

Stable rock sizes and flow depths for rock-lined channels having gradients between 2 percent and 40 percent may be determined using the following detailed design process. This design process is from **Design of Rock Chutes** by Robinson, Rice, and Kadavy.

For channel slopes between 2% and 10%:

$$D_{50} = [q\,(S)^{1.5}/4.75(10)^{-3}]^{0.53}$$

For channel slopes between 10% and 40%:

$$D_{50} = [q\,(S)^{0.58}/3.93(10)^{-2}]^{0.53}$$

$$z = [n(q)/1.486(S)^{0.50}]^{0.6}$$

where:

D_{50} = Particle size for which 50% (by weight) of the sample is finer, in.

S = Bed slope, ft./ft.

z = Flow depth, ft.

n=Manning's roughness coefficient

q = Unit discharge, $ft^3/s/ft$

Avoid channel slopes between 0.7 and 1.3 of the critical slope except for short transition sections. Supercritical flow shall be restricted to straight reaches. Design guidance on the use of this equation is available in NEH 654.14C

Waterways or outlets with supercritical flow shall discharge into an energy dissipator to reduce discharge velocity to less than critical.

Side slope. The steepest permissible side slopes, horizontal to vertical, shall be:

Nonreinforced concrete:
- Hand-placed, formed concrete
  - Height of lining, 1.5 ft or less .....Vertical
- Hand-placed screeded concrete or mortared in place flagstone
  - Height of lining, less that 2 ft .....1 to 1
  - Height of lining, more than 2 ft .....2 to 1

Slip form concrete:
- Height of lining, less than 3 ft .....1 to 1

Rock riprap .....2 to 1
Synthetic Turf Reinforcement Fabrics ...2 to 1
Grid Pavers.....1 to 1

Cross section. The cross section shall be triangular, parabolic, or trapezoidal. Cross section made of monolithic concrete may be rectangular.

Freeboard. The minimum freeboard for lined waterways or outlets shall be 0.25 ft above design high water in areas where erosion-resistant vegetation cannot be grown adjacent to the paved or reinforced side slopes. No freeboard is required if vegetation can be grown and maintained.

Lining thickness. Minimum lining thickness shall be:

Concrete.....4 in. (minimum thickness shall be 5 in. if the liner is reinforced).

Rock riprap.....Maximum stone size plus thickness of filter or bedding

Flagstone.....4 in., including mortar bed

Synthetic Turf
Reinforcement Fabrics
and Grid Pavers..... Manufacturer's
Recommendations

Lining Durability. Use of non-reinforced concrete or mortared flagstone linings shall be made only on low shrink-swell soils that are well drained or where subgrade drainage facilities are installed.

Related structures. Side inlets, drop structures, and energy dissipators shall meet the hydraulic and structural requirements for the site.

Outlets. All lined waterways and outlets shall have a stable outlet with adequate capacity to prevent erosion and flooding damages.

Geotextiles. Geotextiles shall be used where appropriate as a separator between rock, flagstone, or concrete linings and soil to prevent migration of soil particles from the subgrade, through the lining material. Geotextiles shall be designed according to AASHTO M288, Section 7.3., NEH 654.14D,or NRCS Design Note 24, Guide for the Use of Geotextiles.

Filters or bedding. Filters or bedding shall be used where appropriate to prevent piping. Drains shall be used to reduce uplift pressure and to collect water, as required. Filters, bedding, and drains shall be designed according to NEH Part 633, Chapter 26. Weep holes may be used with drains if needed.

Concrete. Concrete used for lining shall be proportioned so that it is plastic enough for thorough consolidation and stiff enough to stay in place on side slopes. A dense durable product shall be required. Specify a mix that can be certified as suitable to produce a minimum strength of 3,000 pounds per square inch.

Contraction joints. Contraction joints in concrete linings, if required, shall be formed transversely to a depth of about one-third the thickness of the lining at a uniform spacing in the range of 8 to 15 feet. Provide steel reinforcement or other uniform support to the joint to prevent unequal settlement.

Site and Subgrade Preparation. Proper site preparation is necessary to provide a stable, uniform foundation for the waterway lining. The site should be graded to remove any rutting or uneven surfaces and to provide good surface drainage throughout the construction period and the design life of the waterway or outlet. Proof rolling can be used to identify soft pockets of soil, additional rutting, or other soil conditions that require removal, and replacement by compacted soil to provide a uniform surface for base, subbase, or concrete liner.

CONSIDERATIONS

Streambank Soil Bioengineering. Trees, shrubs, forbs and grasses can be incorporated into or adjacent to the lined portions of the channel. This may improve aesthetics and habitat benefits as well as reduce erosion potential. Plantings are especially beneficial where the channel transitions to natural ground. However, such plantings are not appropriate in all circumstances. Guidance on the use of plantings is available in NEH 654.14I and NEH 654.14K.

Fish and Wildlife Resources. This practice may impact important fish and wildlife habitats such as streams, creeks, riparian areas, floodplains, and wetlands.

Aquatic organism passage concerns (e.g., velocity, depth, slope, air entrainment, screening, etc.) should be evaluated to minimize negative impacts. Swimming and leaping performance for target species should be considered.

Important fish and wildlife habitat, such as woody cover or wetlands, should be avoided or protected if possible when siting the lined waterway. If trees and shrubs are incorporated, they should be retained or planted in the periphery of the grassed portion of the lined waterways so they do not interfere with hydraulic functions and roots do not damage the lined portion of the waterway. Mid- or tall bunch grasses and perennial forbs may also be planted along waterway margins to improve wildlife habitat.

Plant selections that benefit pollinators should be incorporated into the design. Waterways with these wildlife features are more beneficial when connecting other habitat types: e.g., riparian areas, wooded tracts, and wetlands.

Other Considerations.

Filter strips established on each side of the waterway may improve water quality.

Consideration should be given to livestock and vehicular crossings as necessary to prevent damage to the waterway. Crossing design shall not interfere with design flow capacity.

Reinforcement of concrete liners should be considered where high pore water pressures exist in the subgrade, movement of the subgrade may occur, or in reaches where failure would endanger public safety or property.

Cultural Resources and Endangered Species

This practice is likely to occur in areas where Cultural Resources or Endangered Species habitat may be found. Follow NRCS Planning Policy to address these concerns.

PLANS AND SPECIFICATIONS

Plans and specifications for lined waterways or outlets shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose(s).

As a minimum the plans and specifications shall include:

- A plan view of the layout of the lined waterway or outlet.
- Typical cross section of the lined waterway or outlet.
- Profile of the lined waterway or outlet.
- Disposal requirements for excess soil material.
- Site specific construction specifications that describe the installation of the lined waterway or outlet. Include specification for control of concentrated flow during construction.

OPERATION AND MAINTENANCE

An operation and maintenance plan shall be provided to and reviewed with the landowner. The plan shall include the following items and others as appropriate.

A maintenance program shall be established to maintain waterway capacity and outlet stability.

Lining damaged by machinery or erosion must be repaired promptly.

Inspect lined waterways regularly, especially following heavy rains. Damaged areas shall be repaired immediately. Remove sediment deposits to maintain capacity of lined waterways.

Landowners should be advised to avoid areas where forbs have been established when applying herbicides. Avoid using waterways as turn-rows during tillage and cultivation operations. Prescribed burning and mowing may be appropriate to enhance wildlife values, but must be conducted to avoid peak nesting seasons and reduced winter cover. Control noxious weeds. Do not use as a field road. Avoid crossing with heavy equipment.

REFERENCES

AASHTO M288. Standard Specification for Geotextile Specification for Highway Applications.

National Engineering Handbook, Part 654, Stream Restoration Design, August 2007.

National Engineering Handbook, Part 650, Engineering Field Handbook: Chapter 16, Streambank and Shoreline Protection.

National Engineering Handbook, Part 633, Soil Engineering: Chapter 26 – Gradation Design of Sand and Gravel Filers.

Robinson, K.M., C.E. Rice, and K.C. Kadavy. 1998. Design of Rock Chutes.Transactions of ASAE, Vol. 41(3): 621-626.

USDA, NRCS Guide for the Use of Geotextiles. Design Note 24 (210-VI-DN-24, 1991).

USDA, NRCS, Pollinator Conservation. http://www.plant-materials.nrcs.usda.gov/news/features/pollinatorconservation.html (accessed August 20, 2009.)

NATURAL RESOURCES CONSERVATION SERVICE

CONSERVATION PRACTICE STANDARD

WATER AND SEDIMENT CONTROL BASIN

(No.)

CODE 638

DEFINITION

An earth embankment or a combination ridge and channel constructed across the slope of minor watercourses to form a sediment trap and water detention basin with a stable outlet.

PURPOSE

This practice may be applied as part of a resource management system for one or more of the following purposes:

- To reduce watercourse and gully erosion
- To trap sediment
- To reduce and manage onsite and downstream runoff

CONDITIONS WHERE PRACTICE APPLIES

This practice applies to sites where:

1. The topography is generally irregular.
2. Watercourse or gully erosion is a problem.
3. Sheet and rill erosion is controlled by other conservation practices.
4. Runoff and sediment damages land and works of improvements.

Adequate outlets can be provided. Do not use this standard in place of terraces. Where the ridge and/or channel extends beyond the detention basin or level embankment, use Conservation Practice Standard (600), Terrace or (362) Diversion as appropriate.

CRITERIA

General Criteria Applicable to All Purposes

Install Water and Sediment Control Basins as part of a conservation system that adequately addresses resource concerns both above and below the basin. Where land ownership or physical conditions preclude treatment of the upper portion of a slope, a Water and Sediment Control Basin may be used to separate this area from, and permit treatment of the lower slope.

Location. Locate Water and Sediment Control Basins to control erosion in drainage ways. Basins may be installed singly or in series as part of system. Adjust the location to fit the topography, maximize storage and accommodate farm equipment and farming operations.

Earth embankment. Minimum top widths are given in Table 1. Construct embankments at least 5% greater than design height to allow for settlement. Measured from natural ground at the centerline of the embankment, the maximum settled height of the embankment must be 15 feet or less. The minimum width for vehicular traffic should be 12 feet.

Table 1. Minimum Top Width of Embankments

Fill Height (feet)	Top Width (feet)
0 – 5	3
5 - 10	6
10 –15	8

Design embankment slopes no steeper than 2 horizontal to 1 vertical. The sum of the horizontal components of the upstream and downstream slopes of the embankment must be 5 or greater. Design all slopes to be farmed no steeper than those on which farm equipment can be operated safely.

Foundation cutoff and seepage control.

Portions of basin ridges designed to impound more than a 3-foot depth of water must include foundation cutoff and if conditions warrant, seepage control. Refer to Conservation Practice Standard (378), Pond for criteria for foundation cutoff and seepage control.

Capacity. As a minimum, design Water and Sediment Control Basins with sufficient capacity to control the runoff from a 10-year frequency, 24-hour duration storm using a combination of flood storage and discharge through the outlet. Where basins are used for flood control or to protect other works of improvement, if warranted, use larger design storms appropriate to the risk.

In addition to the above storage, Water and Sediment Control Basins must have the capacity to store at least the anticipated 10-year sediment accumulation, or periodic sediment removal is required in the Operation and Maintenance Plan to maintain the required capacity.

Outlets. A Water and Sediment Control Basin must have an adequate outlet. The outlet must convey runoff water to a point where it will not cause damage. Outlets can be underground outlets, pipe drop structures, soil infiltration, stabilized channels or a combination of outlet types.

If the basin is cropped, design the outlet so that the flow release time does not exceed the inundation tolerance of the planned crops. If sediment retention is a primary design goal, adjust the release rate according to sediment particle size so that sediment is retained in the basin. Refer to Conservation Practice Standard (620), Underground Outlet for design criteria for underground outlets.

Outlets can include auxiliary spillways above the primary storage to handle large storm flows. If an auxiliary spillway is used, add freeboard to the design height of the embankment to provide for the safe operation of the spillway. The freeboard shall be at least 0.5 ft. above the design flow depth through the auxiliary spillway. Auxiliary spillways must not contribute runoff to lower Water and Sediment Control Basins unless they are designed to handle the runoff. Refer to Conservation Practice Standard (378), Pond for criteria to design auxiliary spillways.

Topsoil. Where necessary to restore or maintain productivity, spread topsoil over areas disturbed by construction. Topsoil can be salvaged and stockpiled from the site of the Water and Sediment Control Basin prior to construction.

Vegetation. After construction of the Water and Sediment Control Basin, revegetate disturbed areas that will not be cropped as soon as possible. In non-cropland settings other erosion protection such as gravel or organic mulches can also be used.

Refer to Conservation Practice Standard (342), Critical Area Planting for criteria on seed selection, seedbed preparation, fertilizing and seeding.

Additional Criteria for when the effective height exceeds 6 feet.

For effective heights greater than six feet, the water and sediment control basin shall be designed to meet the requirements of standard (378) Pond, (410) Grade Stabilization or TR-60 according to the class and type of structure.

CONSIDERATIONS

Water and Sediment Control Basins can be spaced at intervals down a slope, similar to terraces, in order to control erosion. Refer to Conservation Practice Standard (600), Terraces for methods to determine spacing. Additional conservation measures may be needed in the water course between basins to prevent erosion.

When choosing the location of a Water and Sediment Control Basin be sure to consider the extent of ponding that will occur from the basin. If the basin will cause water to pond near or across property lines both land owners should agree in writing on the elevation and expected duration of ponding.

The soil survey can be a valuable resource when planning and designing water and sediment control basins. The soil survey can identify potential problems such as the presence of limiting layers to plant growth in the soil profile. Field investigations can then identify problem areas to avoid such as shallow bedrock or dense, acid or saline layers that will adversely affect plant growth if construction brings them into the root zone.

Sediment retention within the basin can be enhanced by using flow deflectors, inlet and outlet selection, and by increasing the length to width ratio of the basin.

For cropped fields, embankment orientation and crop row direction should be approximately perpendicular to the land slope to support contour farming. The design should support farmability by limiting short point rows or sharp curves. Field boundaries and row lengths should also be considered in planning basin location and row direction.

Underground outlets from Water and Sediment Control Basins can provide a direct conduit to receiving waters for contaminated runoff from crop land. To reduce the impact of this runoff, Water and Sediment Control Basins should be installed as part of a conservation system that includes such practices as grassed waterways, contouring, a conservation cropping system, conservation tillage, nutrient and pest management, crop residue management and filter areas to reduce or mitigate contaminated runoff.

Seasonal water sources can be very important for migratory waterfowl and other wildlife. Partially blocking the outlet of a basin during non-cropping times of the year will allow water to pond in the basin to provide water for wildlife. Refer to Conservation Practice Standard (646) Shallow Water Development and Management for information on managing seasonal water sources for wildlife.

The construction of a Water and Sediment Control Basin can disturb large areas and potentially affect cultural resources. Be sure to follow state cultural resource protection policies before construction begins.

The construction of Water and Sediment Control Basins can introduce steep and potentially dangerous slopes into crop fields. When designing Water and Sediment Control Basins that will be farmed, choose flat slopes that will be safe for operating farm equipment. Where steep slopes are unavoidable, make sure that the farmer is aware of the location of the basin and the potential danger.

Cultural Resources

NRCS policy is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice or associated practices in the plan could have an effect on cultural resources. The National Historic Preservation Act may require consultation with the California State Historic Preservation Officer.

http://www.nrcs.usda.gov/technical/cultural.html is the primary website for cultural resources information. The California Environmental Handbook and the California Environmental Assessment Worksheet also provide guidance on how the NRCS must account for cultural resources. The e-Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

Endangered Species

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

PLANS AND SPECIFICATIONS

Prepare plans and specifications for Water and Sediment Control Basins that describe the requirements for applying the practice according to this standard. As a minimum the plans and specifications shall include:

1. A plan view of the layout of the Water and Sediment Control Basin system.
2. Typical cross sections of the basin(s).
3. Profile(s) of the basin(s).

4. Details of the outlet system.
5. For underground outlets, details of the inlet and profile(s) of the underground outlet.
6. Seeding requirements if needed.
7. Construction specifications that describe in writing site specific installation requirements of the Water and Sediment Control Basin system.

OPERATION AND MAINTENANCE

Prepare an operation and maintenance plan for the operator. The minimum requirements to be addressed in the operation and maintenance plan are:

1. Periodic inspections, especially immediately following significant runoff events.
2. Prompt repair or replacement of damaged components.
3. Maintenance of basin ridge height and outlet elevations.
4. Removal of sediment that has accumulated in the basin to maintain capacity and grade.
5. Regular cleaning of inlets for underground outlets. Repair or replacement of inlets damaged by farm equipment. Removal of sediment around inlets to ensure that the inlet remains the lowest spot in the basin.
6. Where vegetation is specified, regular mowing and control of trees and brush. Vegetative disturbance should be scheduled to avoid the peak nesting season.
7. Notification of hazards about steep slopes on the basin.

REFERENCES

USDA, NRCS. National Engineering Handbook, Part 650 Engineering Field Handbook, Chapters 6, 8, 14.

NOAA Atlas 14, Volume 6, Version 2
Location name: Skyforest, California, US*
Latitude: 34.2340°, Longitude: -117.1691°
Elevation: 5669 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.235 (0.195–0.286)	0.309 (0.256–0.376)	0.411 (0.339–0.502)	0.498 (0.408–0.614)	0.624 (0.494–0.795)	0.726 (0.563–0.946)	0.835 (0.632–1.12)	0.953 (0.701–1.31)	1.12 (0.793–1.61)	1.27 (0.861–1.88)
10-min	0.336 (0.279–0.410)	0.442 (0.366–0.539)	0.588 (0.486–0.719)	0.714 (0.585–0.880)	0.894 (0.708–1.14)	1.04 (0.807–1.36)	1.20 (0.906–1.60)	1.37 (1.01–1.88)	1.61 (1.14–2.31)	1.81 (1.24–2.69)
15-min	0.407 (0.337–0.495)	0.535 (0.443–0.652)	0.712 (0.588–0.870)	0.863 (0.707–1.06)	1.08 (0.857–1.38)	1.26 (0.976–1.64)	1.45 (1.10–1.93)	1.65 (1.22–2.27)	1.95 (1.37–2.79)	2.19 (1.49–3.25)
30-min	0.582 (0.483–0.709)	0.765 (0.634–0.933)	1.02 (0.841–1.25)	1.24 (1.01–1.52)	1.55 (1.23–1.97)	1.80 (1.40–2.35)	2.07 (1.57–2.77)	2.37 (1.74–3.25)	2.79 (1.97–3.99)	3.14 (2.14–4.65)
60-min	0.829 (0.687–1.01)	1.09 (0.903–1.33)	1.45 (1.20–1.77)	1.76 (1.44–2.17)	2.20 (1.75–2.81)	2.56 (1.99–3.34)	2.95 (2.23–3.94)	3.37 (2.48–4.62)	3.97 (2.80–5.68)	4.47 (3.04–6.62)
2-hr	1.21 (1.01–1.48)	1.59 (1.31–1.93)	2.10 (1.74–2.57)	2.55 (2.09–3.14)	3.19 (2.53–4.07)	3.71 (2.88–4.83)	4.27 (3.23–5.69)	4.87 (3.58–6.69)	5.74 (4.05–8.22)	6.46 (4.40–9.58)
3-hr	1.53 (1.27–1.87)	2.00 (1.66–2.44)	2.64 (2.18–3.23)	3.19 (2.62–3.94)	3.99 (3.16–5.08)	4.63 (3.59–6.03)	5.32 (4.02–7.10)	6.06 (4.46–8.33)	7.14 (5.03–10.2)	8.02 (5.47–11.9)
6-hr	2.26 (1.88–2.75)	2.95 (2.44–3.60)	3.89 (3.22–4.76)	4.70 (3.85–5.79)	5.84 (4.63–7.45)	6.77 (5.25–8.82)	7.75 (5.86–10.3)	8.81 (6.48–12.1)	10.3 (7.27–14.8)	11.5 (7.87–17.1)
12-hr	3.18 (2.64–3.88)	4.24 (3.52–5.17)	5.67 (4.69–6.93)	6.87 (5.63–8.46)	8.54 (6.76–10.9)	9.86 (7.65–12.8)	11.2 (8.51–15.0)	12.7 (9.35–17.4)	14.8 (10.4–21.1)	16.4 (11.2–24.3)
24-hr	4.59 (4.07–5.29)	6.30 (5.58–7.27)	8.58 (7.58–9.92)	10.5 (9.17–12.2)	13.1 (11.1–15.8)	15.1 (12.6–18.6)	17.3 (14.0–21.7)	19.5 (15.4–25.2)	22.6 (17.1–30.4)	25.0 (18.3–34.9)
2-day	6.06 (5.37–6.98)	8.46 (7.49–9.76)	11.7 (10.3–13.5)	14.4 (12.6–16.8)	18.2 (15.5–22.0)	21.3 (17.7–26.2)	24.5 (19.8–30.8)	27.8 (21.9–36.0)	32.6 (24.7–44.0)	36.4 (26.6–50.8)
3-day	6.77 (6.00–7.80)	9.52 (8.43–11.0)	13.3 (11.7–15.4)	16.5 (14.4–19.2)	21.0 (17.8–25.3)	24.7 (20.5–30.3)	28.6 (23.1–36.0)	32.7 (25.8–42.4)	38.6 (29.2–52.1)	43.4 (31.8–60.6)
4-day	7.35 (6.51–8.47)	10.4 (9.19–12.0)	14.5 (12.8–16.8)	18.1 (15.9–21.1)	23.2 (19.7–28.0)	27.4 (22.7–33.6)	31.8 (25.7–40.0)	36.5 (28.8–47.3)	43.3 (32.8–58.5)	48.9 (35.8–68.3)
7-day	8.46 (7.49–9.74)	11.9 (10.5–13.7)	16.7 (14.7–19.3)	20.8 (18.2–24.3)	26.8 (22.7–32.3)	31.8 (26.4–39.1)	37.1 (30.1–46.7)	42.9 (33.8–55.5)	51.3 (38.8–69.2)	58.3 (42.7–81.4)
10-day	9.13 (8.09–10.5)	12.8 (11.4–14.8)	18.0 (15.9–20.8)	22.5 (19.7–26.2)	29.1 (24.6–35.0)	34.5 (28.6–42.4)	40.3 (32.7–50.8)	46.8 (36.9–60.5)	56.1 (42.5–75.7)	64.0 (46.8–89.3)
20-day	10.9 (9.62–12.5)	15.4 (13.6–17.7)	21.7 (19.1–25.1)	27.1 (23.8–31.6)	35.1 (29.7–42.3)	41.7 (34.6–51.2)	48.8 (39.5–61.4)	56.6 (44.6–73.3)	68.0 (51.4–91.7)	77.6 (56.7–108)
30-day	12.7 (11.2–14.6)	18.0 (15.9–20.7)	25.4 (22.4–29.3)	31.7 (27.8–37.0)	40.9 (34.7–49.3)	48.5 (40.2–59.6)	56.6 (45.9–71.3)	65.5 (51.6–84.8)	78.5 (59.4–106)	89.3 (65.3–125)
45-day	15.2 (13.4–17.5)	21.4 (18.9–24.7)	30.0 (26.5–34.7)	37.3 (32.7–43.5)	47.8 (40.5–57.6)	56.3 (46.7–69.2)	65.4 (53.0–82.4)	75.3 (59.4–97.5)	89.6 (67.8–121)	101 (74.2–142)
60-day	17.8 (15.7–20.4)	24.8 (21.9–28.6)	34.4 (30.3–39.7)	42.5 (37.2–49.5)	54.0 (45.7–65.0)	63.2 (52.5–77.8)	73.0 (59.2–92.0)	83.6 (65.9–108)	98.8 (74.7–133)	111 (81.4–155)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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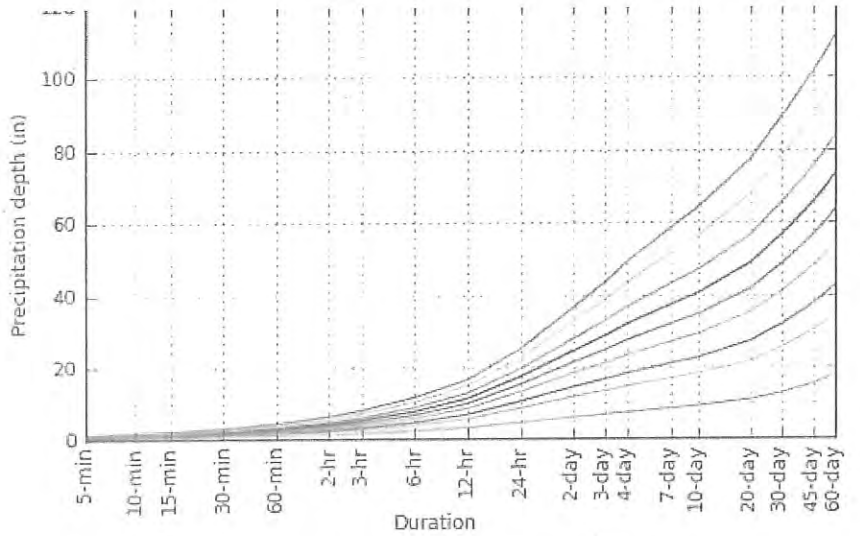
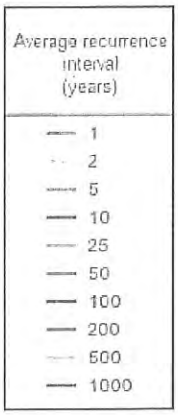
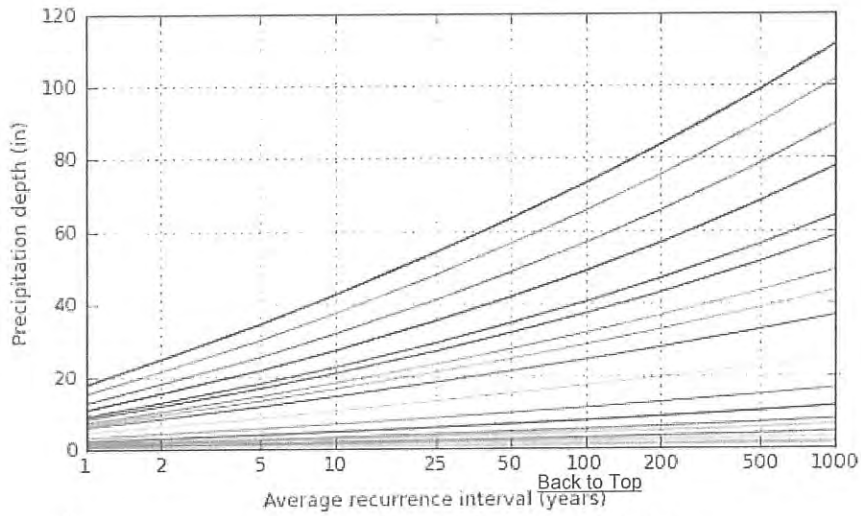
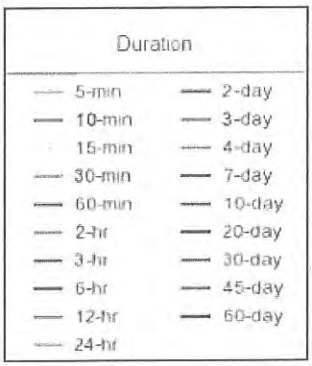
PF graphical









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Maps & aerials

NOAA Atlas 14, Volume 6, Version 2

Created (GMT): Wed Oct 7 23:19:20 2015

Small scale terrain

Large scale terrain

Large scale map

Large scale aerial

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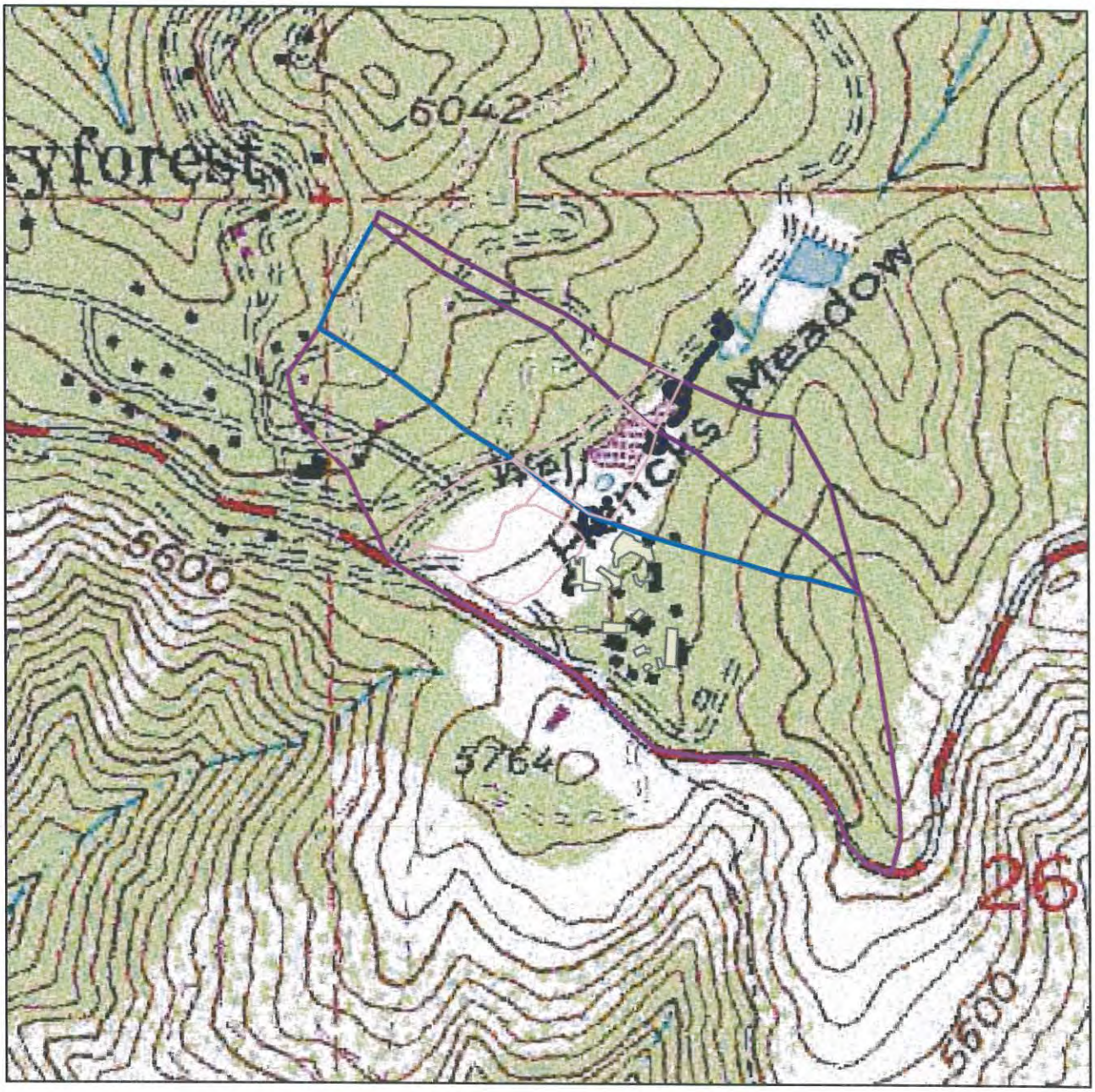
US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
Office of Hydrologic Development
1325 East West Highway
Silver Spring, MD 20910

Questions?: HDSC.Questions@noaa.gov

Disclaimer

Soil Map

Topo Map



NRCS-CA-ENG-6
Rev February 1999

US Department of Agriculture
Natural Resources Conservation Service

UTILITY CHECK SHEET

Farm Name/Owner: Skypark Santa's Village LLC._____

Project: ____Lined Waterway and Water & Sediment Control Basin_____

Location: _____

Utilities Involved and Location: __Gas line and Water line _____

It shall be the responsibility of the landowner to notify the Contractor or persons doing the above stated construction of the presence of utilities on the site and to see that the Utility Companies are notified.

Land Owner or Operator Notified: _____ By Whom: __Haejin Lee_____
(Contact Name)

How Notified: _____ Date: __ _/2015__

Work to be Done: ___Replace as needed_____ When: ___during construction__

Utility Company Notified: _____ By Whom: _____
(Contact Name)

How notified: _____ Date: ____/____/____

Request to locate utility: _____
(Utilities to be located and marked on site by utility company)

Utilities to be relocated: _____
(Work to be done)

Utilities to be relocated by: _____ When: _____

Request utility company representative be present on site during construction: _____

Response: _____

Contractor Notified: _____ By whom: _____
(Contact Name)

How: _____ Date: ____/____/____

Type of Utility: _____ Location: _____

Location in relation to work -- Vertical: _____ Horizontal: _____

Contractor shown utility location markings and/or stakes: _____

Utility location shown on drawings: _____

Remarks: Landowner/Contractor shall notify Dig Alert (800 - 227 – 2600 or 811) at least two working days prior to Construction.

Prepared by: ___Haejin Lee_____ **Accepted by**: _____
(Signature) (Landowner Signature)

ENGINEERING COST ESTIMATE:

Skypark Santa's Village LLC

by Haejin Lee

Date: 10/27 /2015

Lined Waterway (468)

Water & Sediment Control Basin (638)

Item No.	Description of Work	Spec. No.	Estimated Quantity	Unit	Unit Price	Amount
1	Mobilization		1.0	EA	$3,000.00	$3,000.00
2	Earthwork (Cut)_Sediment Basin	903	1,883.0	CY	$15.00	$28,245.00
3	Earthwork (Cut)_Lined Waterway	903	751.0	CY	$15.00	$11,265.00
4	Rock Lined Waterway_South (D_{100}=12")	907	220.0	CY	$80.00	$17,600.00
5	Rock Lined Waterway_Middle (D_{100}=18")	907	55.0	CY	$100.00	$5,500.00
6	Rock Lined Waterway_North (D_{100}=24")	907	86.0	CY	$120.00	$10,320.00
7	Geotextile Fabric	905	1,500.0	SY	$3.00	$4,500.00
8	Labor for installation of rock & fabric			EA		
					Total	$80,430.00

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

468 – LINED WATERWAY OR OUTLET

OPERATION AND MAINTENANCE

Sponsor/Land user: Skypark Santa's Village LLC Date: 10 /2015

Address: Somis, CA

Location GPS Coordinates Map Datum: _____ E _____ N _____

Quad Sheet Name _____ SEC _____ T _____ R _____

A properly operated and maintained lined waterway or outlet is an asset to the farm. This lining facility was designed and installed to provide erosion protection for the waterway or outlet. The estimated life span of this installation is at least 15 years. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation to maintain satisfactory performance. Here are some recommendations to help you develop a good operation and maintenance program:

GENERAL RECOMMENDATIONS

- Maintain adequate drainage of foundations.
- Maintain widths of soil berms or banks. Avoid use of tillage equipment that accelerates soil removal.
- Drain all lined waterways or outlets when not being used. Immediately repair any cracks or breaks in the lining, and if settlement is present, investigate cause before repair.
- If livestock are present, prevent their access to linings and provide other drinking water facilities.
- Remove any blockage (sediments, debris, foreign material etc.) that restrict flow capacity.
- Immediately repair any vandalism, vehicular or livestock damage.
- Inspect for damage from rodents or burrowing animals. Repair any damage. Take appropriate corrective actions to alleviate further damage.
- Remove woody vegetation and perennials from areas adjacent to lining,
- Repair spalls, cracks and weathered areas in concrete surfaces.
- Repair or replace rusted or damaged metal and paint and apply paint as a protective coating.
- Avoid crossings of equipment or vehicles except at designated areas.

SPECIFIC RECOMMENDATIONS FOR YOUR LINED WATERWAY OR OUTLET

CONTACT YOUR LOCAL NATURAL RESOURCES CONSERVATION SERVICE OFFICE FOR ANY ADDITIONAL TECHNICAL ASSISTANCE YOU MIGHT NEED FOR IMPLEMENTATION OF THIS OPERATION AND MAINTENANCE PLAN FOR YOUR LINED WATERWAY OR OUTLET.

UNITED STATES DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE

638 – WATER AND SEDIMENT CONTROL BASIN

OPERATION AND MAINTENANCE

Sponsor/Land user: **Skypark Santa's Village LLC** Date: **10/2015**

Address: _____

_____

Location GPS Coordinates Map Datum: _____ E _____ N _____

Quad Sheet Name _____ SEC _____ T _____ R _____

A properly operated and maintained Water and Sediment Control Basin is an asset to your farm. This sediment basin was designed and installed to remove, collect and provide temporary storage of sediment and water. The estimated life span of this installation is at least 10 years. The life of this installation can be assured and usually increased by developing and carrying out a good operation and maintenance program.

This practice will require you to perform periodic operation to maintain satisfactory performance. Additional permits may be required to perform this work. Here are some recommendations to help you develop a good operation and maintenance program.

GENERAL RECOMMENDATIONS

- Periodic removal of sediment is necessary to maintain the effectiveness of this installation. The cleanout intervals may vary depending upon the volume of sediment that has accumulated. As a general rule the basin will lose its effectiveness when about 50 percent of the design volume is filled with sediment.
- Periodically inspect the spillways and control gates for proper functioning for their ability to maintain the water level to design elevations. Immediately remove any blockage or obstructions in spillways.
- Maintain vigorous growth of vegetative coverings. This includes reseeding, fertilization, and application of herbicides when necessary. Periodic mowing may also be needed to control height.
- If fences are installed, they shall be maintained to prevent unauthorized or livestock entry.
- Immediately repair any vandalism, vehicular, or livestock damage to any earthfills, spillways, outlets or other appurtenance.
- Removal of debris that may accumulate at the pond and immediately upstream or downstream from the basin.
- Make sure all structure drains are functional and soil is not being transported through the drainage system. The screens and/or rodent guards shall also be kept in place.

- Repair spells, cracks and weathered areas in concrete surfaces.
- Repair or replace rusted or damaged metal and apply paint as a protective coating.
- Inspect for damage from rodents or burrowing animals. Repair any damage. Take appropriate corrective actions to alleviate further damage.
- Remove woody vegetation from embankments.
- Avoid excessive travel on any portion of the system that will harm or destroy the vegetative cover.

SPECIFIC RECOMMENDATIONS FOR WATER AND SEDIMENT CONTROL BASIN

CONTACT YOUR LOCAL NATURAL RESOURCES CONSERVATION SERVICE OFFICE FOR ANY ADDITIONAL TECHNICAL ASSISTANCE YOU MIGHT NEED FOR IMPLEMENTATION OF THIS OPERATION AND MAINTENANCE FOR YOUR WATER AND SEDIMENT CONTROL BASIN.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PRACTICE SPECIFICATION

468 - LINED WATERWAY OR OUTLET

I. SCOPE

The work shall consist of grading and shaping a waterway to the lines and grades as shown on the drawings, and includes furnishing and placing a lining of the type and thickness as specified.

II. MATERIALS

Concrete, when specified, will be placed in conformance with the requirements of Construction Specification 900 – Concrete (3000 psi).

Rock riprap, when specified, rock will be placed in conformance with the requirements of Construction Specification 907 - Rock Riprap.

Other materials, when specified other materials will be placed in conformance with the requirements of Special Construction Specifications to be attached to the drawings.

Geotextile fabric, when specified will conform to the required of Construction Specification 905 - Geotextile Fabric.

III. SITE PREPARATION

The foundation area shall be cleared of all trees, stumps, roots, brush, boulders, sod, debris, and other objectionable materials. All topsoil shall be removed and stockpiled until the needed for spreading over areas requiring vegetative cover. Removal operations shall be done in such a manner as to avoid damage to other trees and property.

IV. FOUNDATION

To shape the required cross-section, excavation shall be to the lines and grades as shown on the drawings, or as staked in the field. Subgrade shall be firm and free of water. Any earthfill required to bring subgrade to grade, shall be placed in layers not exceeding 8-inches, and compacted to the same density as the adjacent undisturbed material.

V. PLACEMENT

Placement of the lining materials shall be conformance of the Construction Specification as shown on the Practice Requirement sheet, and as shown on the drawings.

VI. VEGETATIVE COVER

Unless otherwise specified, a protective cover of vegetation shall be established on the disturbed area. The planting of vegetative materials shall conform to the requirements of Practice Specification 342, Critical Area Planting.

VII. SPECIAL MEASURES

Measures and construction methods shall be incorporated as needed and practical, that enhance fish and wildlife values. Special attention shall be given to protecting visual resources and maintaining key shade, food and den trees.

VIII. CONSTRUCTION OPERATIONS

Construction operations shall be done in such a manner that erosion and air and water pollution are minimized and held within legal limits. The owner, operator, Contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regards to the safety of all persons and property.

The completed job shall be workmanlike and present a good appearance.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION CONSTRUCTION SPECIFICATION

903 – EARTHFILL

I. SCOPE

The work shall consist of borrow excavation, hauling, placing and compacting earthfills required to construct the earthfills as shown on the drawings, or as staked in the field.

II. SUBGRADE PREPARATION

Subgrades for earthfill shall be stripped to remove vegetation and other unsuitable materials. The subgrade surfaces shall be graded to remove surface irregularities and shall be scarified parallel to the axis of the fill and loosened to a minimum depth of 2 inches. The moisture content of the loosened material shall be controlled as specified for the earthfill, and the surface materials of the subgrade shall be compacted and bonded with the first layer of earthfill.

Earth abutment surfaces shall be free of loose, uncompacted earth in excess of two inches in depth normal to the slope and shall be at such a moisture content that the earthfill can be compacted against them to ensure a good bond between the fill and the abutments. Subgrade and abutment surfaces shall not steeper than 1 horizontal to 1 vertical.

The sites of the borrow area shall be stripped to sufficient depth to remove all vegetation, roots, brush, sod and other objectionable material. Clearing and disposal methods shall be in accordance with applicable state and county laws with due regards to the safety of persons and property.

III. EXCAVATION

Excavated Material

To the extent they are needed, all suitable materials from the specified excavations shall be used in the construction of required permanent earthfill. The suitability of materials for specific purposes will be determined by an Engineer.

All surplus or unsuitable excavated materials will be designated as waste and shall be disposed of at the locations shown on the drawings or at sites remote from the project.

Borrow Excavation

When the quantities of suitable materials obtained from specified excavations are insufficient to construct the specified fills, additional materials shall be obtained from the designated borrow areas. The extent and depth of borrow pits within the limits of the designated borrow areas shall be as shown on the drawings.

Borrow pits shall be excavated and finally dressed in manner to eliminate steep or unstable side slopes or other hazardous or unsightly conditions, and shall be free draining of any water ponding.

Bracing and Shoring

Excavated surfaces too steep to be safe and stable if unsupported shall be supported as necessary to safeguard the work and workmen, to prevent sliding or settling of the adjacent ground, and to avoid damaging existing improvements. The width of the excavation shall be increased if necessary to provide space for sheeting, bracing, shoring, and other supporting installations.

Structure or Trench Excavation

Structure or trenched excavation shall be completed to the specified elevations and to sufficient length and width to include allowance for forms, bracing and supports, as necessary, before any concrete or earthfill is placed or any piles are driven within the limits of the excavation.

IV. PLACEMENT

Material

All material shall be obtained from selected areas as shown on the drawings. Fill materials shall contain no sod, brush, roots, or other perishable or unsuitable material. Cobbles and rock fragments over 3 inches in diameter shall be removed from the material prior to compaction and be disposed of or placed in areas designated.

Fill shall not be placed until the required excavation and subgrade preparation has been completed. Fill shall not be placed upon a frozen surface, nor shall snow, ice, or frozen material be incorporated in the fill.

Fill shall be placed in approximately horizontal layers. The thickness of each layer before compaction shall not exceed 8-inches. Materials placed by dumping in piles or windows shall be spread uniformly to not more than the specified thickness before being compacted. If the surface of any layer becomes too hard and smooth for proper bond with the succeeding layer, it shall be scarified parallel to the axis of the fill to a depth of not less than 2 inches before the next layer is placed.

Fill placed around structures will be brought up at approximately uniform height on all sides of the structure.

The distribution and gradation of materials throughout the fill shall have no lenses, pockets, streaks, or layers of material differing substantially in texture or gradation from the surrounding material. If zoned fills of substantially differing materials are specified; the zones shall be placed according to lines and grades shown on the drawings.

V. CONTROL OF MOISTURE CONTENT

During placement and compaction of fill, the moisture content of the materials being placed shall be moist so the material will maintain a ball shape when squeezed in the hand. When specified, the moisture shall be maintained within 2 percentage points of optimum as determined by ASTM D-698, and as specified on the "Practice Requirements" sheet.

The application of water to the fill materials shall be accomplished at the borrow areas insofar as practicable. Uniform moisture distribution shall be obtained by disking. Material that is too wet when deposited on the fill shall either be removed or be dried to the desired moisture content prior to compaction.

If the top surface of the preceding layer of compacted fill or a subgrade or abutment surface in the zone of contact with the fill becomes too dry to permit suitable bond, it shall either be removed or scarified and moistened to an acceptable moisture content prior to placement of the next layer of fill.

The proper moisture content for compaction will be determined by inspection during the placement operation.

VI. COMPACTION

Construction equipment shall be operated over each layer of fill to ensure that the required compaction is obtained. Special equipment shall be used if needed to obtain the required compaction. Compaction shall meet the requirements of the method specified on the "Practice Requirements" sheet and as described below:

1. Sheepsfoot roller - The roller shall have staggered, uniform spaced tamping feet and be equipped with suitable cleaners. The weight of the roller shall not be less than 2,500 pounds per foot of width. The maximum speed shall be less than 3 miles per hour. The entire surface of each layer placed shall receive 4 passes of this equipment.
2. Pneumatically tired equipment. A loaded scraper shall be considered a pneumatic roller. The entire surface of each layer shall receive 6 passes of this equipment.
3. Track Laying Equipment (bulldozer). The entire surface of each layer shall receive 8 passes of this equipment.
4. Compaction shall result in densities equal to or greater than 95 percent of the maximum obtained by laboratory compaction at optimum moisture of like soils in accordance with the procedures given in ASTM D-698, Method A.
5. Compaction shall result in densities equal to or greater than 90 percent of the maximum obtained by laboratory compaction at optimum moisture of like soils in accordance with the procedure given ASTM D-1557, Method A.

Heavy compaction equipment shall not be operated within 2 feet of any structure. The passage of heavy equipment will not be allowed:

(1) Over cast-in-place conduits within 14-days after placement of the concrete
(2) Over cradled or bedded precast conduits within 7 days after placement of the concrete cradle or bedding
(3) Over any type of conduit until the backfill has been placed above the top surface of the structure to a height equal to one-half the clear span width of the structure or pipe or 2 feet, whichever is greater, except as may be specified in the "Practice Requirements sheet

Fill adjacent to structures, pipe, conduits, and anti-seep collars shall be compacted to a density equivalent to that of the surrounding fill by means of hand tampers or plate vibrators. Hand directed tampers or compactors shall be used on areas not accessible to heavy compaction equipment, fills compacted in this manner shall be placed in layers not greater than 4 inches in thickness before compaction, and shall meet the same density requirement as for the adjacent area.

Compaction of backfill adjacent to structures shall not be started until after the expiration of the following minimum time interval after placement of the concrete:

Counterforts, vertical or near-vertical walls with earth loading on one side only	14 days
Walls and counterforts, backfilled on both sides simultaneously	7 days
Anti-seep, collars, conduits, and cantilever outlet bents	3 days

VII. TESTING

During the course of the work, tests may be made to identify materials, to determine compaction characteristics, to determine moisture content, and to determine density of fill in place. These test results will be used to verify that the fills conform to the requirements of the specifications. Such tests are not intended to provide information required for the proper execution of the work and shall not relieve the landowner or their contractor of the necessity to perform tests for quality control.

Fill not meeting the specified requirements shall be reworked or removed and replaced with acceptable fill.

VIII. FINISH

After the placement of the earthfills, and spoils the sides and top shall be dressed by final passage of compaction equipment or by dragging to give a smooth surface. The surface area shall be graded to provide surface drainage to flow to desired locations.

IX. VEGETATIVE COVER

Unless otherwise specified, on the "Practice Requirements" sheet, a protective cover of vegetation shall be established on all disturbed areas. The planting of vegetative materials shall conform to the requirements of Practice Specification 342, Critical Area Planting.

X. SPECIAL MEASURES

Measures and construction methods shall be incorporated as needed and practical that enhances fish and wildlife values. Special attention shall be given to protecting visual resources and maintaining key shade, food, and den trees.

XI. CONSTRUCTION OPERATIONS

Construction operations shall be done in such a manner that erosion and air and water pollution are minimized and held within legal limits. The owner, operator, contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regards to the safety of all persons and property.

The completed job shall be workmanlike and present a good appearance.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION CONSTRUCTION SPECIFICATION

905 - GEOTEXTILE FABRIC

I. SCOPE

The work shall consist of furnishing and installing geotextile fabric at the locations shown on the drawings.

II. MATERIALS

Geotextile fabrics shall consist of commercial grade of woven or nonwoven synthetic polymeric filament fibers that are formed into a stable network. They shall be resistant to soil chemicals, mildew, rodents and insects. Fibers shall contain stabilizers and/or inhibitors to enhance resistance to ultraviolet light. Fabrics are classified according to the following types:

1a - Woven Monofilament

1a - Non-Woven Bonded

2a - Non-Woven Needle punched

The type of fabric required and the specific physical properties shall be as indicated on the "Practice Requirements" sheet.

The physical properties of the fabric shall conform to the requirements listed in Table 1, for Woven Geotextiles and Table 2 for Non-woven geotextiles. The fabric shall be protected from deterioration by ultraviolet light.

Securing Pins used to secure the filter fabric in place shall be steel or fiberglass. Each pin shall be formed as an "U", "L", or "T" shapes or contain "ears" to prevent total penetration. Grommets or steel washers with an outside diameter of 1½ inches shall be provided for all but "U" shaped securing pins.

III. Installation

The surface on which the geotextile is to be placed shall be graded to the neat lines and grades as shown on the drawings. The surface shall be reasonably smooth and free of loose rock and clods, holes, depressions, projections, muddy conditions and standing or flowing water. The fabric shall be placed and loosely laid over the surface smoothly.

The fabric panels shall be overlapped a minimum of 18 inches for vertical laps and 24 inches for horizontal laps. The fabric shall be placed parallel to the direction of flow. It shall be placed so that the upstream end or higher panel will be placed under the downstream or lower panel.

When the fabric is used in application for wave action, the panel should be placed up and down the slope.

At vertical laps, securing pins shall be inserted through both layers along a line through the approximate midpoint of the overlap. At horizontal laps, securing pins shall be inserted through the bottom layer only. The pins shall be placed at not greater than 12-foot intervals. Securing pins shall be placed along a line approximately 2 inches in from the edge of the outer limits of the completed filter cloth area at intervals not greater than 12 feet. Additional pins shall be installed as necessary to prevent any slippage of the fabric, regardless of location.

Fabric damaged or displaced before or during installation or during placement of overlying layers of riprap shall be replaced or repaired to the original design and as approved by the Engineer, the fabric shall not be placed unless the riprap or other material can be used to cover it within the same working day.

When riprap is to be placed on the fabric, stones shall not be dropped from a height greater than the following:

A. For stones up to 100 pounds in weight, the drop shall not be more than 3 feet.

B. For stones between 100 and 500 pounds in weight, the drop shall not be more than 1 foot.

C. For stones over 500 pounds in weight; the stone shall be placed on the cloth, not dropped.

D. Pushing or rolling rocks over the fabric will not be allowed.

TABLE 1. REQUIREMENTS FOR WOVEN GEOTEXTILES

Property	Test Method	Class I	Class II & III	Class IV
Tensile Strength (pounds) 1/	ASTM D 4632 Grab Test	200 minimum in principal direction	120 minimum in any principal direction	180 min. in any principal direction
Elongation at Failure (percent) 1/	ASTM D 4632 Grab Test	<50	<50	<50
Puncture (pounds) 1/	ASTM D 4833	90 minimum	60 minimum	60 minimum
Ultraviolet Light (percent residual tensile strength)	ASTM D 4355 150-hours exposure	70 minimum	70 minimum	70 minimum
Apparent Opening Size – (AOS)	ASTM D 4751	As specified or a minimum-#70 2/	As specified or a minimum #70 2/	As specified or minimum #70 2/
Percent Open Area 3/ (percent)	TM5-818-8 4/	4.0 minimum	4.0 minimum	1.0 minimum
Permittivity sec^{-1}	ASTM D 4491	0.10 minimum	0.10 minimum	0.10 minimum

1/ Minimum average roll value (weakest principal direction).

2/ U. S. Standard Sieve Size.

3/ If Percent Open Area information is not available, the geotextile should be rated for filtration. Consult the manufacturer for the soils that the fabric is rated for.

4/ NOTE: TM5-818-8 is an Army Technical Manual

TABLE 2. REQUIREMENTS FOR NON-WOVEN GEOTEXTILES

Property	Test Method	Class I	Class II	Class III	Class IV 3/
Tensile Strength (pounds) 1/	ASTM D 4632 Grab Test	180 minimum	120 minimum	90 minimum	115 min.
Elongation at Failure (percent) 1/	ASTM D 4632	≥50	≥50	≥50	≥50
Puncture (pounds)	ASTM D 4833	80 minimum	60 minimum	40 minimum	40 minimum
Ultraviolet Light (percent residual tensile strength)	ASTM D 4355 150-hours exposure	70 minimum	70 minimum	70 minimum	70 minimum
Apparent Opening Size – (AOS)	ASTM D 4751	As specified max. # 40 2/	As specified max. # 40 2/	As specified max. # 40 2/	As specified max. # 40 2/
Permittivity sec^{-1}	ASTM D 4491	0.70 minimum	0.70 minimum	0.70 minimum	0.10 min.

1/ Minimum average roll value (weakest principal direction)

2/ U. S. Standard Sieve Size.

3/ Heat-bonded or resin-bonded geotextile may be used for Class III and IV. They are particularly well suited for Class IV. Needle-punched geotextiles are required for all other classes.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION CONSTRUCTION SPECIFICATION

907 - ROCK RIPRAP

I. SCOPE

The work shall consist of furnishing and installing loose rock riprap at the locations and to the lines, grades, elevations, and cross-sections as shown on the drawings.

II. MATERIALS

Rock

Rock shall be sound, dense, and durable with a bulk specific gravity of not less than 2.5. Rock shall be angular to subrounded in shape with the greatest dimension not greater than 2 times the least dimension. The rock shall conform to the grading limits given below unless otherwise specified on the Practice Requirements sheet.

Size, Inches	Percent Passing
24	100
12	50
6	20
3	10

Filter or Bedding

When filter or bedding material is shown on the drawings, the material shall be composed of clean, hard and durable mineral particles free from organic matter, clay balls or other deleterious substances.

Bedding may be pit run material of sand, gravel, crushed stone or a mixture thereof.

Filter material shall conform to the gradation given in the Special Requirements listed on the "Practice Requirements" sheet.

III. SUBGRADE PREPARATION

The subgrade surfaces on which the riprap, bedding, filter, or geotextile is to be placed shall be cleared and graded prior to placement of bedding, geotextile, or rock.

When fill to subgrade lines is required, it shall consist of approved materials and shall conform to the requirements of appropriate sections of Conservation Construction Specification 903, Earthfill. Subgrade surfaces shall not steeper than 1.5 horizontal to 1 vertical.

IV. PLACEMENT

Equipment Placed Rock Riprap

The riprap shall be constructed to the full course thickness in one operation and in such a manner as to avoid displacement of the underlying materials. The rock shall be delivered and placed in a manner that will insure that the riprap in place shall be reasonably homogeneous with the larger rocks uniformly distributed and firmly in contact one to another with the smaller rocks and spalls filling the voids between the larger rocks.

Riprap shall be placed in a manner to prevent damage to structures. Hand placing will be required to the extent necessary to prevent damage to the permanent works and to achieve the finished surface placement.

Hand Placed Riprap

Rocks shall be securely bedded firmly in contact one to another. Spaces between the larger rocks shall be filled with smaller rocks and spalls. Smaller rocks shall not be grouped as a for substitute larger rock. Flat slab rock shall be laid on edge.

Filter Layers or Bedding

When specified, the filter, bedding, or geotextile beneath the rock shall be placed on the prepared subgrade as specified in the Special Requirements listed on the "Practice Requirements" sheet. Compaction of filter layers or bedding will not be required, but the surface of such material shall be finished reasonably free of mounds, dips, or windrows.

V. VEGETATIVE COVER

Unless otherwise specified in the "Practice Requirements" sheet, a protective cover of vegetation shall be established on the area disturbed area. The planting of vegetative materials shall conform to the requirements of Practice Specification 342, Critical Area Planting.

VI. SPECIAL MEASURES

Measures and construction methods shall be incorporated as needed and practical that enhances fish and wildlife values. Special attention shall be given to protecting visual resources and maintaining key shade, food and den trees.

VII. CONSTRUCTION OPERATIONS

Construction operations shall be done in such a manner that erosion and air and water pollution are minimized and held within legal limits. The owner, operator, Contractor or other persons will conduct all work and operations in accordance with proper safety codes for the type of construction being performed with due regards to the safety of all persons and property.

The completed job shall be workmanlike and present a good appearance.

U.S DEPARTMENT OF AGRICULTURE
NATURAL RESOURCES CONSERVATION SERVICE
CALIFORNIA

PRACTICE REQUIREMENTS
FOR
468 - LINED WATERWAY OR OUTLET

638 – WATER AND SEDIMENT CONTROL BASIN

For: Business Name Skypark Santa's Village LLC.

Job Location

County San Bernardino RCD Farm/Tract No. 1113/18064

Referral No. Prepared By Haejin Lee Date 10/27/2015

IT SHALL BE THE RESPONSIBILITY OF THE OWNER TO OBTAIN ALL NECESSARY PERMITS AND/OR RIGHTS, AND TO COMPLY WITH ALL ORDINANCES AND LAWS PERTAINING TO THIS INSTALLATION.

Installation shall be in accordance with the following drawings, specifications and special requirements. NO CHANGES ARE TO BE MADE IN THE DRAWINGS OR SPECIFICATIONS WITHOUT PRIOR APPROVAL OF THE NRCS TECHNICIAN.

1. Drawings, No. RC15-02

2. Practice Specifications , 468, 903,905,907 ,

3. Type of Lining Rock Riprap Thickness 12 to 24 (inches)

4. Earthfill Compaction by Method:

5. Special Requirements:

Water and Sediment Control Basin (638): Inside side slope 3 horizontal: 1 vertical.

Earthfill (903): All surplus excavated materials will be designated as waste and shall be disposed of at sites remote from the project.

Geotextile Fabric (905): 8 oz/sy Non -Woven needle punched Geotextile, Class I

Rock Riprap (907): Please see the rock grading in the construction drawing

6. Special Maintenance Requirements: Refer to "Operation and Maintenance"

PRACTICE APPROVAL:

Job Classification for Lined Waterway (468): (Ref: Section 501 NEM)

Show the limiting elements for this job. This job is classified as, Class ___V_____

Limiting elements:		Units
Drainage area	89.5	acres
Capacity	59	cfs

Design Approved by: Elizabeth K. Mc... Date: 10/29/15

Job Classification for Water & Sediment Control Basin (638): (Ref: Section 501 NEM)

Show the limiting elements for this job. This job is classified as, Class ____II_____

Limiting elements:		Units
Storage	0.33	ac-ft
Height of fill	0	ft

Design Approved by: Haejin Lee Date: 10/27/2015

LANDOWNER'S/OPERATOR'S ACKNOWLEDGEMENT:

The landowner/operator acknowledges that:

a. He/she has received a copy of the construction drawings and specification, and that he/she has an understanding of the contents, and the requirements.

b. He/she has obtained all the necessary permits.

c. No changes will be made in the installation of the job without prior concurrence of the NRCS technician.

d. Maintenance of the installed work is necessary for proper performance during the project life.

Accepted by:_____ Date:_____

PRACTICE COMPLETION:

I have made an on site inspection of the site (or I am accepting owner/contractor documentation), and have determined that the job as installed does conform to the drawings and practice specifications.

Completion Certification by:

/s/_____ Date _____

NATURAL RESOURCES CONSERVATION SERVICE
DETAIL PLANS FOR

WATER & SEDIMENT CONTROL BASIN and LINED WATERWAY FOR SKYPARK SANTA'S VILLAGE LLC.

INDEX OF DRAWINGS

SHEET NUMBER	TITLE
1	Cover
2	Plan View
3	Plan View – Sediment Basin South
4	Profile View – Sediment Basin South
5	Plan View – Sediment Basin Middle
6	Profile View – Sediment Basin Middle
7	Plan View – Sediment Basin North
8	Profile View – Sediment Basin North
9	Section View – Rock Lined Waterway South
10	Section View – Rock Lined Waterway Middle
11	Section View – Rock Lined Waterway North

General Notes:

1. *All construction shall be in accordance with these drawings and attached specifications: Water and Sediment Control Basin (638), Lined Waterway(468), Earthfill(903), Geotextile Fabric (905), and Rock Riprap (907). No changes are to be made without the prior approval of the NRCS Technician/Engineer.*

2. *Landowner shall be responsible for obtaining any needed permits, easements, and/or right–of–ways, and meeting all legal requirements.*

3. *Landowner shall be responsible for locating and protecting all utilities. Special safety precautions are be taken when working in the vicinity of gas, oil or electrical lines. Underground Service Alert(USA) shall be notified a minimum of two working days at 1–800–227–2600 before any excavation or trenching.*

4. *Cal –OSHA safety requirements shall be in effect during all construction.*

5. *All lines and grades shown on these drawings are approximate. Exact location of the structures shall be staked in the field by the NRCS engineer/technician.*

6. *Contact the Natural Resources Conservation Service at least 7 days prior to construction at 909–799–7407.*

Date 10/2015
Designed Haejin Lee
Drawn # HL
Checked # EKM
Approved

Elizabeth K Merlo
Area Engineer
10/29/15

San Bernardino County, CA

COVER
Skypark Santa's Village LLC.

USDA United States Department of Agriculture
Natural Resources Conservation Service

File No. santasvillage_plan.dwg

Drawing No. RC15–02

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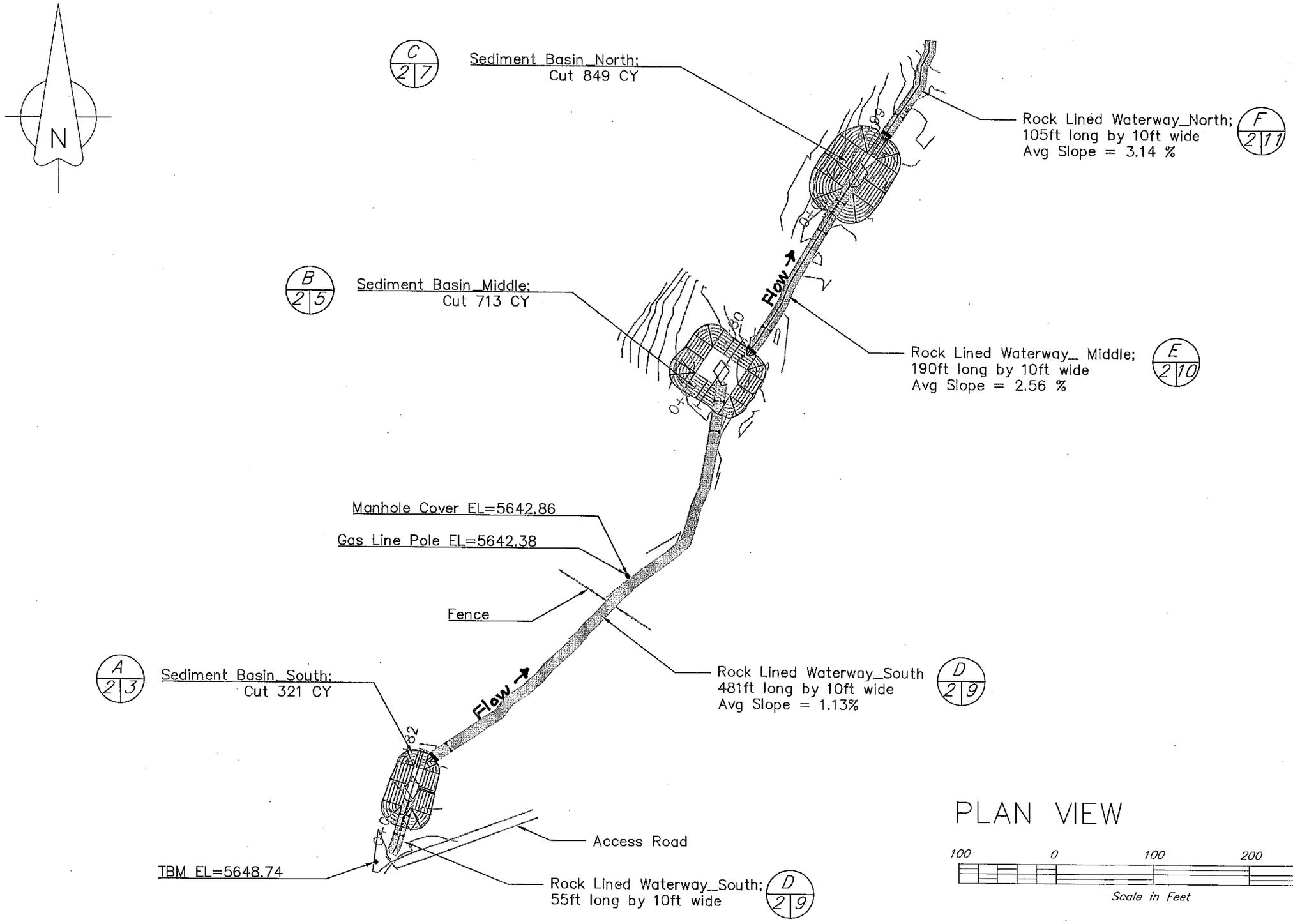
Sheet 1 of 11



PLAN VIEW

100 0 100 200 300

Scale in Feet

PLAN VIEW
Skypark Santa's Village LLC

San Bernardino County, CA

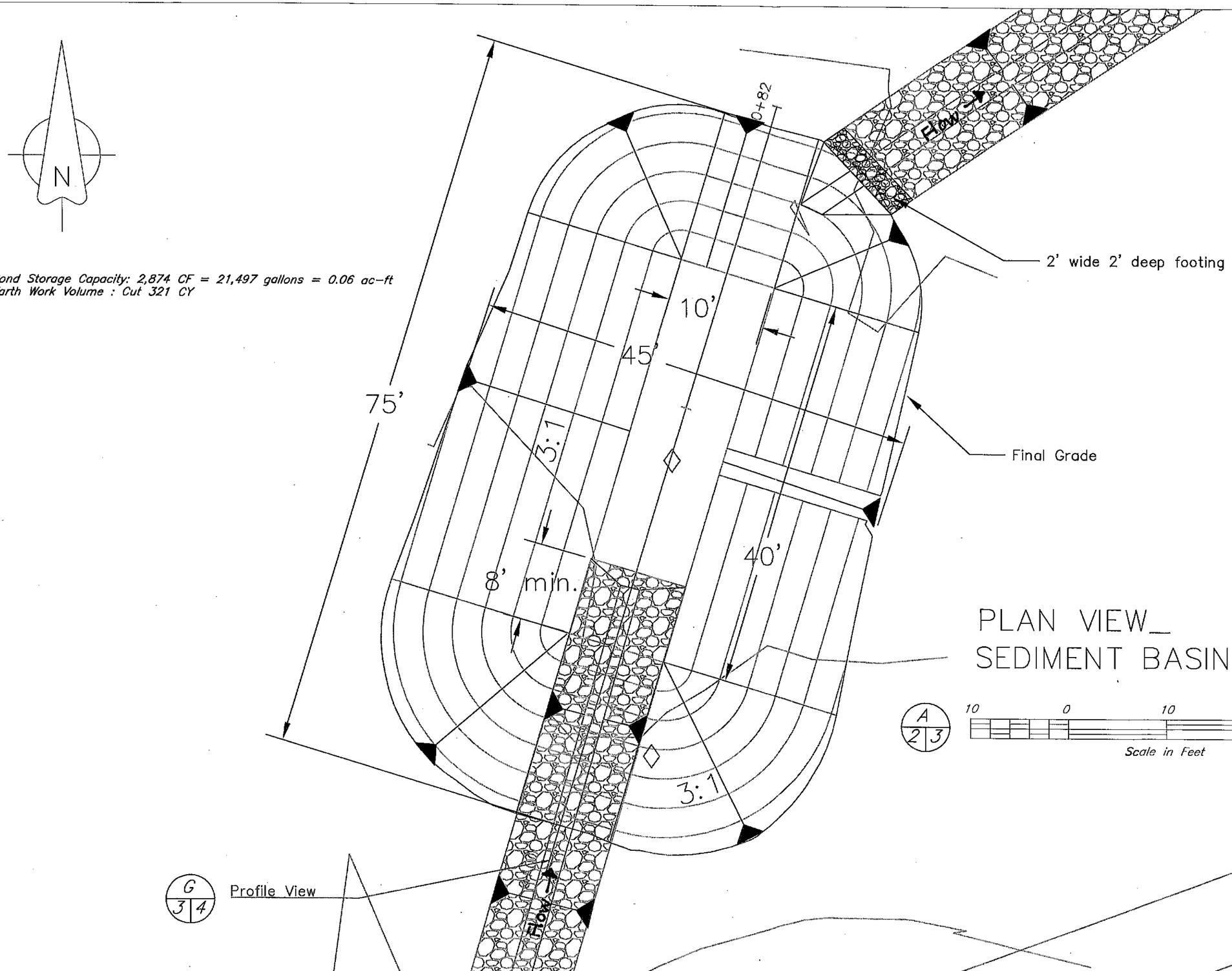
Date 10/2015
Designed Haejin Lee
Drawn #
Checked #
Approved

United States Department of Agriculture
Natural Resources Conservation Service

File No. santavillage_plan.dwg

Drawing No. RC15-02

10/23/15 5:30 PM
Sheet 2 of 11



Designed Haejin Lee Date 10/2015
Drawn # #
Checked # #
Approved

PLAN VIEW_SEDIMENT BASIN SOUTH
Skypark Santa's Village LLC
San Bernardino County, CA

United States Department of Agriculture
Natural Resources Conservation Service

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Drawing No. RC15-02

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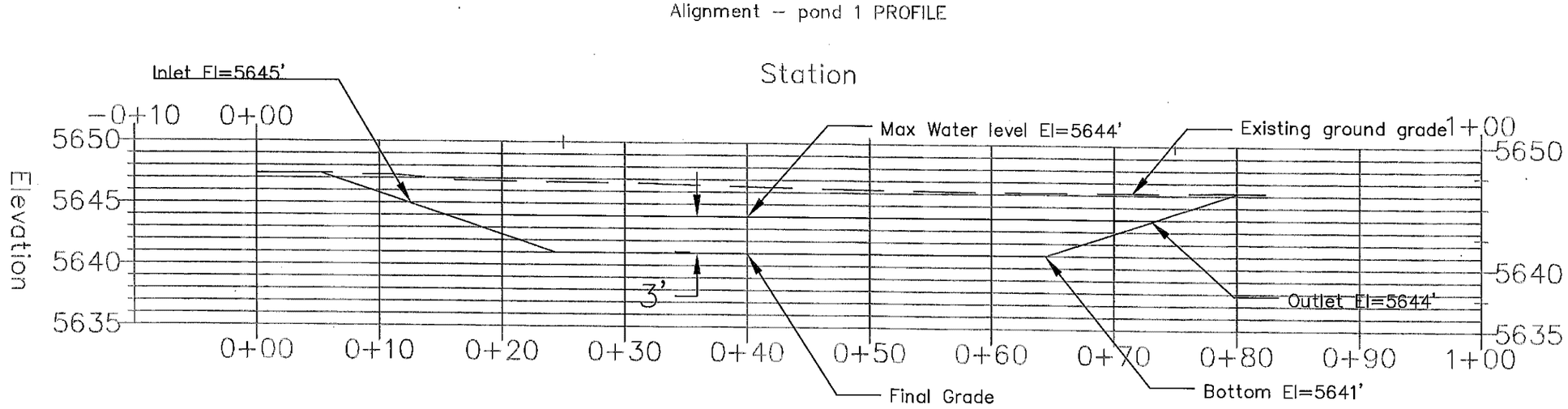
Sheet 3 of 11



G 3|4 PROFILE VIEW_SEDIMENT BASIN SOUTH

10 0 10 20 30

Scale in Feet

Designed Haejin Lee Date 10/2015
Drawn # #
Checked # #
Approved

PROFILE VIEW_SEDIMENT BASIN SOUTH
Skypark Santa's Village LLC

San Bernardino County, CA

USDA United States Department of Agriculture
Natural Resources Conservation Service

File No. santasvillage_plan.dwg

Drawing No. RC15-02

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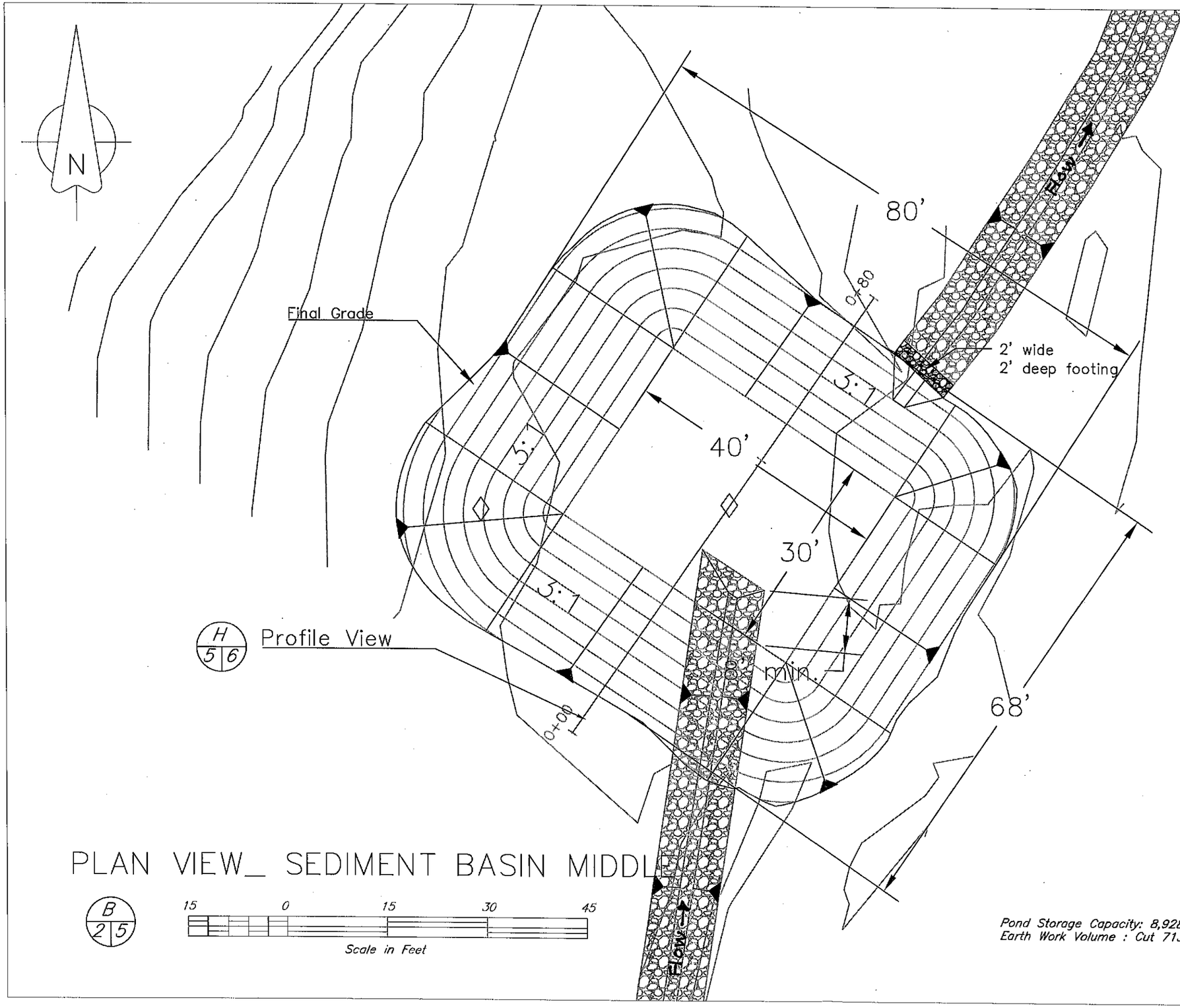
Sheet 4 of 11



PLAN VIEW_ SEDIMENT BASIN MIDDLE

B
2 5

15 0 15 30 45

Scale in Feet

Pond Storage Capacity: 8,928 CF = 66,781 gallons = 0.2 ac-ft
Earth Work Volume : Cut 713 CY

PLAN VEIW_SEDIMENT BASIN MIDDLE
Skypark Santa's Village LLC

San Bernardino County, CA

Designed *Haejin Lee* Date *10/2015*
Drawn # #
Checked # #
Approved

United States Department of Agriculture
Natural Resources Conservation Service

File No. *santalvillage_plan.dwg*

Drawing No. *RC15-02*

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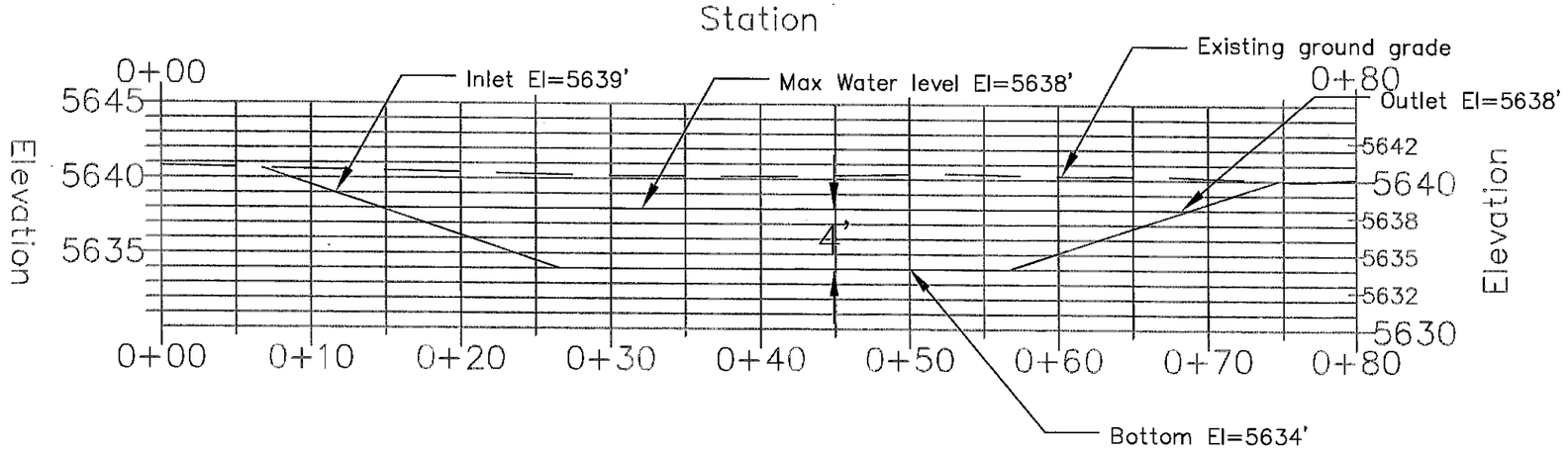
Sheet *5* of *11*

Alignment – pond 2 PROFILE



H 5|6 PROFILE VIEW_SEDIMENT BASIN MIDDLE

10 0 10 20 30

Scale in Feet

Designed Haejin Lee Date 10/2015
Drawn #
Checked #
Approved

PROFILE VIEW_SEDIMENT BASIN MIDDLE
Skypark Santa's Village LLC
San Bernardino County, CA

United States Department of Agriculture
Natural Resources Conservation Service

File No. santasvillage_plan.dwg

Drawing No. RC15-02

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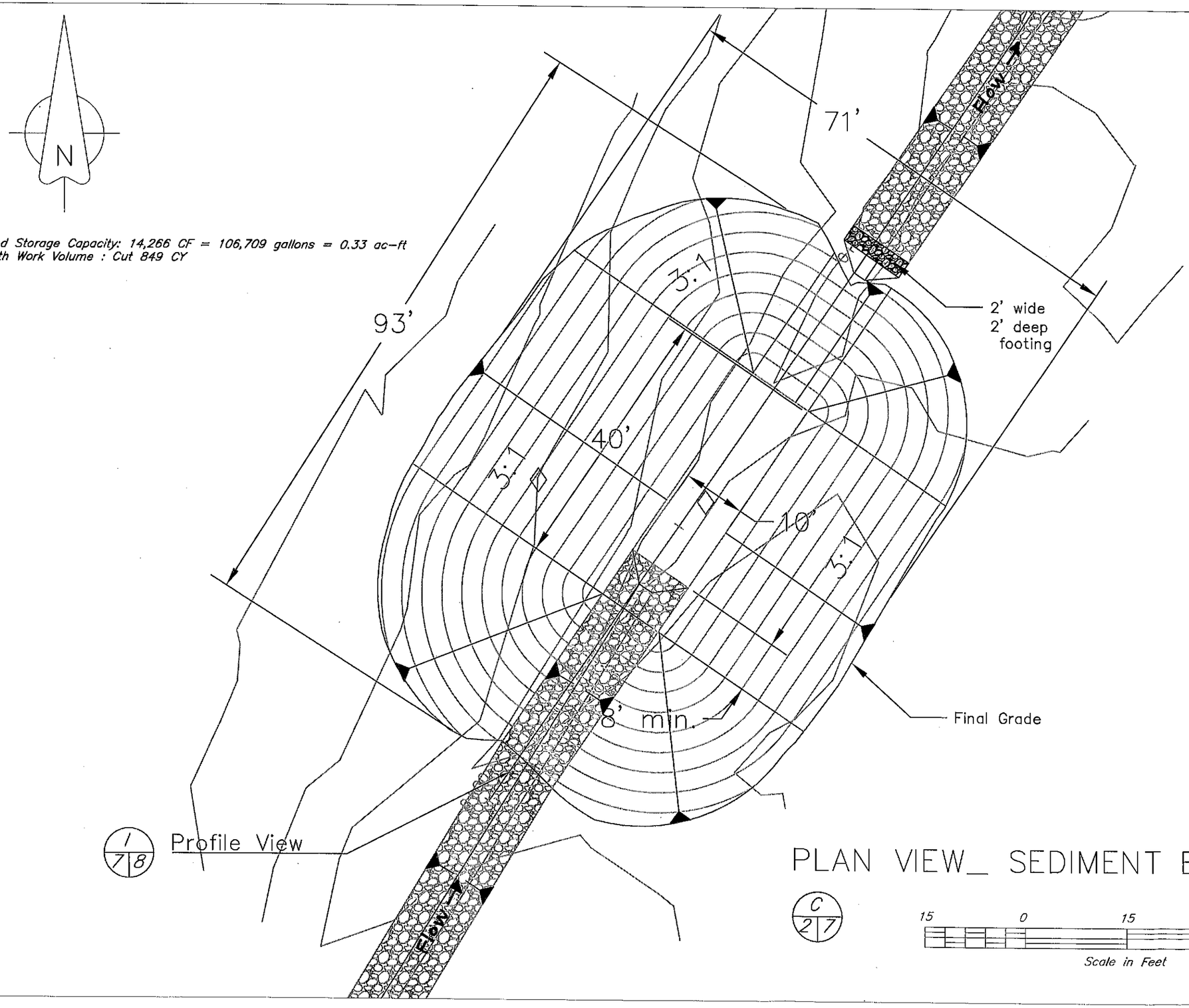
Sheet 6 of 11



Designed Haejin Lee Date 10/2015
Drawn # #
Checked # #
Approved

PLAN VIEW_SEDIMENT BASIN NORTH
Skypark Santa's Village LLC
San Bernardino County, CA

United States Department of Agriculture
Natural Resources Conservation Service

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Drawing No. RC15-02

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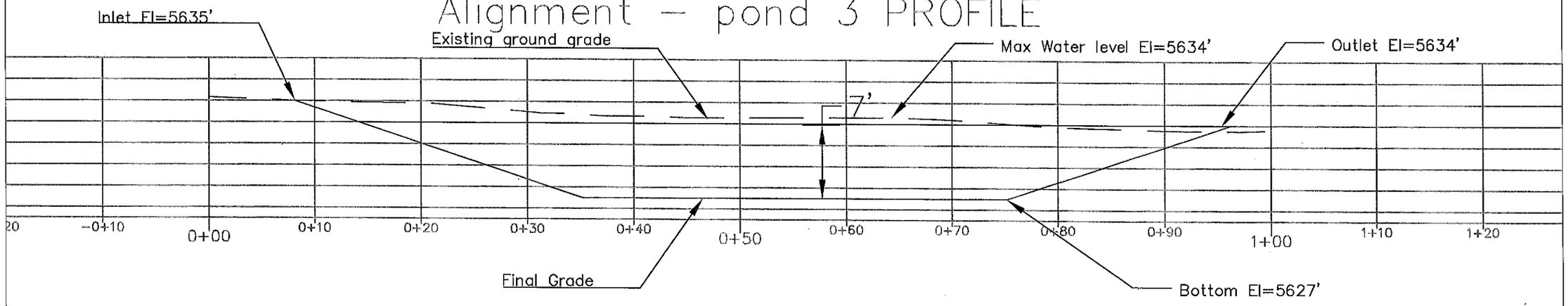
Sheet 7 of 11



1/18 PROFILE VIEW_SEDIMENT BASIN NORTH

10 0 10 20 30

Scale in Feet

Designed Haejin Lee Date 10/2015
Drawn #
Checked #
Approved

PROFILE VIEW_SEDIMENT BASIN NORTH
Skypark Santa's Village LLC
San Bernardino County, CA

United States Department of Agriculture
USDA Natural Resources Conservation Service

File No. santavillage_plan.dwg

Drawing No. RC15-02

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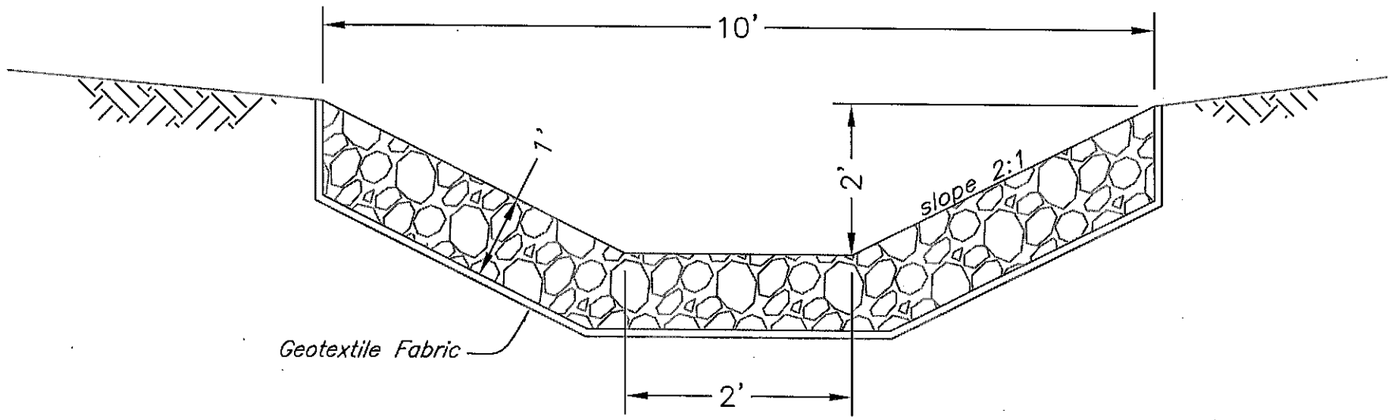
Sheet 8 of 11



NOTES:

All construction shall be in accordance with NRCS Standard and Specification 468. Lined Waterway or Outlet.

Rock Riprap Installation:
Rock shall be sound, dense, and durable with a bulk specific gravity of not less than 2.5. Rock shall be angular to subangular. See NRCS Specificatian 907. Rock Riprap. Riprap shall be placed, not dropped in a uniform gradation throughout.

The rock shall conform to the grading limits given below:

Size, inches	Percent Passing
12	100
6	50
3	20

Geotextile Fabric Installation:

1. Geotextile fabric is to be typed 2a, non-woven needle punched 8 oz/sy. See NRCS Specification 905. Geotextile Fabric.
2. The surface on which the geotextile is to be placed shall be graded to neat lines and be free of roots and sharp rocks that may puncture the fabric.
3. The fabric panels shall be overlapped a minimum of 18 inches for vertical laps and 24 inches for horizontal laps. The fabric shall be installed in according to manufacturer's recommendations. The fabric shall be pinned in place prior to rock placement.

D / 2|9 SECTION VIEW_ROCK LINED WATERWAY SOUTH (NOT TO SCALE)

Designed Haejin Lee Date 10/2015
Drawn # #
Checked # #
Approved

SECTION VIEW_ROCK LINED WATERWAY SOUTH
Skypark Santa's Village LLC
San Bernardino County, CA

USDA United States Department of Agriculture
Natural Resources Conservation Service

File No. santasvillage_plan.dwg
Drawing No. RC15-02
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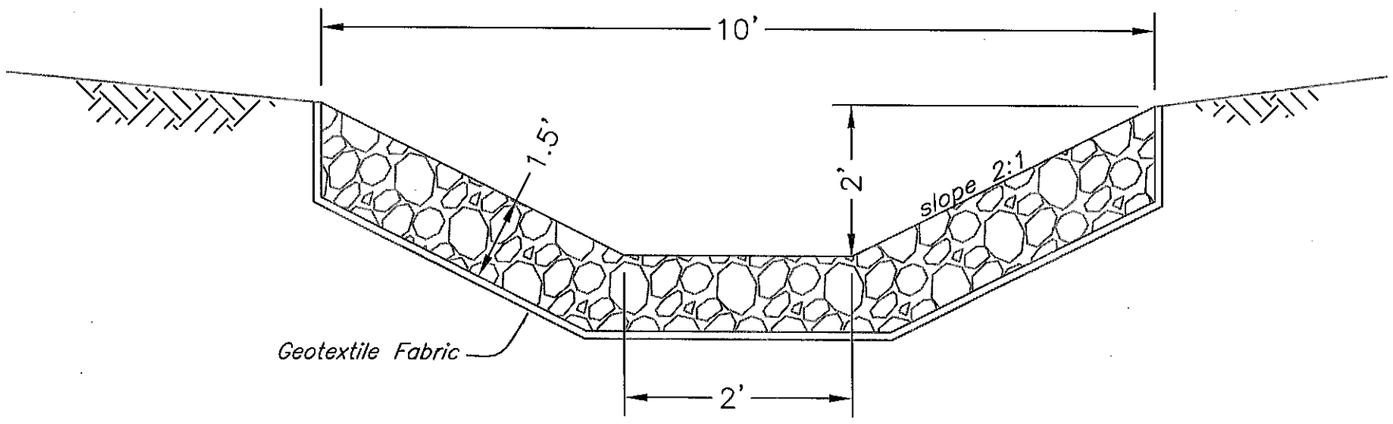
Sheet 9 of 11



NOTES:

All construction shall be in accordance with NRCS Standard and Specification 468. Lined Waterway or Outlet.

Rock Riprap Installation:
Rock shall be sound, dense, and durable with a bulk specific gravity of not less than 2.5. Rock shall be angular to subangular. See NRCS Specification 907. Rock Riprap. Riprap shall be placed, not dropped in a uniform gradation throughout.

The rock shall conform to the grading limits given below:

Size, inches	Percent Passing
18	100
9	50
6	20
3	10

Geotextile Fabric Installation:

1. Geotextile fabric is to be typed 2a, non-woven needle punched 8 oz/sy. See NRCS Specification 905. Geotextile Fabric.
2. The surface on which the geotextile is to be placed shall be graded to neat lines and be free of roots and sharp rocks that may puncture the fabric.
3. The fabric panels shall be overlapped a minimum of 18 inches for vertical laps and 24 inches for horizontal laps. The fabric shall be installed in according to manufacturer's recommendations. The fabric shall be pinned in place prior to rock placement.

E 2|10 SECTION VIEW_ROCK LINED WATERWAY MIDDLE (NOT TO SCALE)

Designed Haejin Lee Date 10/2015
Drawn # Checked #
Approved

SECTION VIEW_ROCK LINED WATERWAY MIDDLE
Skypark Santa's Village LLC
San Bernardino County, CA

United States Department of Agriculture
Natural Resources Conservation Service

File No. santaVillage_plan.dwg

Drawing No. RC15-02

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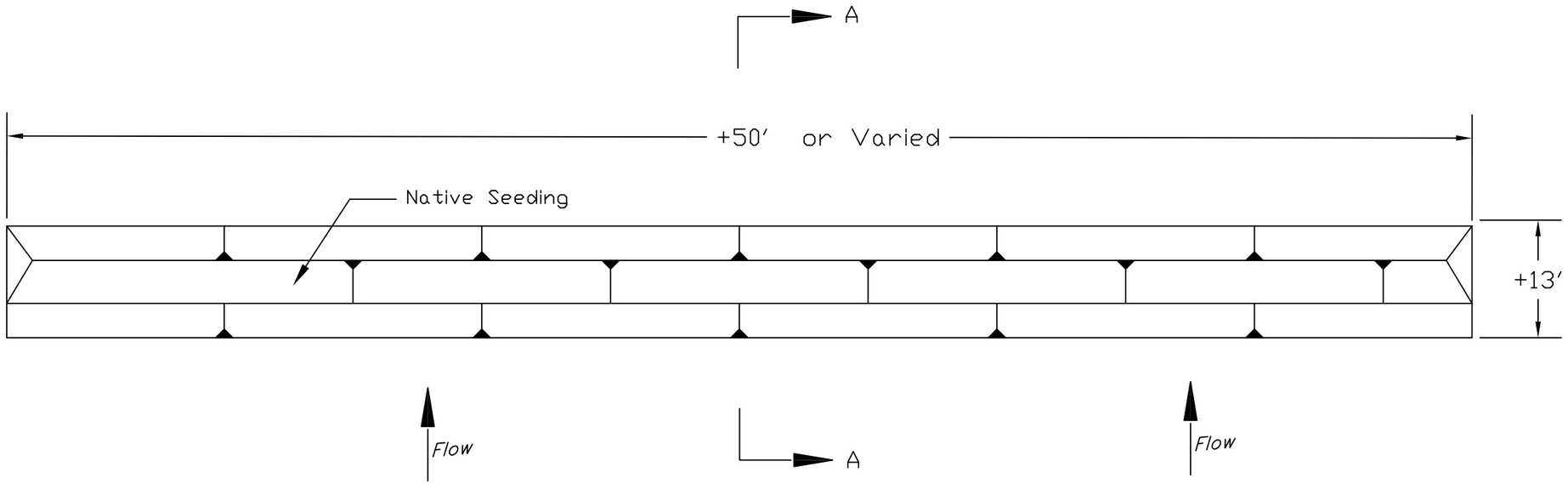
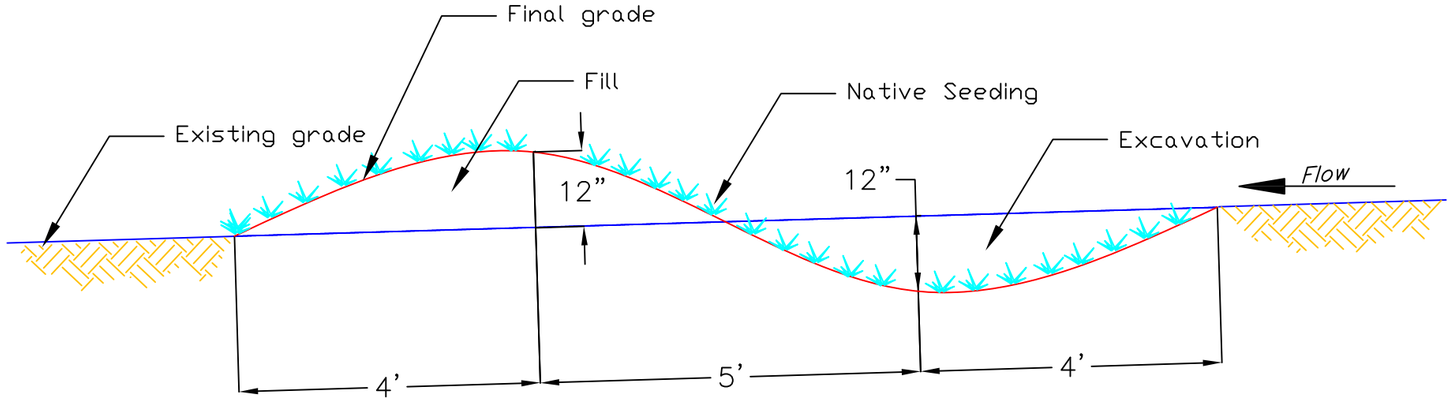
Sheet 10 of 11



TOP VIEW _ EARTHEN BERM (NTS)

NOTES:

All Earthen Berms(Water Bars) shall be angled at 90 degrees from a line drawn perpendicular to the direction of flow.



SECTION A-A (NTS)

Designed Haejin Lee. Date 2/17/2017.
Drawn . .
Checked . .
Approved . .

SKYPARK SANTA'S VILLAGE LLC
Earthen Berm Detail
Page 2 of 2

Riverside County, CA

United States Department of Agriculture
Natural Resources Conservation Service

File No.
EarthenBerm_SantaVilla

Drawing No.
RC-02----

2/17/17 9:55 AM
Sheet 2 of 2.

Appendix L: Cumulative Traffic Analysis with Church of the Woods

TABLE 1

FULL BUILD-OUT PLUS PROJECT CONDITIONS (YEAR 2035) - WITH CHURCH OF THE WOODS PROJECT

SATURDAY PEAK HOUR LEVELS OF SERVICE

No	Intersection	Peak Hour	Full Build-Out (Year 2035)		Full Build-Out Plus Project (Year 2035)		Change in Delay (sec)	Impact [b]
			Delay (sec)	LOS [a]	Delay (sec)	LOS [a]		
1.	State Route 189 & State Route 18 [c]	A.M.	15.3	B	15.3	B	0.0	NO
2.	Daley Canyon Road & State Route 18 [d]	A.M.	15.8	C	15.9	C	0.1	NO
3.	State Route 173 & State Route 18 [d]	A.M.	15.5	C	17.3	C	1.8	NO

Notes:

[a] All locations analyzed using HCM methodology

[b] Significant Impact determined using County of San Bernardino methodology

[c] Signalized intersection

[d] Unsignalized intersection

TABLE 2

FULL BUILD-OUT PLUS PROJECT CONDITIONS (YEAR 2035) - WITH CHURCH OF THE WOODS PROJECT

SUNDAY PEAK HOUR LEVELS OF SERVICE

No	Intersection	Peak Hour	Full Build-Out (Year 2035)		Full Build-Out Plus Project (Year 2035)		Change in Delay (sec)	Impact [b]
			Delay (sec)	LOS [a]	Delay (sec)	LOS [a]		
1.	State Route 189 & State Route 18 [c]	A.M.	17.9	B	18.9	B	1.0	NO
2.	Daley Canyon Road & State Route 18 [d]	A.M.	20.3	C	21.3	C	1.0	NO
3.	State Route 173 & State Route 18 [d]	A.M.	22.7	C	27.1	D	4.4	NO

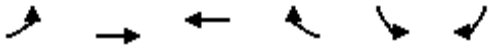
Notes:

[a] All locations analyzed using HCM methodology

[b] Significant Impact determined using County of San Bernardino methodology

[c] Signalized intersection

[d] Unsignalized intersection



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	49	332	399	87	164	95
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1765	1765	1765	1667	1765
Adj Flow Rate, veh/h	49	332	399	87	164	95
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	218	716	482	410	508	480
Arrive On Green	0.00	0.41	0.27	0.27	0.32	0.32
Sat Flow, veh/h	1587	1765	1765	1500	1587	1500
Grp Volume(v), veh/h	49	332	399	87	164	95
Grp Sat Flow(s),veh/h/ln	1587	1765	1765	1500	1587	1500
Q Serve(g_s), s	0.1	6.0	9.3	2.0	3.4	2.0
Cycle Q Clear(g_c), s	0.1	6.0	9.3	2.0	3.4	2.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	218	716	482	410	508	480
V/C Ratio(X)	0.23	0.46	0.83	0.21	0.32	0.20
Avail Cap(c_a), veh/h	287	968	645	549	508	480
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.5	9.5	14.9	12.3	11.3	10.8
Incr Delay (d2), s/veh	0.5	0.5	6.6	0.3	1.7	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.6	3.0	5.3	0.8	1.7	2.0
LnGrp Delay(d),s/veh	20.0	10.0	21.5	12.5	13.0	11.7
LnGrp LOS	C	A	C	B	B	B
Approach Vol, veh/h		381	486		259	
Approach Delay, s/veh		11.3	19.9		12.5	
Approach LOS		B	B		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				23.7		20.0	5.8	18.0
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				26.0		16.0	4.0	18.0
Max Q Clear Time (g_c+I1), s				8.0		5.4	2.1	11.3
Green Ext Time (p_c), s				4.7		0.6	0.0	2.7

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	204	433	330	2	15	267
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	204	433	330	2	15	267

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	332	0	-	0	1172	331
Stage 1	-	-	-	-	331	-
Stage 2	-	-	-	-	841	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1227	-	-	-	213	711
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	423	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1227	-	-	-	178	711
Mov Cap-2 Maneuver	-	-	-	-	178	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	353	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	15.8
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1227	-	-	-	613
HCM Lane V/C Ratio	0.166	-	-	-	0.46
HCM Control Delay (s)	8.5	-	-	-	15.8
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.6	-	-	-	2.4

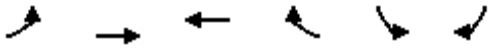
Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	37	169	215	178	138	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	169	215	178	138	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	393	0	-	0	547	304
Stage 1	-	-	-	-	304	-
Stage 2	-	-	-	-	243	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1166	-	-	-	498	736
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	797	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1166	-	-	-	482	736
Mov Cap-2 Maneuver	-	-	-	-	482	-
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	772	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1166	-	-	-	538
HCM Lane V/C Ratio	0.032	-	-	-	0.368
HCM Control Delay (s)	8.2	-	-	-	15.5
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	1.7



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	49	386	406	87	166	95
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1765	1765	1765	1667	1765
Adj Flow Rate, veh/h	49	386	406	87	166	95
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	218	725	492	419	504	476
Arrive On Green	0.00	0.41	0.28	0.28	0.32	0.32
Sat Flow, veh/h	1587	1765	1765	1500	1587	1500
Grp Volume(v), veh/h	49	386	406	87	166	95
Grp Sat Flow(s),veh/h/ln	1587	1765	1765	1500	1587	1500
Q Serve(g_s), s	0.1	7.3	9.5	2.0	3.5	2.0
Cycle Q Clear(g_c), s	0.1	7.3	9.5	2.0	3.5	2.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	218	725	492	419	504	476
V/C Ratio(X)	0.22	0.53	0.82	0.21	0.33	0.20
Avail Cap(c_a), veh/h	286	960	640	544	504	476
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.6	9.8	14.9	12.2	11.5	11.0
Incr Delay (d2), s/veh	0.5	0.6	6.7	0.2	1.7	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.6	3.6	5.5	0.8	1.8	2.1
LnGrp Delay(d),s/veh	20.1	10.4	21.6	12.4	13.2	11.9
LnGrp LOS	C	B	C	B	B	B
Approach Vol, veh/h		435	493		261	
Approach Delay, s/veh		11.5	20.0		12.8	
Approach LOS		B	C		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				24.1		20.0	5.8	18.3
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				26.0		16.0	4.0	18.0
Max Q Clear Time (g_c+I1), s				9.3		5.5	2.1	11.5
Green Ext Time (p_c), s				4.9		0.6	0.0	2.8

Intersection Summary	
HCM 2010 Ctrl Delay	15.3
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	204	490	338	2	5	267
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	224	538	371	2	5	293

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	374	0	-	0	1360	373
Stage 1	-	-	-	-	373	-
Stage 2	-	-	-	-	987	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1184	-	-	-	164	673
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	361	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1184	-	-	-	133	673
Mov Cap-2 Maneuver	-	-	-	-	133	-
Stage 1	-	-	-	-	696	-
Stage 2	-	-	-	-	293	-

Approach	EB	WB	SB
HCM Control Delay, s	2.6	0	15.9
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1184	-	-	-	626
HCM Lane V/C Ratio	0.189	-	-	-	0.477
HCM Control Delay (s)	8.7	-	-	-	15.9
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.7	-	-	-	2.6

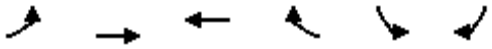
Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	37	227	223	179	146	60
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	227	223	179	146	60

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	402	0	-	0	614	313
Stage 1	-	-	-	-	313	-
Stage 2	-	-	-	-	301	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1157	-	-	-	455	727
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	751	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1157	-	-	-	440	727
Mov Cap-2 Maneuver	-	-	-	-	440	-
Stage 1	-	-	-	-	741	-
Stage 2	-	-	-	-	727	-

Approach	EB	WB	SB
HCM Control Delay, s	1.2	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1157	-	-	-	497
HCM Lane V/C Ratio	0.032	-	-	-	0.414
HCM Control Delay (s)	8.2	-	-	-	17.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	61	312	478	162	194	163
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1765	1765	1765	1667	1765
Adj Flow Rate, veh/h	61	312	478	162	194	163
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	198	780	545	464	477	451
Arrive On Green	0.00	0.44	0.31	0.31	0.30	0.30
Sat Flow, veh/h	1587	1765	1765	1500	1587	1500
Grp Volume(v), veh/h	61	312	478	162	194	163
Grp Sat Flow(s),veh/h/ln	1587	1765	1765	1500	1587	1500
Q Serve(g_s), s	0.2	5.6	12.0	3.9	4.5	4.0
Cycle Q Clear(g_c), s	0.2	5.6	12.0	3.9	4.5	4.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	198	780	545	464	477	451
V/C Ratio(X)	0.31	0.40	0.88	0.35	0.41	0.36
Avail Cap(c_a), veh/h	396	1099	644	547	477	451
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	20.9	8.8	15.2	12.5	13.0	12.8
Incr Delay (d2), s/veh	0.9	0.3	11.6	0.5	2.6	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.7	2.8	7.5	1.6	2.3	3.8
LnGrp Delay(d),s/veh	21.7	9.1	26.8	12.9	15.5	15.0
LnGrp LOS	C	A	C	B	B	B
Approach Vol, veh/h		373	640		357	
Approach Delay, s/veh		11.2	23.3		15.3	
Approach LOS		B	C		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				26.6		20.0	6.2	20.4
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				31.0		16.0	8.0	19.0
Max Q Clear Time (g_c+I1), s				7.6		6.5	2.2	14.0
Green Ext Time (p_c), s				5.9		0.8	0.0	2.4

Intersection Summary	
HCM 2010 Ctrl Delay	17.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	281	447	455	0	0	377
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	281	447	455	0	0	377

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	455	0	-	0	1464	455
Stage 1	-	-	-	-	455	-
Stage 2	-	-	-	-	1009	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1106	-	-	-	141	605
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	352	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1106	-	-	-	105	605
Mov Cap-2 Maneuver	-	-	-	-	105	-
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	263	-

Approach	EB	WB	SB
HCM Control Delay, s	3.6	0	20.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1106	-	-	-	605
HCM Lane V/C Ratio	0.254	-	-	-	0.623
HCM Control Delay (s)	9.4	-	-	-	20.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	1	-	-	-	4.3

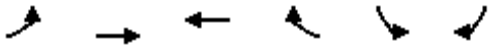
Intersection	
Int Delay, s/veh	7.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	144	198	177	162	140	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	144	198	177	162	140	115

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	339	0	-	0	744	258
Stage 1	-	-	-	-	258	-
Stage 2	-	-	-	-	486	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1220	-	-	-	382	781
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	618	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1220	-	-	-	337	781
Mov Cap-2 Maneuver	-	-	-	-	337	-
Stage 1	-	-	-	-	785	-
Stage 2	-	-	-	-	545	-

Approach	EB	WB	SB
HCM Control Delay, s	3.5	0	22.7
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1220	-	-	-	453
HCM Lane V/C Ratio	0.118	-	-	-	0.563
HCM Control Delay (s)	8.3	-	-	-	22.7
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	0.4	-	-	-	3.4



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	61	366	485	162	196	163
Number	7	4	8	18	1	16
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1667	1765	1765	1765	1667	1765
Adj Flow Rate, veh/h	61	366	485	162	196	163
Adj No. of Lanes	1	1	1	1	1	1
Peak Hour Factor	1.00	1.00	1.00	1.00	1.00	1.00
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	192	776	542	460	479	452
Arrive On Green	0.00	0.44	0.31	0.31	0.30	0.30
Sat Flow, veh/h	1587	1765	1765	1500	1587	1500
Grp Volume(v), veh/h	61	366	485	162	196	163
Grp Sat Flow(s),veh/h/ln	1587	1765	1765	1500	1587	1500
Q Serve(g_s), s	0.2	6.8	12.2	3.9	4.6	4.0
Cycle Q Clear(g_c), s	0.2	6.8	12.2	3.9	4.6	4.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	192	776	542	460	479	452
V/C Ratio(X)	0.32	0.47	0.90	0.35	0.41	0.36
Avail Cap(c_a), veh/h	425	1102	608	517	479	452
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	9.2	15.4	12.5	12.9	12.7
Incr Delay (d2), s/veh	0.9	0.4	14.8	0.5	2.6	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(-26165%),veh/ln	0.8	3.3	8.2	1.6	2.3	3.8
LnGrp Delay(d),s/veh	22.0	9.6	30.2	13.0	15.5	14.9
LnGrp LOS	C	A	C	B	B	B
Approach Vol, veh/h		427	647		359	
Approach Delay, s/veh		11.4	25.9		15.2	
Approach LOS		B	C		B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs				4		6	7	8
Phs Duration (G+Y+Rc), s				26.4		20.0	6.2	20.2
Change Period (Y+Rc), s				4.0		4.0	4.0	4.0
Max Green Setting (Gmax), s				31.0		16.0	9.0	18.0
Max Q Clear Time (g_c+I1), s				8.8		6.6	2.2	14.2
Green Ext Time (p_c), s				6.3		0.8	0.1	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	18.9
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	281	504	463	0	1	377
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	100	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	281	504	463	0	1	377

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	463	0	-	0	1529	463
Stage 1	-	-	-	-	463	-
Stage 2	-	-	-	-	1066	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1098	-	-	-	129	599
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	331	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1098	-	-	-	96	599
Mov Cap-2 Maneuver	-	-	-	-	96	-
Stage 1	-	-	-	-	634	-
Stage 2	-	-	-	-	246	-

Approach	EB	WB	SB
HCM Control Delay, s	3.4	0	21.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1098	-	-	-	591
HCM Lane V/C Ratio	0.256	-	-	-	0.64
HCM Control Delay (s)	9.4	-	-	-	21.3
HCM Lane LOS	A	-	-	-	C
HCM 95th %tile Q(veh)	1	-	-	-	4.5

Intersection	
Int Delay, s/veh	8.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	144	256	185	163	148	115
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	90	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	100	100	100	100	100	100
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	144	256	185	163	148	115

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	348	0	-	0	811	267
Stage 1	-	-	-	-	267	-
Stage 2	-	-	-	-	544	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1211	-	-	-	349	772
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	582	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1211	-	-	-	308	772
Mov Cap-2 Maneuver	-	-	-	-	308	-
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	513	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	27.1
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1211	-	-	-	418
HCM Lane V/C Ratio	0.119	-	-	-	0.629
HCM Control Delay (s)	8.4	-	-	-	27.1
HCM Lane LOS	A	-	-	-	D
HCM 95th %tile Q(veh)	0.4	-	-	-	4.2