



## **DRAINAGE STUDY**

# **APPLE VALLEY SELF-STORAGE**

PROJECT NO: 22E-050  
LOCATION: 12050 Itoya Vista Road  
Apple Valley, CA 92308

February 2, 2024

**PREPARED FOR:**  
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APPLE VALLEY SELF-STORAGE  
12050 ITOYA VISTA ROAD  
APPLE VALLEY, CA 92308

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## I. INTRODUCTION

The proposed Apple Valley Self-Storage (The Project) is located at the southwest corner of the intersection of Itoya Vista Road and Bear Valley Road in San Bernardino County (APN: 043-404-215). The Project consists of new storage buildings, curbing, refuse container, parking and landscaping on the existing undeveloped site.

### A. EXISTING CONDITIONS

The existing site is 4.4 acres and slopes from the southwest to northeast corner. There are also large slopes from the roads down to the rest of the lot. Per the USGS web soil survey data, soil type C is present on the site.

The existing on-site peak flow is 13.1 cfs and the off-site flow is 24.3 cfs for a total 37.4 cfs.

A summary of these calculations can be found in the Appendix.

## II. PROJECT INTENT

### A. DESIGN DOCUMENTATION

Drainage design flows are based on criteria provided in the San Bernardino County Hydrology Manual.

This project will utilize the existing topography to convey stormwater runoff. The flows will be conveyed into a bioretention basin. The bioretention basin is sized to ensure that in the proposed condition the runoff does not exceed the existing condition.

### B. PROPOSED CONDITIONS

The proposed conditions include new buildings, asphalt parking lot, vertical curb, a refuse enclosure, sidewalk, biofiltration, and landscaping. The site is proposed to have moderate slopes of around 0.5-4%. Stormwater will be conveyed away from the buildings into the bioretention area at the northeast corner.

The post construction unmitigated flow rate for the 100-year peak storm is 17.4 cfs. A summary of these calculations is in the Appendix.

The flows from the adjacent property to the south will be held in a pond on the south side of the project site. The flow from the property to the west will flow into a swale and be directed to a pond at the northwest corner of the site. Therefore, the proposed drainage does not alter the existing drainage or cause any additional erosion or siltation onsite or offsite.

The attached calculations include a summary of the 100-year, 1-hour storm event for the existing conditions and proposed unmitigated rates. The basin is sized to accommodate flows so that the discharge in the post condition does not exceed the existing condition.

In the case of a storm larger than the design storm, water will fill the bioretention area and then flow back through storm drain and outfall from the DI in the northwest corner. It will then flow through the overland release into the neighboring property and continue west along the existing flow path.

### C. PUBLIC SAFETY

The proposed project will not expose a public safety hazard. There are no levees or dams onsite and the biofiltration basin provided is oversized to provide enough retention to mitigate flows from the 100-year storm event. The offsite flows are also taken onsite to the bioretention basin thus effectively reducing the post-construction flow off the project area to below the pre-construction condition. No risk or injury, loss or death is involved with the project.

### III. CONCLUSIONS

#### A. SUMMARY

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Based on the results of the Project Drainage design, the following can be concluded:

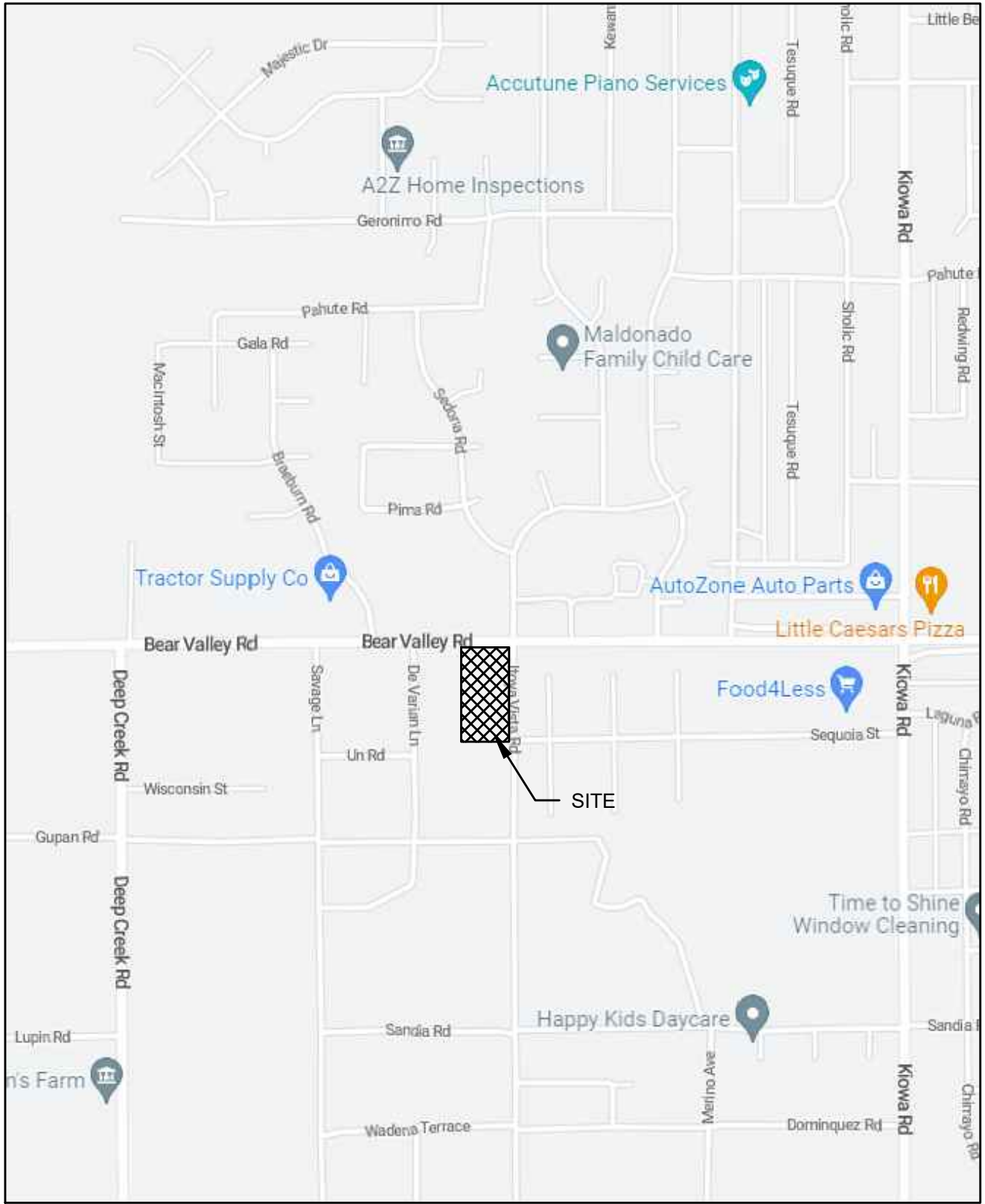
- The post-construction condition flow rate is not higher than the existing flow rate for discharge from the site
  - A bioretention basin is provided to ensure stormwater quality and is sized to meet the SWQM requirements to mitigate any increase in post development flows
  - The Project does not alter the existing drainage pattern, increase flow rates, or cause any additional erosion or siltation on or offsite due to the proposed biofiltration basin and the mitigated flow by additional retention basin
  - The Project does not pose any safety risk to the public
- 

Respectfully,

Jordan Baldwin, PE  
Principal Engineer

## FIGURES





APPLE VALLEY SELF-STORAGE  
**VICINITY MAP**

12050 ITOYA VISTA ROAD, APPLE VALLEY, CA 92308

PROJECT NO.:	22E-050
DATE:	2/2/24

FIGURE 1

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**APPLE VALLEY SELF STORAGE**  
**WATERSHED EXHIBIT**

**12050 ITOYA VISTA ROAD, APPLE VALLEY, CA 92308**

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DATE: 02/02/2024

FIGURE 2

## APPENDIX





**APPLE VALLEY SELF-STORAGE FLOW RATES AND VOLUMES  
100-YR, 1-HR STORM**

Area Description	T <sub>c</sub> (min)	I (in/hr)	CN	F <sub>p</sub> (in/hr)	a <sub>i</sub>	a <sub>p</sub>	C	A (sf)	Q (cfs)	R (in)	R (ft)	Volume (ft <sup>3</sup> )
Pre-Construction												
Project Site	17.3	3.9	98	0.13	0	1	0.87	167022	13.1	1.2	0.1	14530.9
Adjacent Parcel A	21.8	3.3	98	0.13	0	1	0.86	90732	6.0	1.2	0.1	7844.2
Adjacent Parcel B	20.6	3.4	98	0.13	0	1	0.87	96022	6.5	1.2	0.1	8311.6
Bear Valley Road	9.4	6.0	98	0.13	1	0	0.90	49329	6.2	1.2	0.1	4439.6
Itoya Vista Road	14	4.5	98	0.13	1	0	0.90	59313	5.6	1.2	0.1	5338.2
								Total:	37.4		Total:	40464.4
Post-Construction												
DMA 1	11.8	5.1	98	0.13	1	0	0.90	60878	6.5	1.2	0.1	5479.0
DMA 2	9.8	5.8	98	0.13	1	0	0.90	11568	1.4	1.2	0.1	1041.1
DMA 3	8.0	6.7	98	0.13	1	0	0.90	6767	0.9	1.2	0.1	609.0
DMA 4	8.0	6.7	98	0.13	1	0	0.90	21763	3.0	1.2	0.1	1958.7
DMA 5	10.9	5.4	98	0.13	1	0	0.90	29603	3.3	1.2	0.1	2664.3
DMA 6	7.3	7.1	98	0.13	1	0	0.90	1081	0.2	1.2	0.1	97.3
LAND	22	3.3	86	0.50	0	1	0.76	35362	2.1	1.2	0.1	2700.4
								Total:	17.4		Total:	8029.6