

A Plan for Conversion of Stormwater to Groundwater Recharge on the Utah Valley University Main Campus, Orem, Utah

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Abstract. At the present time 73% of the surface area of the main campus of Utah Valley University in Orem, Utah, is included in watersheds from which all of the stormwater is exported to Utah Lake. Although there are four boulder-lined detention ponds on campus, they are used only as holding ponds before the stormwater is exported. The objective of this study was to determine what percentage of the stormwater generated by a 100-year 24-hour precipitation event could potentially be retained on campus and used for groundwater recharge. The objective was addressed by considering the conversion of portions of existing grassy areas into French drains without any disruption of current paved areas or other built infrastructure. It was determined that the main campus is divided into 33 watersheds that currently export stormwater and 27 additional self-contained watersheds. The surface runoff during a 100-year 24-hour precipitation event from each watershed was calculated using the NRCS Runoff Curve Method. It was shown that the existing detention ponds (receiving stormwater from two watersheds) have sufficient storage and infiltration capacity so that no export of stormwater is necessary. Out of 31 of the remaining watersheds that export stormwater, French drains could be constructed in 11 watersheds that would remove any need for exporting stormwater. Ceasing pumping from the existing detention ponds and constructing 11 additional French drains with a combined surface area of 0.982 ac would reduce the stormwater exported in a 100-year 24-hour precipitation event from 23.1 ac-ft to 15.7 ac-ft.

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