

**Date:** October 20, 2011

**To:** TOPAZ Regional Wireless Cooperative (TRWC) Board of Directors  
Dale Shaw, TRWC Executive Director

**From:** Randy Thompson

**Subject:** Administrator Update

### **Capital Projects**

**DC Power Plant Equipment** – this equipment provides power to the radio and microwave equipment at the TRWC radio sites. The previous equipment was more than ten years old and was failing at an increasing rate. The new equipment will improve the reliability of the TRWC radio site equipment and the TRWC 800 MHz radio system. The new equipment has been installed, tested, accepted, and the project is complete.

**Spread Spectrum Microwave Radios** – this project will replace the microwave radios currently in use between the Twin Knolls site and Apache Junction Fire Station 264, and the TRW site and Apache Junction Fire Station 262. The existing microwave radios operate in unlicensed radio spectrum, which is susceptible interference, and causes reduced reliability of the radio network connectivity to the TRWC sites at Apache Junction Fire Station 264, Apache Junction Fire Station 262, and Apache Junction Police Dispatch. New microwave radios will be installed utilizing licensed microwave frequencies which are far less susceptible to interference. This project is expected to start early in calendar year 2012.

**Thompson Peak Communications Facility Improvements** – this joint project with the Arizona Department of Public Safety (DPS) will construct a new 180-foot radio tower, equipment building, and emergency generator on Thompson Peak, which the TRWC’s primary backup and wide-area coverage site. An Intergovernmental Agreement (IGA) has been executed between the City of Mesa (as Administrative Manager for the TRWC) and Maricopa County, and a three-way site supplemental agreement to the IGA between Mesa, Maricopa County, and DPS has been executed. The current forecast for the start of construction is November, 2011, with a duration of approximately 4 months.

**Inter Sub Site Interface (ISSI)** – this project would implement “system of systems” networking to provide interoperability with other regional communications systems, such as the Yuma Regional Communications System (YRCS), which hosts the Arizona Department of Public Safety (DPS) and Arizona Department of Transportation, the Phoenix Regional Wireless Cooperative (RWC), and future systems, such as Maricopa County. A simplified project utilizing talkgroups patched through an audio bridge hosted by DPS is under development, and is awaiting the completion of a governance agreement by the Arizona Department of Administration’s Public

Safety Interoperable Communications Office. A full ISSI implementation is unlikely in the near future.

**Public Safety Wireless Broadband** – this is the Long Term Evolution (LTE) project which will provide wireless broadband services to Public Safety and other governmental users. This project is moving ahead, as the Federal Communications Commission issued a ruling on the use of the 700 MHz radio frequencies utilized by this technology to allow licensees to determine the users of these systems. It is anticipated this project will go to the Mesa City Council for contract award during the current fiscal year. It is undetermined when or if this project and/or technology will become part of the TRWC portfolio.

### **Operations Summary**

**System Availability** – please refer to Figure 1 for the System Availability graph for the Simulcast Cell. During the period from June through September, 2011, the months of June, August, and September met or were better than the goal of 99.999% availability. In July, 2011, the availability fell below the goal due to a 41 second fade on both of the microwave paths to the TOPAZ site at Mesa Fire Station 205 caused by a heavy rain storm, and there was a 27 second outage of the Range Rider radio site due to human error by a City of Mesa Communications Technician. One of the two microwave radio paths to Mesa Fire Station 205, from the Twin Knolls site, has been replaced with microwave radios operating in a different frequency band than the path from the City of Mesa Communications Building in an effort to mitigate the outages of the TOPAZ site at Fire Station 205 due to heavy rain storms.

Although we do not report availability for the White Tanks site, the site was off the air for approximately 3-1/4 hours on Friday, September 9, 2011, beginning at 8:08 PM due to a power failure and the failure of the site emergency generator, which is serviced and maintained by the site owner, Salt River Project (SRP). Both the commercial power feed from Arizona Public Service and the emergency generator at this site have proven to be unreliable since the site began operation in February, 2010. There is no room in the SRP site for more batteries, so the best solution is to move to another site. A site on Shaw Butte, in the area of Thunderbird and Central Avenues in Phoenix, is being investigated as an alternate to White Tanks, and may provide better radio coverage to the west side of Phoenix and the western suburbs than the White Tanks site currently provides.

**Peak Channel Usage** – please refer to Figure 2 for the Simulcast Cell, Figure 3 for the Thompson Peak site, and Figure 4 for the White Tanks site for peak channel usage during June, July, August, and September, 2011. The Simulcast Cell had all channels in use twice during June, on the 18<sup>th</sup>, and on the 30<sup>th</sup>, when a transformer fire occurred at SRP's East Mesa Service Center substation, knocking out power to portions of Mesa, Apache Junction, and Gilbert. No busies were reported by users or system reports on either day. The Thompson Peak site continues to be lightly loaded, with no occurrences of all channels in use. The White Tanks site indicated all channels in use once during June, and once during July; again, no busies were reported by users or system reports. The process for adding a channel to the White Tanks site has begun with an application to the 700 MHz Regional Planning Committee for a frequency for an additional channel.

During the power outage caused by the SRP transformer fire on June 30<sup>th</sup> referenced above, the emergency generators at the Range Raider, East Mesa Service Center, Fire Station 205, Central Radio Site, and the City of Mesa Communications Building supplied power to the sites for 1-10 hours to keep the TOPAZ radio system operating. Only the generator at the Central Radio Site experienced any difficulty, and did not affect the operation of the TOPAZ radio system. The problems with that generator have since been found and repaired.

### TOPAZ System Availability

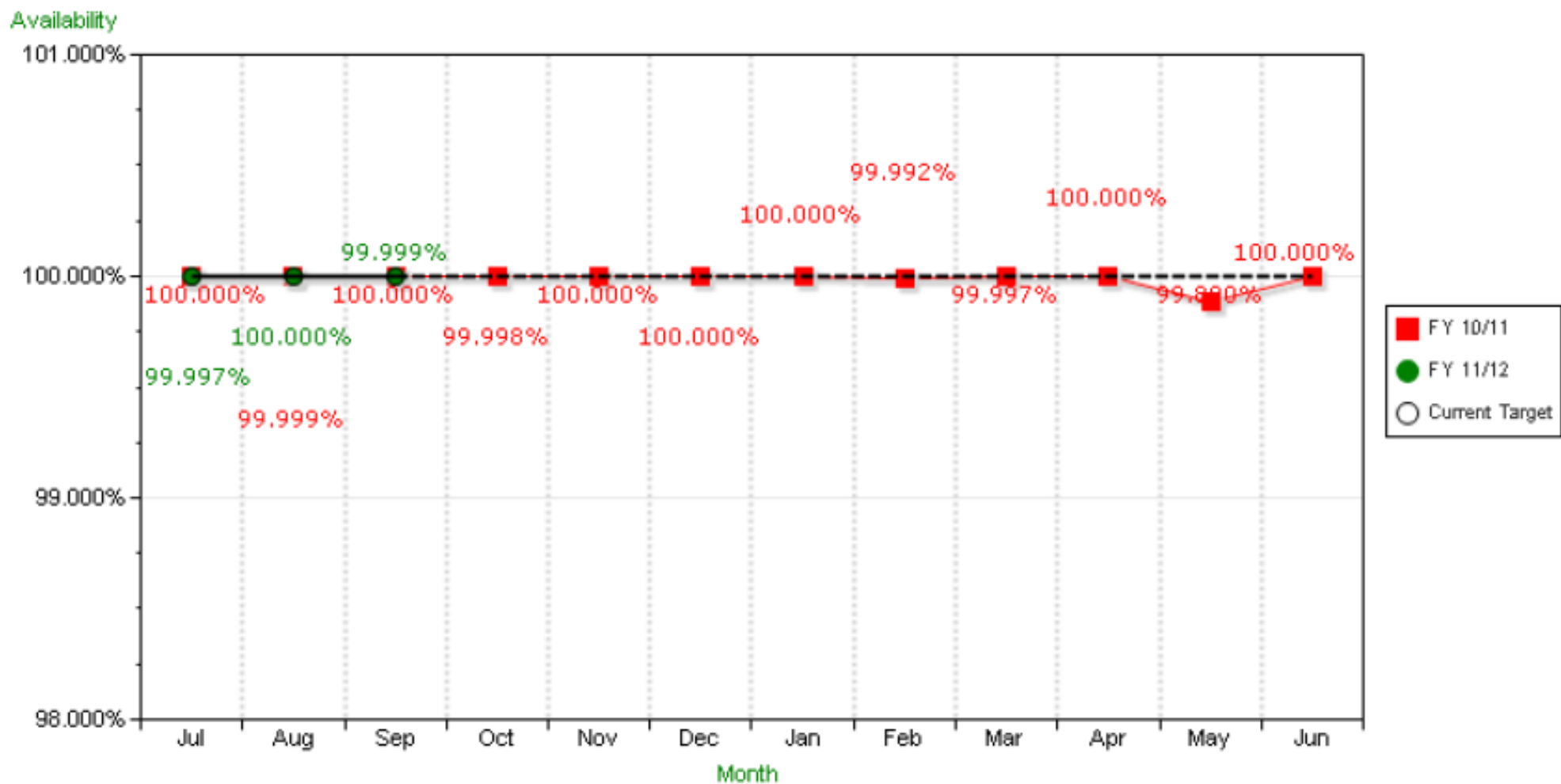
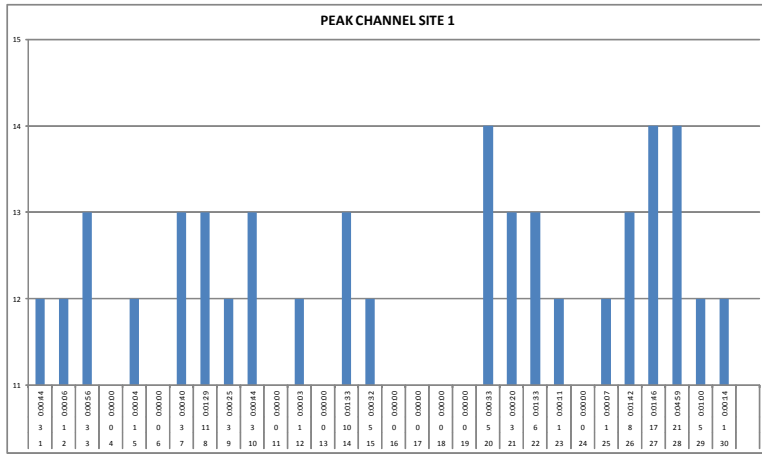
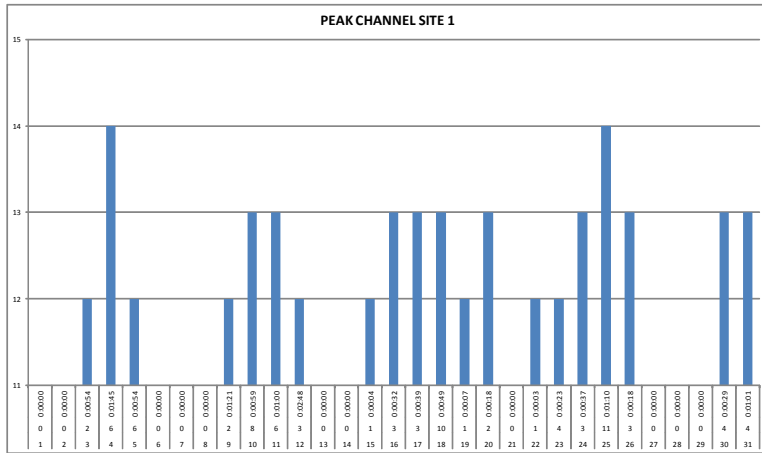


Figure 1 – System Availability

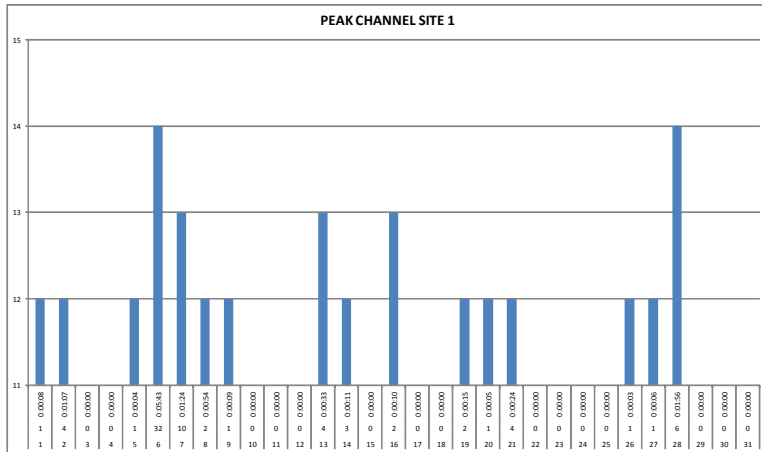
# Simulcast Cell – Peak Channel Use – June - September, 2011 (maximum 15 channels)



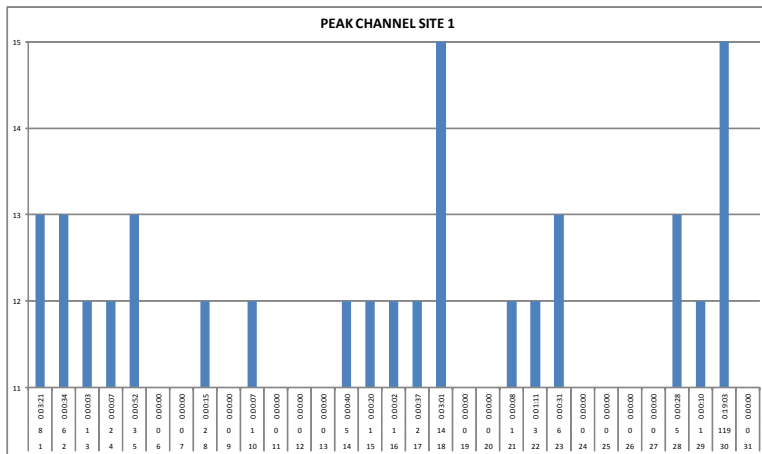
September, 2011



August, 2011



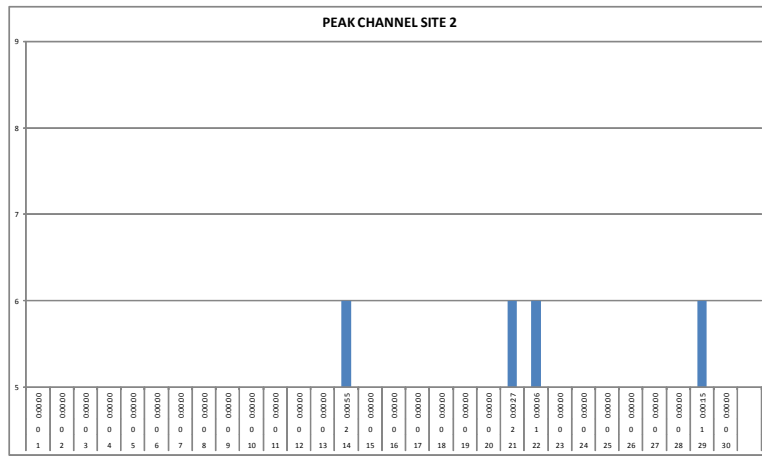
July, 2011



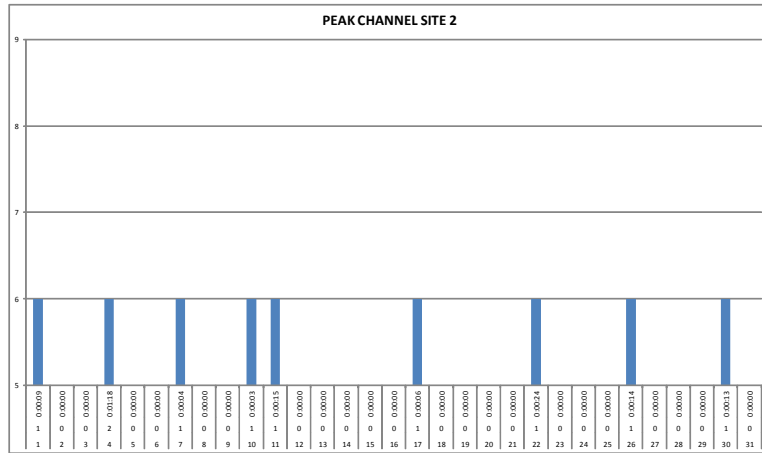
June, 2011

**Figure 2 – Simulcast Cell Peak Channel Usage**

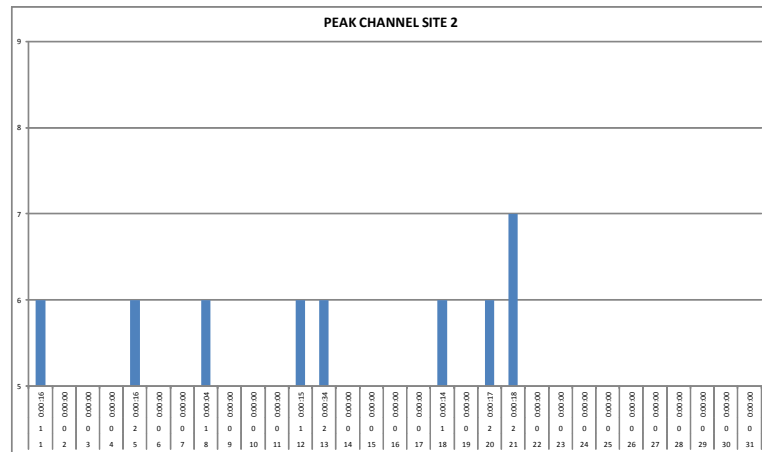
# Thompson Peak – Peak Channel Use – June - September, 2011 (maximum 9 channels)



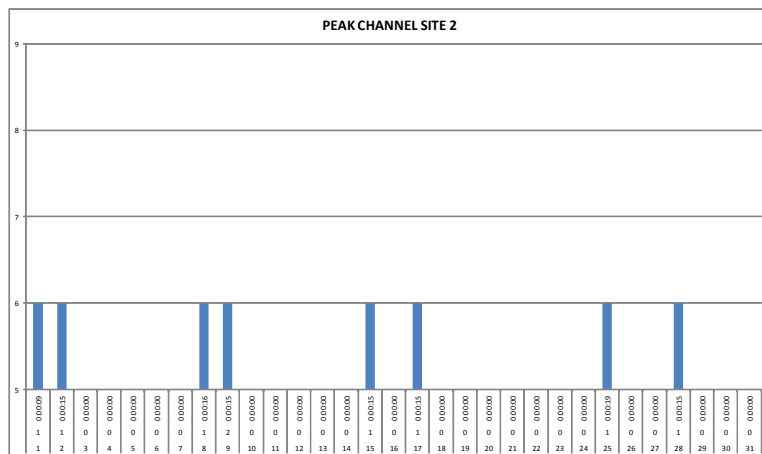
September, 2011



August, 2011



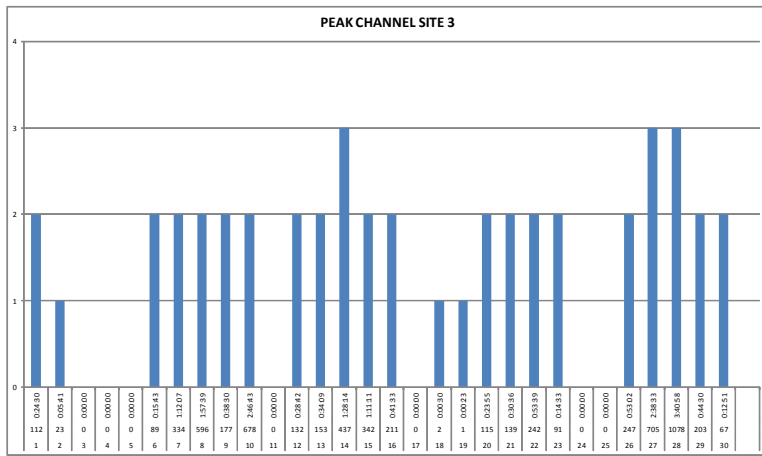
July, 2011



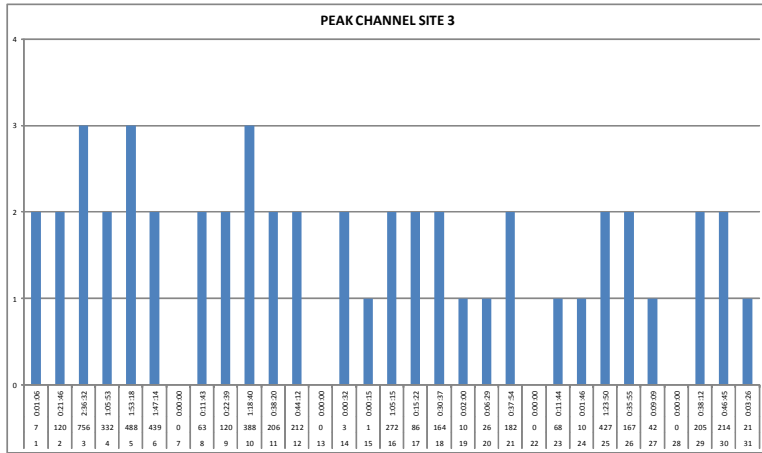
June, 2011

Figure 3 – Thompson Peak Peak Channel Usage

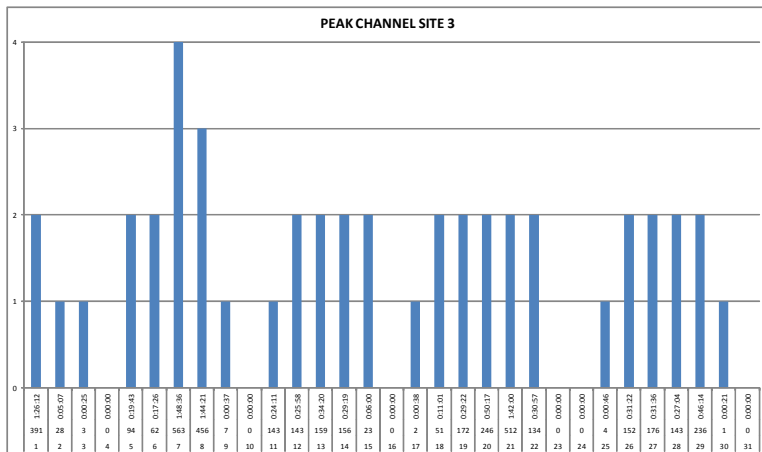
# White Tanks – Peak Channel Use – June - September, 2011 (maximum 4 channels)



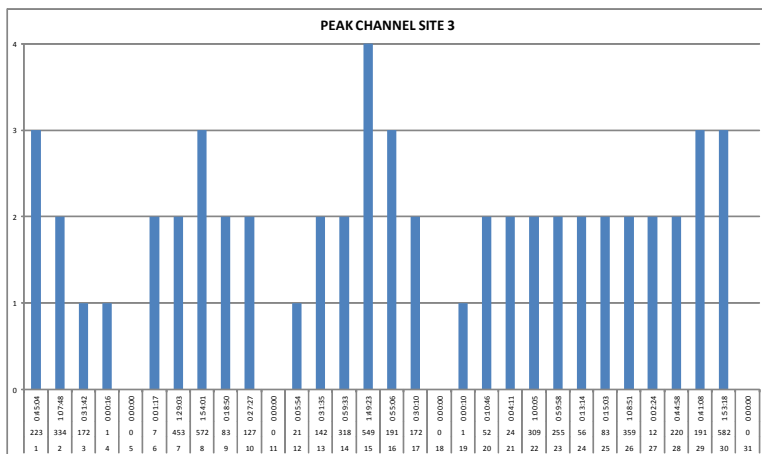
September, 2011



August, 2011



July, 2011



June, 2011

Figure 4 – White Tanks Peak Channel Usage