Title: QSU4 FY2016	***Author:*** Shannon, AD's	***Date:*** 11/10/2016
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National Radio Astronomy Observatory

Quarterly Status Update 4 FY2016

July - September 2016

PREPARED BY	ORGANIZATION	DATE
Mike Shannon/ADs	PMD	11/10/2016

APPROVALS (Name and Signature)			ORGANIZATION
Mike Shannon	Michael Shannon	Digitally signed by Michael Shannon Date: 2016.11.10 12:45:29 -05'00'	NRAO
Tony Beasley		Digitally signed by Tony Beasley Date: 2016.11.10 13:13:00 -05'00'	NRAO
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NRAO Quarterly Status Update
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				Q1 Performance Assessment			Q2 Performance Assessment			Q3 Performance Assessment			Q4 Performance Assessment		
POP Section Number	POP Milestone	Milestone	Completion Date	Cost	Schedule	Scope	Cost	Schedule	Scope	Cost	Schedule	Scope	Cost	Schedule	Technical
2.6		**Atacama Large Millimeter/submillimeter Array (ALMA)**													
		Operations													
	1	Cycle 3 observing & operations begin Q1, ongoing through Q4	12/31/2015												
			3/31/2016												
			6/30/2016												
			9/30/2016												
	2	Cycle 3 JAO Support: AoD support shifts at the OSF	12/31/2015												
			3/31/2016												
			6/30/2016												
			9/30/2016												
	3	Support Extension of Capability efforts at the JAO	12/31/2015												
			3/31/2016												
			6/30/2016												
			9/30/2016												
	4	Cycle 4: Participate in the Obsmode go / no-go meeting	12/31/2015												
	5	Cycle 4: s/w tests, documentation, CfP	3/31/2016												
	6	Offer data reduction workshop in Charlottesville	12/31/2015												
	7	Cycle 4: CDEs, User Support, Proposal Deadline Supp.	3/31/2016												
	8	Cycle 4: Tech Assessment, Tech Sec Supp.	6/30/2016												
	9	Cycle 5: Capabilities Planning	6/30/2016												
	10	Cycle 4: P2G and CS Assignments	9/30/2016												
	11	Cycle 4: SBs validated	9/30/2016												
	12	NAASC Science Workshop	6/30/2016												
	13	ALMA International Science Conference	9/30/2016												
	14	Synthesis Imaging Summer School participation	9/30/2016												
	15	Splatalogue Update	9/30/2016												
		Development													
	16	NA ALMA Development Projects for FY2014/2015 will be completed	3/31/2016												
	17	NA ALMA Development Projects – Next Call for Proposals	6/30/2016												
		NRAO-Chile Office													
	18	Completion of the succession and management plan 2015-2016 including the incorporation of a new Business Manager	12/31/2015												
	19	Implementation and monitoring of the new Collective Contract signed with the AUI Union as a result of the negotiations conducted in 2015	12/31/2015												
			3/31/2016												
			6/30/2016												
			9/30/2016												
	20	Renewal of the NRAO/AUI Office of Chilean Affairs lease for a new period of three years	12/31/2015												
3.4		**New Mexico Operations**													
		VLA Science Operations													
	1	Define VLA capabilities to be offered for semester 2016B	12/31/2015												
	2	Define VLA capabilities to be offered for semester 2017A	6/30/2016												
	3	Update VLA documentation to support 2016B Call for Proposals, perform proposal technical reviews	3/31/2016												
	4	Update VLA documentation to support 2017A Call for Proposals, perform proposal technical reviews	9/30/2016												
	5	Determine baselines and pointing for antennas moving into their D configuration locations	12/31/2015												
	6	Determine baselines and pointing for antennas moving into their DnC and C configuration locations	3/31/2016												
	7	Determine baselines and pointing for antennas moving into their CnB and B configuration locations	6/30/2016												
		VLA Array Operations													
	8	Complete reconfiguring array to D configuration	12/31/2015												
	9	Reconfigure array to DnC, then C configuration	3/31/2016												
	10	Reconfigure array to CnB, then B configuration	6/30/2016												
	11	Release Operations GSA vehicle(s)	12/31/2015												
		VLA Antenna Maintenance													
	12	Perform 8 antenna overhauls during the course of the year	9/30/2016												
	13	Replace one antenna azimuth bearing during the source of the year	9/30/2016										Cancelled		
	14	Perform preventive maintenance on each of two transporters prior to array reconfiguration	12/31/2015												
	15	Perform preventive maintenance on each of two transporters prior to array reconfiguration	6/30/2016												
		VLA Track Maintenance													
	16	Identify and replace 5000 aging or damaged cross-ties during the course of the year	9/30/2016												
	17	Identify and replace 5 antenna pad intersections during the course of the year	9/30/2016												
		VLA Site Infrastructure Maintenance													
	18	Perform preventive maintenance on VLA site hatch gear	12/31/2015												
	19	Perform preventive maintenance on all VLA site transformers during the course of the year	9/30/2016												
		VLA Technical Upgrades and Enhancements													

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	20	L-Band solar upgrade, 2 additional receivers with full RF upgrade installed	3/31/2016												
	21	X-Band solar upgrade, 6 additional receivers with 20 dB switched attenuators on outputs only, no solar Tcals, installed	9/30/2016												
	22	Ku-Band solar upgrade, 2 additional receivers with solar Tcal path plus 20 dB switched attenuators installed	6/30/2016												
	23	Ku-Band solar upgrade, 4 additional receivers with 20 dB switched attenuators on outputs only, no solar Tcals, installed	9/30/2016												
	24	S-Band solar upgrade, 3 additional receivers with solar Tcal path	9/30/2016												
	25	FE card cage upgrades, 35 units installed	3/31/2016												
	26	C-Band thermal gap retrofits, 4 additional installed	6/30/2016												
	27	L-Band thermal gap retrofits, 4 additional installed	9/30/2016												
	28	Install 10 production F318 modules in antennas	9/30/2016												
	29	Install three ACU units during the course of the year	9/30/2016												
		VLA Observing Capability Enhancements													
	30	Commission remaining P-Band functionality in the OPT for 2016B	6/30/2016												
		VLA Operational Enhancements													
	31	Implement continuous slew tipping scans	3/31/2016												
	32	Heuristics defined for ionospheric calibration for VLASS, pending test results demonstrating need	6/30/2016												
	33	Development in support of VLA Sky Survey preliminary design review	9/30/2016												
		VLBA Science Operations													
	34	Define VLBA capabilities to be offered for semester 2016B	12/31/2015												
	35	Define VLBA capabilities to be offered for semester 2017A	6/30/2016												
	36	Update VLBA documentation to support 2016B Call for Proposals, perform proposal technical reviews	3/31/2016												
	37	Update VLBA documentation to support 2017A Call for Proposals, perform proposal technical reviews	9/30/2016												
		VLBA Antenna Maintenance													
	38	Tiger Team maintenance campaign to KP	6/30/2016												
	39	Tiger Team maintenance campaign to SC	9/30/2016												
		VLBA Observing Capability Enhancements													
	40	Offer DDC-4 observing with Arecibo on HSA under RSRO program for 2016B	9/30/2016												
		Site Operations													
	41	Renew lease for Pie Town (PT)	12/31/2015												
4.4		**West Virginia Operations**													
		GBT Maintenance													
	1	Beginning of summer painting	6/30/2016												
	2	End of summer painting	9/30/2016												
	3	GBT track inspection will take place, any needed repairs completed	9/30/2016												
	4	2015 structural inspections report complete	6/30/2016												
	5	Begin active surface electronics replacement	9/30/2016												
5.3		**Central Development Laboratory**													
		Repair, Maintenance, Production, Support													
	1	Complete repair of eight Band 6 mixers	9/30/2016										Cancelled		
	2	Define and finalize Band-2 prototype cartridge configuration for final evaluation	12/31/2015												
	3	Complete evaluating Band-2 prototype in the ALMA test cryostat	3/31/2016							Complete with MIC amplifiers, will repeat with MMICs later					
	4	Pending success of foundry run, CRAL evaluation of new MMIC wafer complete	3/31/2016								NCE in effect, due 30 Apr 2017			NCE in effect, due 30 Apr 2017	
	5	Delivery of final band 2 prototype report and project closeout	3/31/2016								NCE in effect, due 30 Apr 2017			NCE in effect, due 30 Apr 2017	
	6	Pending delivery of funding by ASIAA, begin production run of ALMA Band 1 LNAs (NB: this work will continue beyond FY16)	9/30/2016												
	7	Complete RF characterization of a HERA 14 meter dish equipped with modified PAPER dipole feed. This include development of an electromagnetic model, reflection coefficient measurements, and beam maps	12/31/2015												
	8	Complete the refurbishment of 24 PAPER dipole active baluns for use with new HERA antennas	12/31/2015												
	9	Begin development of a new broadband feed for the HERA 14m dish, with electromagnetic simulations and basic construction details	3/31/2016												
	10	Complete cross-coupling measurements for a pair of HERA dishes with modified PAPER dipole feeds via S-parameter and correlation measurements	6/30/2016												
	11	Finish the construction of all three HERA dishes in Green Bank and provide recommendations for improvements to the mechanical design to project	9/30/2016												
	12	Further tests of cross-polarization contributions to Band 2 optics	12/31/2015												
		Research and Development													
	13	Design prototype 35-50 GHz feed horn and phase-shifter for new VLA receiver	12/31/2015					Cancelled							
	14	Measure performance of prototype 35-50 GHz feed horn and phase-shifter for new VLA receiver	6/30/2016							Cancelled see Milestone 5.3.13					
	15	Demonstrate high quality Nb/AlN/NbTiN SIS junctions suitable for THz operation	9/30/2016												

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	16	Resolve suspected packaging/heat sink issues with BAE MHEMT MMICs and conduct further cryogenic tests to see if noise temperature can be improved	3/31/2016												
	17	Develop and test 385 – 500 GHz polarizer	9/30/2016											Cancelled	
	18	Synchronize parallel data streams on an unformatted serial link using FIFO buffering	6/30/2016												
	19	Tapered waveguide calibration of DOMT	9/30/2016												
	20	Fabricate and test 20 low-noise amplifiers for L-band PAF receiver	6/30/2016												
	21	Demonstrate end-to-end digital link with 150 MHz bandwidth, and ability to correlate and beamform on individual channels	9/30/2016												
	22	Redesign and construct expanded Field-of-View L-band PAF receiver	6/30/2016												
	23	Cryogenic research and development on PAFs with large element count. Report	9/30/2016										Cancelled		
	24	Science case for next PAF receiver: white paper and recommendation	6/30/2016												
	25	If new 35nm CRAL wafer run produces competitive Band 2 MMIC chips, another Band 2 MMIC LNA module will be built and cryogenically tested	3/31/2016								NCE in effect, due 30 Sep 2016				
	26	Design and prototype 65-90 GHz amplifier with 2 mil substrate thickness (compare to current 3 mil). Goal is improved reliability and performance reproducibility	12/31/2015										Cancelled		
	27	Design and prototype 75-116 GHz amplifier with 2 mil substrate thickness (compare to current 3 mil). Goal is improved reliability and performance reproducibility	9/30/2016										Cancelled		
	28	Implement advanced topologies and miniaturized packaging of reflectionless filters	3/31/2016												
	29	Implement integrated mm-wave CW signal source	6/30/2016												
6.5		**Science Support & Research**													
		Telescope Time Allocation (TTA)													
	1	CfP for semester 2016B	3/31/2016												
	2	CfP for semester 2017A	9/30/2016												
	3	SRP and tech review process, semester 2016B	3/31/2016												
	4	SRP and tech review process, semester 2017A	9/30/2016												
	5	TAC meeting for semester 2016A	12/31/2015												
	6	TAC meeting for semester 2016B	6/30/2016												
	7	Update SW tools requirements for TAC support 2016A	12/31/2015												
	8	Update SW tools requirements for PST 2016B	3/31/2016												
	9	Update SW tools requirements for TAC support 2016B	6/30/2016												
	10	Update SW requirements tools for PST 2017A	9/30/2016												
	11	Update documentation for CfP and tools 2016B	3/31/2016												
	12	Update documentation for CfP and tools 2017A	9/30/2016												
		Science User Support (SUS)													
	13	15th Synthesis Imaging summer school	6/30/2016												
	14	ALMA cycle 4 CDE planning	6/30/2016												
	15	NAASC sponsored science workshop	12/31/2015												
	16	Testing of version 2 of PPI and NRAO archive	3/31/2016												
	17	Testing/validation of CASA pipeline	9/30/2016												
	18	Summer student selection	3/31/2016												
	19	Summer student offers	3/31/2016												
	20	Summer student program begins	6/30/2016												
	21	Summer student program complete	9/30/2016												
	22	SOS selection begins	9/30/2016												
	23	Update CASAGUIDES	12/31/2015												
	24	Review ALMA user documents	3/31/2016												
	25	Update CASAGUIDES	6/30/2016												
		SSR Support													
	26	Library contracts negotiated	3/31/2016												
	27	Report research time metrics	9/30/2016												
7.4		**Data Management & Software**													
		Data Management & Software													
	1	DMS Review	6/30/2016										Cancelled		
		Scientific Information Services													
	2	XSEDE access	9/30/2016												
		ALMA System Software													
	3	ALMA Fall 2015 Release	12/31/2015												
	4	ALMA Spring 2016 Release	6/30/2016												
		VLA/VLBA System Software													
	5	Deploy software to support Semester 2015B observing	3/31/2016												
	6	Deploy software to support Semester 2016A commissioning	3/31/2016												
	7	Deploy software to support Semester 2016A observing	9/30/2016												
	8	Deploy software to support Semester 2016B commissioning	9/30/2016												
	9	VME Replacement	6/30/2016												
		GBT System Software													
	10	Operations Software Update	9/30/2016												

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	11	Vegas Pulsar Modes	3/31/2016												
	12	NRQZ Software	3/31/2016					Cancelled							
	13	M&C Release	9/30/2016												
	14	GBT Pipeline Improvements	9/30/2016												
	15	Test with PSC	6/30/2016												
		Software Development													
	16	User Portal Redesign	6/30/2016											Cancelled in Q3	
	17	Leverage NGAS for Green Bank data archive	12/31/2015												
	18	Storage upgrade review	3/31/2016												
	19	New NRAO Archive software	3/31/2016												
	20	New NRAO Archive	6/30/2016												
	21	ALMA Cycle 3 Pipeline Release	12/31/2015												
	22	Pipeline Reference Imaging	3/31/2016												
	23	CASA reliability initiative	12/31/2015												
	24	Release CASA version 4.5	12/31/2015												
	25	Release CASA version 4.6	6/30/2016												
	26	Implement PST updates for Semester 2016B Call for Proposals	12/31/2015												
	27	Implement PST updates for Semester 2017A Call for Proposals	6/30/2016												
	28	Implement PHT updates for Semester 2016B TAC Meeting	3/31/2016												
	29	Implement PHT updates for Semester 2017A TAC Meeting	9/30/2016												
	30	Implement OPT updates for Semester 2016A VLA Observing	12/31/2015												
	31	Implement OPT updates for Semester 2016B VLA Observing	6/30/2016												
	32	Tool redesign – deliver design	3/31/2016												
	33	Tool redesign – start development	6/30/2016												
	34	Deliver iOS App for Public Outreach	3/31/2016												
	35	Expand CASA Test Scope	6/30/2016												
8.5		**Program Management Department**													
		Headquarters													
	1	Quarterly Status Updates	12/31/2015												
			3/31/2016												
			6/30/2016												
			9/30/2016												
	2	Program Operating Plan	9/30/2016												
	3	Long Range Plan	9/30/2016												
	4	Annual Progress Summary	9/30/2016												
		New Mexico													
	5	Finalize NM Ops and DMS Training Plan (2nd Phase)	3/31/2016												
	6	PM/SE Implementation Training	6/30/2016												
	7	DMS Group Practices Assessment	12/31/2015												
	8	Implementation of DMS Reporting Tools	9/30/2016												
	9	Host learning session	12/31/2015												
	10	Host learning session	3/31/2016												
	11	Host learning session	6/30/2016												
	12	Host learning session	9/30/2016												
		CDL/ALMA													
	13	PM/SE Training development	12/31/2015												
	14	PM/SE Training development	3/31/2016												
	15	PM/SE Training development	6/30/2016												
	16	PM/SE Training development	9/30/2016												
	17	Facilitate gate review	6/30/2016												
	18	Facilitate gate review	9/30/2016												
	19	Facilitate gate review	12/31/2015												
		Green Bank													
	20	Finalize Training Evaluation Criteria	6/30/2016												
	21	Evaluate and Report on Training Results	9/30/2016												
	22	Host learning session	12/31/2015												
	23	Host learning session	3/31/2016												
	24	Host learning session	6/30/2016												
	25	Host learning session	9/30/2016												
10.3		**Education & Public Outreach**													
		STEM Education and Outreach													
	1	Translation of SJS curriculum to 4H project books complete	3/31/2016												
	2	SJS instructional videos complete	3/31/2016												
	3	Final round of SJS professional development meetings for educators	12/31/2015												
			3/31/2016												
			6/30/2016												
	4	Skynet 2.0 for SJS complete	9/30/2016												
	5	Afterglow 2.0 for SJS complete	9/30/2016											Cancelled	
	6	VLA Visitor/Education Center Education and Interpretive Plan completed	12/31/2015												
	7	VLA Visitor/Education Center architectural schematic designs completed	3/31/2016												
	8	Student interferometer upgrade begins	6/30/2016												

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	9	Interferometer curriculum design	6/30/2016												
	10	STEM Career Day at Dominion Virginia Electric	9/30/2016										Cancelled		
	11	Pocahontas County Science Fair	12/31/2015												
	12	Hour of Code Event	3/31/2016												
	13	USA Science & Engineering Festival	6/30/2016												
	14	10th Grade STEM Day at Piedmont Virginia Community College	9/30/2016										Cancelled		
	15	STEM Career Focus videos	9/30/2016												
	16	Recruit additional SPOT undergraduate ambassadors	12/31/2015												
	17	Additional training for SPOT ambassadors	3/31/2016												
	18	Seek additional SPOT funding	6/30/2016												
		News & Public Information													
	19	WordPress site specified	12/31/2015												
	20	WordPress site design elements completed	3/31/2016												
	21	Orion videos specification and scripts completed	12/31/2015												
	22	Orion videos completed	9/30/2016												
	23	ALMA Explorer filming	3/31/2016												
	24	ALMA Explorer video editing	9/30/2016												
	25	Beta version iOS "RadioSky" app ready for testing	12/31/2015												
	26	RadioSky" app locked, ready for distribution	3/31/2016												
	27	Touchscreen kiosks configuration	9/30/2016												
11.4		**Computing & Information Services**													
	1	Business software review and strategic alignment	3/31/2016												
	2	Initiate migration to Windows 10	9/30/2016												
	3	RHEL 7 Unix OS upgrade	3/31/2016												
	4	Mac OS 10.11 testing	9/30/2016												
	5	Selection of Green Bank phone system	12/31/2015												
	6	Replacement of Green Bank phone system	6/30/2016												
	7	Bro security tool evaluation	6/30/2016												
	8	Bro installation in Green Bank	9/30/2016												
	9	Business services capacity review	3/31/2016												
	10	Review and consolidation of backup solutions	12/31/2015												
12.3		**Diversity**													
		Diversity Council													
	1	Diversity Council Meeting	12/31/2015												
			3/31/2016												
			6/30/2016												
			9/30/2016												
		National/Domestic Outreach													
	2	SEDUIP & PING Program Plan complete	12/31/2015												
	3	SEDUIP Expansion Plan complete	3/31/2016												
	4	LSAMP, AATF, & SYEP Program Plans in place	3/31/2016												
	5	Initiate recruitment activities	12/31/2015												
	6	Summer Program Orientations	3/31/2016												
	7	All summer programs initiated	6/30/2016												
	8	NAC Annual Workshop held	9/30/2016												
		International Outreach													
	9	NINE Program Plan (existing partners) complete	12/31/2015												
	10	NINE Program Plan draft (new partners) complete	3/31/2016												
	11	NINE Program initiated	6/30/2016												
	12	NINE conference held	9/30/2016												
	13	NINE Virtual Classrooms/Learning Venues Program Plan developed and implemented	12/31/2015												
			3/31/2016												
			6/30/2016												
			9/30/2016												
		Diversity and Cultural Awareness													
	14	DCA Program Plan developed and implemented	12/31/2015												
			3/31/2016												
			6/30/2016												
			9/30/2016												
13.7		**Human Resources**													
		Training & Development													
	1	Deliver two new Management/Supervisor development courses: 1. Performance Management, and 2. Comp 101	3/31/2016												
	2	Design Generational Workplace Strategies Training	9/30/2016												
		Compensation													
	3	Annual Performance Review Process	12/31/2015												
	4	All preparations complete and salary review worksheets are open to pay decision managers for final merit review decisions	3/31/2016												
	5	FLSA regulation changes anticipated and analyzed	3/31/2016												
	6	Participate in all credible/scheduled salary survey sources and conduct analysis of benchmark jobs	9/30/2016												
		Benefits													

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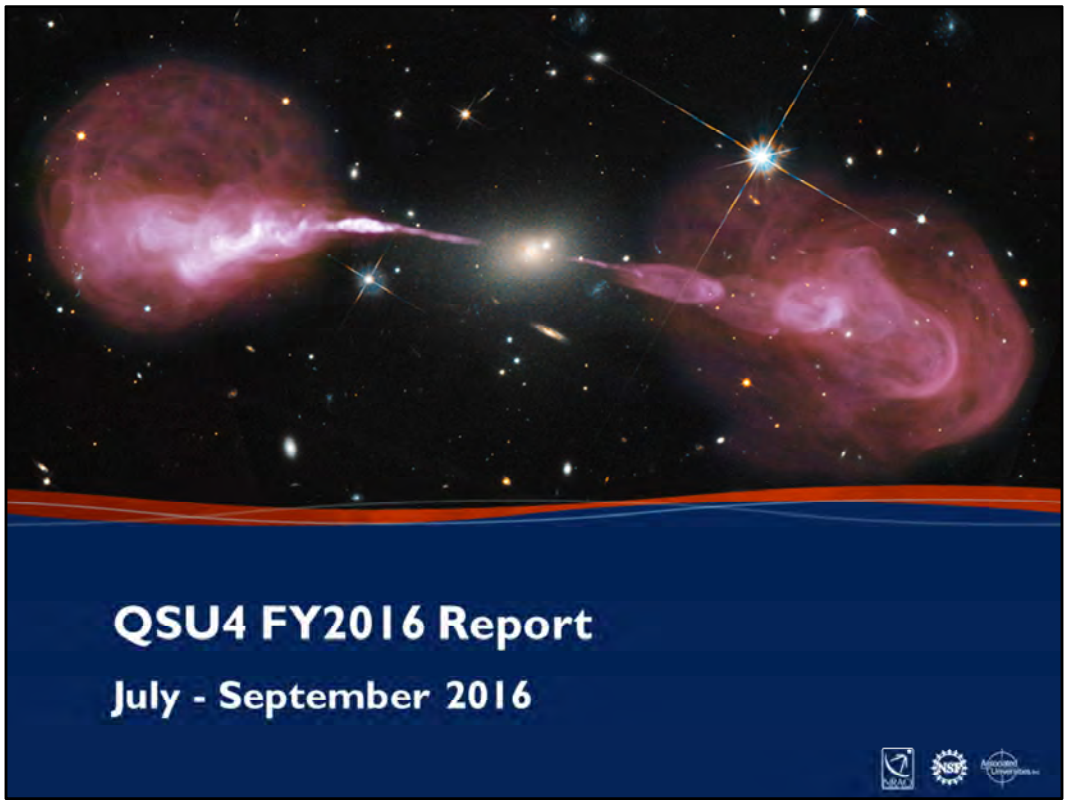
	7	HR prepares and distributes all open enrollment materials to employees and makes enrollment changes into JDE and with vendors	12/31/2015												
	8	Benefits programs for critical illness, accident and LT care voluntary benefits	12/31/2015												
	9	Assistance program for NRAO employees and retirees for hardship or catastrophic events	3/31/2016												
	10	Alternative solutions for under 65 retiree population	6/30/2016												
		Recruitment and Employment													
	11	Design and implement a comprehensive recruitment toolkit for hiring managers	12/31/2015												
	12	Assess current applicant tracking system and determine need and/or feasibility for improved system	3/31/2016												
	13	Implement an Observatory-wide On-Boarding program	3/31/2016												
		Human Resources													
	14	Evaluate/refine/expand the process	6/30/2016												
	15	Employee Climate Survey Design and Delivery	6/30/2016												
14.1		**Communications**													
		Science Communications													
	1	Update Research Facilities brochure	12/31/2015												
	2	Submit 2017 AAAS science symposium proposal	6/30/2016												
	3	Publish 2015 NRAO Annual Report	9/30/2016												
15.7		**Administration**													
		Business Services													
	1	Complete and test new chart of accounts. Provide training	9/30/2016												
	2	Review balances in CSA and SPO Accounts and prepare for closing	9/30/2016												
	3	Familiarization with new Cooperative Agreement (if awarded) and preparation for budget loading	9/30/2016												
	4	Separate and balance Green Bank and VLBA accounts	9/30/2016												
		CAP													
	5	Update manual. Review and approval by Assoc. Director of Administration. Training	3/31/2016												
	6	Update manual. Review and approval by Assoc. Director of Administration and AUI	6/30/2016												
		ES&S													
	7	Determine technical solution to Safety Recordkeeping requirements	12/31/2015												
	8	Complete ES&S supervisory training	6/30/2016												
		MIS													
	9	Load and testing of new Chart of Accounts	9/30/2016												
	10	Prepare list of possible improvements, upgrades and additions Calculate effort, cost, and benefit of each change.	3/31/2016												
		TTO													
	11	Identify from IP Asset Register, review choices through selection committee, begin commercialization efforts.	9/30/2016												
	12	Prepare follow-up program based on prior year agenda	6/30/2016							Cancelled					
16.5		**Spectrum Management**													
		Spectrum Management													
	1	ITU-RWRC-15	12/31/2015												
		WV Radio Quiet Zone													
	2	WV Radio Quiet Zones	3/31/2016												
17.1		**Director's Office**													
		ALMA													
	1	ALMA Board Meeting	12/31/2015												
			3/30/2016												
			6/30/2016												
			9/30/2016											Cancelled	
	2	ALMA Director's Council	12/31/2015												
			3/30/2016												
			6/30/2016												
			9/30/2016												
		Corporate Meetings													
	3	AUI Board of Trustees meetings	12/31/2015												
			3/30/2016												
			6/30/2016												
	4	AUI Executive Committee meetings	12/31/2015												
			6/30/2016												
			9/30/2016												
	5	AUI Visiting Committee meeting	6/30/2016												
		Science Community													
	6	Appoint new Users Committee members	12/31/2015												
	7	Users Committee meeting	6/30/2016												
		Management Review													
	8	NSF Annual Program Review	12/31/2015												
	9	All Hands presentation	12/31/2015												
			6/30/2016												


QSU4 FY2016 Report
July - September 2016

Annual POP Score Card

Total number of 2016 POP Milestones: 311
Total 2016 milestones completed on time: 265
Percent of total completed on time: 85.21%
Total completed in the year 2016:284
Percent of total completed in the year: 91.32%
Total moved to next year 2017:12
Percent of total postponed to next year: 3.86%
Total 2016 milestones cancelled:15
Percent of total 2016 milestones cancelled: 4.82%

POP MILESTONE # 2.6.16

ALMA Development: B3 CCA Deflux

Complete FY14/FY15 Development Projects

Cost
Schedule
Scope

COST:

- Total budget $137,600
- Total cost $137,600

SCOPE:

In-situ verification test plan developed and submitted to JAO.

Software script for heater control complete.

SCHEDULE: (no-cost extension)

Milestone	Schedule	Target
1.Verification test	06/01/16	01/30/17

RISK & MITIGATION:

Risk	Mitigation
1.Verification test failure	TBD

3 QSU4 FY2016

COST: On budget.

SCOPE: HIA highly confident that the corrective action (heater) will remedy the accumulated flux problem. Uncertain about heater efficacy in solving the total power variation (as a function of azimuth) problem since they are unable to simulate AOS magnetic field variations in their laboratory. (Allen Variance specification)

SCHEDULE: B3 CCA Unit No. 33 has been modified and installed into FE 43. FE 43 installed in PM-03. Verification Test plan submitted to JAO; waiting on JAO ADE to schedule and conduct verification test.

RISK & MITIGATION: HIA has not developed a contingency plan.

POP MILESTONE # 2.6.16

ALMA Development: Fiber Optic Project

Complete FY14/FY15 Development Projects

Cost
Schedule
Scope

COST:

- Total budget $1,849,001
- Total cost $1,824,161
- Balance $ 24,840

SCOPE:

ALMA Fiber Optic communications network if fully functional.

SCHEDULE: (no-cost extension)

Milestone	Schedule	Target
1. Operating permit	12/31/13	12/31/16

RISK & MITIGATION:

Risk	Mitigation
1. Continued delay postpones Project close-out and settlement of accounts	1a. Temporary operating permit issued by *Bienes Nationales in May*; bank guarantees renegotiated in September 1b. Microwave back-up system is fully functional

4 QSU4 FY2016

COST: Construction completed with a positive variance of $24,840.

SCOPE: Planned Project scope has been accomplished.

SCHEDULE: Chilean National Government *(Biennes Nationales)* issued a temporary operating permit on 24 May 2016.

RISK & MITIGATION: Continued delay imposes a financial hardship on the fiber optic contractor (Silica) is contractually obliged to maintain the back-up microwave system until the Operating Permit is issued. Silica and AUI re-negotiated Silica's bank guarantees (cost avoidance to Silica). AUI agreed to suspend any penalties provided the FO link is continues to be and the bank guarantees are kept valid.

POP MILESTONE # 2.6.16

ALMA Development: B2 Prototype Cartridge

Complete FY14/FY15 Development Projects

Cost
Schedule
Scope

COST:

- Total budget $1,493,969
- Total cost $1,109,947
- Balance $ 384,022

SCOPE:

Measured receiver noise temperatures using the CRAL MMIC CLNAs are commensurate with expected results

SCHEDULE: (no-cost extension)

Milestone	Schedule	Target
1. 1st generation amplifier modules	08/31/16	Complete
2. 2nd generation amplifier modules	02/31/17	
3. Project close-out	03/31/17	

RISK & MITIGATION:

Risk	Mitigation
1. Insufficient cryogenic MMICs for construction phase	1. 2nd wafer run in work

5 QSU4 FY2016

COST: Anticipating a positive variance at complete.

SCOPE: Planning on a Preliminary Design Review in Q2 FY2017.

SCHEDULE: Operating per a no-cost extension until 03/31/17.

RISK & MITIGATION: CRAL producing an second wafer run.

POP MILESTONE # 3.4.13

NM OPS

Replace one antenna azimuth bearing

COST:

Labor Actuals	Expected
$0	$0
Material Actuals	**Expected**
$60K	$60K
Travel Actuals	**Expected**
$0	$0

SCOPE:

One VLA antenna per year will have its azimuth bearing replaced.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
1. Replace one antenna azimuth bearing	9/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation
1. Low risk to damage of equipment, unless we fail to perform this PM for several years	1. Regularly test for bearings which have the highest susceptibility to damage, and prioritize accordingly

6 QSU4 FY2016

COST: No cost overrun. An azimuth bearing costs $60K. We currently have three spare bearings on hand, while more are funded in the outlying years of the infrastructure improvement plan that was described in the AUI re-competition proposal.

SCOPE: One antenna azimuth bearing will be replaced each year. This is considered preventive maintenance. The antenna selected for bearing replacement is determined by inspections of the bearing's grease.

SCHEDULE: An unexpected diversion of resources happened in FY16 due to the need for the extra Tiger Team campaign to St. Croix. Additionally, the VLA overhead crane failed, which limited our window of opportunity for a bearing replacement. The crane will be repaired in Q1 FY17. Meeting the bearing replacement schedule is not critical from a safety or operations view, unless a bearing is not replaced for multiple years. Therefore, this milestone will be cancelled.

RISK & MITIGATION: Bearing grease is monitored on a regular basis. The risk to equipment damage would be increased if we were unable to replace bearings for several years in a row, and this risk would be that, should one antenna fail and have to have it's bearing replaced immediately, this would divert resources from other VLA maintenance activities until the inoperable bearing was replaced.

POP MILESTONE # 3.4.17

NM OPS

Replace five antenna pad intersections

Cost
Schedule
Scope

COST:

Labor Actuals	Expected
$0	$0
Material Actuals	**Expected**
$16K	$16K
Travel Actuals	**Expected**
$0	$0

SCOPE:

The legacy wooden antenna pad intersections are aging and becoming unreliable. The 73 total intersections are to be replaced with a stronger concrete design at a rate of five per year.

SCHEDULE:

Milestone	Schedule	Target
1. Replace five intersections in FY16	9/30/2016	12/23/2016

RISK & MITIGATION:

Risk	Mitigation
1. If a key intersection is not replaced, this could lead to a delay in an array reconfiguration	1. Prioritize the intersection replacements so that the worst ones are repaired first and that intersection replacements do not interfere with array reconfigurations

7 QSU4 FY2016

COST: No cost overrun exists. Budgetary constraints in FY16 led to the freezing of one open track crew position. Note that this position was unfrozen at the beginning of FY17.

SCOPE: Explained on slide.

SCHEDULE: Five intersections are to be replaced each year. In FY16, three intersections were successfully replaced, while the components for two more were constructed. The two remaining intersections must be installed. These will be completed by the end of December 2016. It is our intention to catch up to the schedule by installing five additional (seven total) intersections in FY17. The success of this goal depends in part on quickly filling the vacant position on the track crew.

RISK & MITIGATION: The short term risk of not meeting this goal does not pose immediate safety concerns. When transporting an antenna, we are very careful to not subject the transporter to a dangerous intersection. In the case where an intersection is determined to be unsafe, the transporter will back off while the track crew is summoned to shore up the intersection. The real risk lies in falling behind schedule. VLA intersections are old and their rate of deterioration is increasing. The more we get behind in replacing the intersections, the more chance we have of delaying antenna configuration changes. As of the end of FY16, we have replaced 28 of the 73 intersections.

POP MILESTONE # 3.4.31

NM OPS

Continuous Slew Tipping Scans

Cost
Schedule
Scope

COST:

Budget Actual	Budget Planned

There are no changes in budget.

SCOPE:

For those VLA observations where an estimate of atmospheric opacity is needed a tipping scan can be used to derive this quantity. We have implemented old-style "stepped" tipping scans, but they are inefficient, taking longer than needed. "Continuous slew" tipping scans are much faster and so preferred.

SCHEDULE:

Milestone	Schedule	Target
1. System implementation	03/31/2016	12/31/16
2. Post processing heuristics defined	03/31/2016	03/31/17

RISK & MITIGATION:

Risk	Mitigation
1. Continuous slew tipping scans have taken longer than planned to implement and so users continue to use correlations between weather data and opacities derived some years ago, with the associated increase in the uncertainty in the absolute flux density scale.	1. The mitigation of this problem is for users to ensure they observe their flux density calibrator at a similar elevation as their source

8 QSU4 FY2016

COST: N/A

SCOPE: N/A

SCHEDULE: Stepped tips are already supported in the OPT, and while continuous slew tips are properly supported in the low-level online software, it is not yet possible to set them up in the OPT. Requirements have been written for the necessary changes, but this work is lower priority within DMS than the new archive tool, and has been delayed by the late delivery of the new archive tool. In addition, post-processing software is still needed. It is now expected that the OPT work will take place in Q1 FY2017. The post-processing heuristics will be defined by the end of Q2 FY2017. Note that both these goals will be tracked separately in the FY2017 Program Operating Plan.

RISK & MITIGATION: In the absence of the ability to use tipping scans users will continue to use the correlations between weather data and opacities derived some years ago for the old VLA, with the associated increase in the uncertainty in the absolute flux density scale. The mitigation of this problem is for users to ensure they observe their flux density calibrator at a similar elevation as their source. Advice for observers is incorporated in the "calibration" section of the online "Guide to Observing with the VLA".

POP MILESTONE # 5.3.1

Central Development Lab

Complete repairs of eight Band 6 mixers

COST:

Labor Actuals	Expected
Material Actuals	Expected
Travel Actuals	Expected

SCOPE:

As explained in the notes, scope of this effort was modified and this milestone is no longer relevant.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
Repair 6 mixers	9/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation
ALMA Band 6 preamp/mixer stock levels	Accept: Currently producing sufficient levels to maintain ALMA stock requirements.

9 QSU4 FY2016

SCOPE: A large number of mixer-preamplifiers were refurbished, but no new mixers were qualified for use in Band 6 cartridge repair work. A change in the unspecifiable (but significant) cryogenic parameters of both amplifier passive components and HFETs obtained after the construction era batch of components were exhausted rendered the existing design unrepeatable to consistently meet ALMA specifications. Rather than devote additional effort to re-optimize the MIC based "chip and wire" amplifier design, possible alternatives (preferably commercial) were explored. An MMIC based cryogenic amplifier from Low Noise Factory was identified as a drop-in replacement (some customization was required and performed by the vendor) for the mixer preamplifier work and an initial batch of 10 units were ordered. The gain response of the MMIC amps is flatter than the MIC versions, so equalizers were designed during the period to pre-distort the gain slope to compensate for equalizers in latter stages of the receivers. Initial test results show promising mixer-preamplifier performance suitable for cartridge repair work.

Significant progress was made in identifying and qualifying an alternate path to build compliant mixer-preamplifiers while producing sufficient devices to meet the ALMA offsite hardware support needs to keep up with the necessary Band 6 cartridge maintenance work.

This new scope (redesign based on custom commercial LNF CLNA) is already covered by a separate stand-alone POP2017 milestone. Consequently, this milestone is now unnecessary.

SCHEDULE: See above.

POP MILESTONE # 5.3.17

Central Development Lab

Develop and test 385-500 GHz polarizer

COST:

Labor Actuals	Expected
Material Actuals	Expected
Travel Actuals	Expected

SCOPE:

As explained in the notes, scope of this effort was modified and this milestone is no longer relevant.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
Finish development of Polarizer.	9/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation
No major risk, just limited labor resources.	Accept:Will continue effort when resource availability returns. Does not delay any other project.

10 QSU4 FY2016

SCHEDULE: Given other E&M development work, the priority of this project was lowered, and this work will be taken up next year, as time permits. It is being cancelled as a POP milestone since it is not critical work and the priority is low.

RISK & MITIGATION: This is an internal CDL R&D effort, that will be applicable towards a future project. While having it done this FY would have put us ahead, yet not having accomplished it does not delay any ongoing project.

POP MILESTONE # 5.3.23

Central Development Lab

Cryogenic research & development on PAFs with large element count

COST:

Labor Actuals	Expected
Material Actuals	Expected
Travel Actuals	Expected

SCOPE:

Internal efforts refocused.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
Final Report	9/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation

11 QSU4 FY2016

SCOPE: This milestone was to report on study of future possibility of large element count configurations. When it became clear mid-year that there was no desire to pursue this, we changed focus to higher frequency (that effort will still be reported upon when ready), and consequently work on this milestone was abandoned. Can be re-scoped in a future POP, if necessary, request cancelation for now cancelled.

POP MILESTONE # 5.3.26

Central Development Lab

Design and prototype 65-90 GHz amplifier with 2 mil substrate thickness

COST:

Labor Actuals	Expected
Material Actuals	Expected
Travel Actuals	Expected

SCOPE:

As explained in the notes, scope of this effort was modified and this milestone is no longer relevant.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
Design & Prototype	12/31/2015	Cancelled

RISK & MITIGATION:

Risk	Mitigation

12 QSU4 FY2016

SCHEDULE: Design completed / prototype development indefinitely delayed. With the progress of MMICs and their promising performance, we do not anticipate the need of these amplifiers for the ALMA Band 2 project. Also NRAO/JPL MOU does not cover CDL access to cryo3 30 micron wide devices on which this design is based. Remaining chips are reserved for future repairs of currently deployed amplifiers which use this chip variant.

POP MILESTONE # 5.3.27

Central Development Lab

Design and prototype 75-116 GHz amplifier with 2 mil substrate thickness

COST:

Labor Actuals	Expected
Material Actuals	Expected
Travel Actuals	Expected

SCOPE:

As explained in the notes, scope of this effort was modified and this milestone is no longer relevant.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
Design & Prototype	9/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation

13 QSU4 FY2016

SCHEDULE: This was (is) an internal CDL development to produce useful HEMT based amplifiers operating up to 115 GHz. Design completed / prototype development indefinitely delayed. With the progress of MMICs and their promising performance, we do not anticipate the need of these amplifiers for the ALMA Band 2 project. Also NRAO/JPL MOU does not cover CDL access to cryo3 30 micron wide devices on which this design is based. Remaining chips are reserved for future repairs of currently deployed amplifiers which use this chip variant.

POP MILESTONE #6.5.17

Science Support & Research

Testing/Validation of CASA Pipeline

Cost
Schedule
Scope

COST:

Labor Actuals	Expected
$	$
Material Actuals	**Expected**
$	$
Travel Actuals	**Expected**
$	$

SCOPE:

Test and validate CASA pipeline against scripted pipeline.

SCHEDULE:

Milestone	Schedule	Target
1. Testing and validation of polarization calibration implemented.	09/30/16	Mid-FY17
2. Implementation in the CASA pipeline	09/30/16	Q1 FY18

RISK & MITIGATION:

Risk	Mitigation

14 QSU4 FY2016

COST: N/A

SCOPE: The milestone refers to implementation, testing, and validation of polarization calibration in the pipeline. The CASA pipeline was released with CASA 4.7 and, while heuristics for both ALMA and VLA polarization calibration were developed by Q4 in FY2016, they were not implemented in the CASA pipeline. Current expectations are that polarization calibration will not be implemented in the CASA pipeline until Q1 FY2018. The testing and validation effort will therefore occur in Q3/Q4 FY2017.

SCHEDULE: Testing and validation of the CASA pipeline for VLA pipeline processing of polarization calibration is delayed until mid-FY2017. Implementation in the CASA pipeline is expected to be in Q1 FY2018.

RISK & MITIGATION: The testing/validation effort is dependent on the CASA pipeline development schedule.

POP MILESTONE # 7.4.1

DMS

DMS Review

COST:

Labor Actuals	Expected
DMS funds this activity at a higher WBS level.	
Material Actuals	Expected
$	$
Travel Actuals	Expected
$	$

SCOPE:

The DMS review will focus on Science Ready Data Products (SRDP).

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
1. DMS Review	6/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation

15 QSU4 FY2016

COST: DMS funds this activity at a higher WBS level. Costs are not tracked for this milestone.

SCOPE: The DMS review will focus on Science Ready Data Products (SRDP).

SCHEDULE: The review is planned to focus on SRDP and will be scheduled approximately 6 months after the arrival of the new SSR lead. The following has been included in the FY17 POP in the SSR section: "In collaboration with DMS, SRDP requirements will be developed in Q1 and Q2. The project plan and schedule will be developed in Q2 and Q3. The project will be reviewed at the end of Q3 and launched in Q4." This milestone is cancelled, and is replaced by the SRDP project review in FY17.

RISK & MITIGATION: N/A

POP MILESTONE # 7.4.20

DMS

New NRAO Archive

Cost
Schedule
Scope

COST:

Labor Actuals	Expected
DMS funds this activity at a higher WBS level.	
Material Actuals	Expected
$	$
Travel Actuals	Expected
$	$

SCOPE:

Operationalize the New NRAO Archive and RPI previously prototyped – Step 2: Release software to users.

SCHEDULE:

Milestone	Schedule	Target
1. Release Phase 2 v 2.0 for testing		Complete
2. Release v 2.5 to users	6/30/2016	1/30/2017

RISK & MITIGATION:

Risk	Mitigation
1. Contention for resources (people)	1a. Continue to augment team. 1b. Monitor progress of work and prioritize competing priorities.

16 QSU4 FY2016

COST: DMS funds this activity at a higher WBS level. Costs are not tracked for this milestone.

SCOPE: Operationalize the New NRAO Archive and RPI previously prototyped – Step 2: Release software to users.

SCHEDULE: Project is recovering from competition with operational priorities and difficulty in hiring resources over the long term. A focus on this project as the top priority over the last six months has led to significant progress. An initial test version was released in Q3 quarter, and a second release given internal users in Q4 and to a subcommittee of the NRAO User's Committee in early November. A release which is functionally equivalent to the current archive, but with a greatly improved interface, better performance, and inclusion of ALMA data, is planned for 1/30/2017. These dates have slipped from those published in Q3 due to the discovery during testing of the need to re-design the metadata database to handle particular use cases.

RISK & MITIGATION: The risk of low performance of ALMA retrievals has been retired via a recent release of the ALMA archive software which allows more granular response to queries.

The primary risk is to the schedule due to other priorities in scope for the team. The AAT/RPI work was scheduled to ramp down on an earlier timescale, and since it hasn't this puts pressure on other delivery commitments, such as the PST revision and redesign work. Two new positions have been filled in the last six months to help provide capacity, and two additional are planned. We will continue to monitor and prioritize work across the team.

POP MILESTONE # 7.4.33

DMS

Tool redesign – start development

Cost
Schedule
Scope

COST:

Labor Actuals	Expected
DMS funds this activity at a higher WBS level.	
Material Actuals	Expected
$	$
Travel Actuals	Expected
$	$

SCOPE:

Start work to modify NRAO's observing tools (particularly the PST/OPT/PHT) based on recent review of design and development direction.

SCHEDULE:

Milestone	Schedule	Target
1. Start development	6/30/2016	9/1/2016

RISK & MITIGATION:

Risk	Mitigation
1. Resources not available due to competing efforts (AAT,VLASS).	1a. Continue to monitor competing needs. 1b. Add resources to team.

17 QSU4 FY2016

COST: DMS funds this activity at a higher WBS level. Costs are not tracked for this milestone.

SCOPE: Start work to modify NRAO's observing tools (particularly the PST/OPT/PHT) based on recent review of design and development direction.

SCHEDULE: Resources for this project were assigned to the higher-priority AAT/RPI project. Work on the first improvements to the PST, including removal of sessions and high-priority User Committee requests missed the target start date, but did start in mid-October (re-allocated Rafael Hiriart to do the development).

RISK & MITIGATION: Resource (people) availability may be limited due to competing efforts, such as continuing work on the AAT/RPI and VLASS. The effort needed to complete these projects is being monitored, and additional resources are being added to the team.

POP MILESTONE # 10.3.5

EPO

Afterglow 2.0 for SJS Complete

COST:

Labor Actuals	Expected
$ Funded via	$ Departmental budget
Material Actuals	Expected
$	$
Travel Actuals	Expected
$	$

SCOPE:

Deliverable software is actually the responsibility of North Carolina Chapel Hill.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
1. Software upgrade	9/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation

18 QSU4 FY2016

COST: N/A

SCOPE: This software upgrade was a part of the cooperative SJS program and the software was not an NRAO deliverable but was to be done by our partner, University of North Carolina – Chapel Hill.

SCHEDULE: N/A

RISK & MITIGATION: N/A

POP MILESTONE # 10.3.7

EPO

VLA VC Upgrade Architectural/Design Plan

Cost
Schedule
Scope

COST:

Labor Actuals	Expected
No changes	
Material Actuals	**Expected**
$42,581 /year	$2,750 / year
Travel Actuals	**Expected**
No changes	

SCOPE:

Schematic design drawings for upgrades to the VLA VC buildings and landscape.

We have parking lot and new road plans, so far. Meetings with architects last week in July to choose one and schedule phase one specification documentation. Further progress in FY17 is contingent upon fundraising.

SCHEDULE:

Milestone	Schedule	Target
1. VLA VC architectural plan	03/30/16	3/30/17

RISK & MITIGATION:

Risk	Mitigation
1. No seed funds to hire contractor.	1. Mitigate by holding off other expenditures to prioritize this one.

19 QSU4 FY2016

COST: EPO funds this activity at a higher WBS level unless outside funding is acquired for it.

SCOPE: An architect or general contractor is required to survey the site and prepare a detailed building plan for the proposed upgrades to both indoor and outdoor features.

SCHEDULE: New idea has received approval from the Director. We have a plan for the new roads and parking lot construction aspects of the upgrade, but not the VC and classroom upgrades, or the landscaping. We have made preliminary contacts for initial walkthroughs, and have funding set aside to cover the initial specification documents. Two meetings with NM-based architects were planned for last week in July 2016. It doesn't appear that they were ever done. They are now in the FY17 POP for Q1 (EPO 8.3.18), but I would like to move them to Q2

RISK & MITIGATION: If no seed funds are available to hire the architect, then we shuffle around other budget priorities to scrape the funds together.

POP MILESTONE # 10.3.10

EPO

STEM Career Day at Dominion Virginia Electric

COST:

Labor Actuals	Expected
$ Funded via	$ Departmental budget
Material Actuals	Expected
$	$
Travel Actuals	Expected
$	$

SCOPE:

This milestone is cancelled, missed opportunity, this was not scheduled under the previous EPO AD.

SCHEDULE:

Milestone	Schedule	Target
1. STEM Career Day	9/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation

20 QSU4 FY2016

COST: N/A

SCOPE: Milestone cancelled, missed opportunity, this was not scheduled under the previous EPO AD

SCHEDULE: N/A

RISK & MITIGATION: N/A

POP MILESTONE # 10.3.14

EPO

10th Grade STEM Day at PVCC

COST:

Labor Actuals	Expected
$ Funded via	$ Departmental budget
Material Actuals	Expected
$	$
Travel Actuals	Expected
$	$

SCOPE:

Event is actually scheduled in Nov 2016, at which time EPO does not have resources to support the event.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
1 Stem Career day	9/30/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation

21 QSU4 FY2016

COST: N/A

SCOPE: Milestone cancelled. This milestone was defined under the previous EPO AD. The actual event (Nov 2016) is beyond FY16 and does not align with POP milestone date (complete by 9/30/2016). EPO does not have resources available to support the event on the November 2016 date.

SCHEDULE: N/A

RISK & MITIGATION: N/A

POP MILESTONE #14.1.3

Communications

Publish 2015 NRAO Annual Report

Cost
Schedule
Scope

COST:

Labor Actuals	Expected
$	$
Material Actuals	Expected
$	$
Travel Actuals	Expected
$	$

SCOPE:

SCHEDULE:

Milestone	Schedule	Target
1. Annual Report	9/30/16	12/31/2016

RISK & MITIGATION:

Risk	Mitigation

22 QSU4 FY2016

COST: N/A

SCOPE: N/A

SCHEDULE: Unanticipated tasks related to hiring a new Assistant Director for Education & Public Outreach (AD-EPO) – chairing the Search Committee, and functioning as the interim AD-EPO – delayed completion of the 2015 Annual Report.

RISK & MITIGATION: N/A

POP MILESTONE # 17.1.1

Director's Office

ALMA Board Meeting Telecons

COST:

Labor Actuals	Expected
$	$
Material Actuals	**Expected**
$	$
Travel Actuals	**Expected**
$	$

SCOPE:

The ALMA Board has done away with scheduled telecons, and they will be scheduled on an ad hoc basis if necessary. The change was made April 2016.

This milestone is cancelled.

SCHEDULE:

Milestone	Schedule	Target
1. Telecom	09/2016	Cancelled

RISK & MITIGATION:

Risk	Mitigation

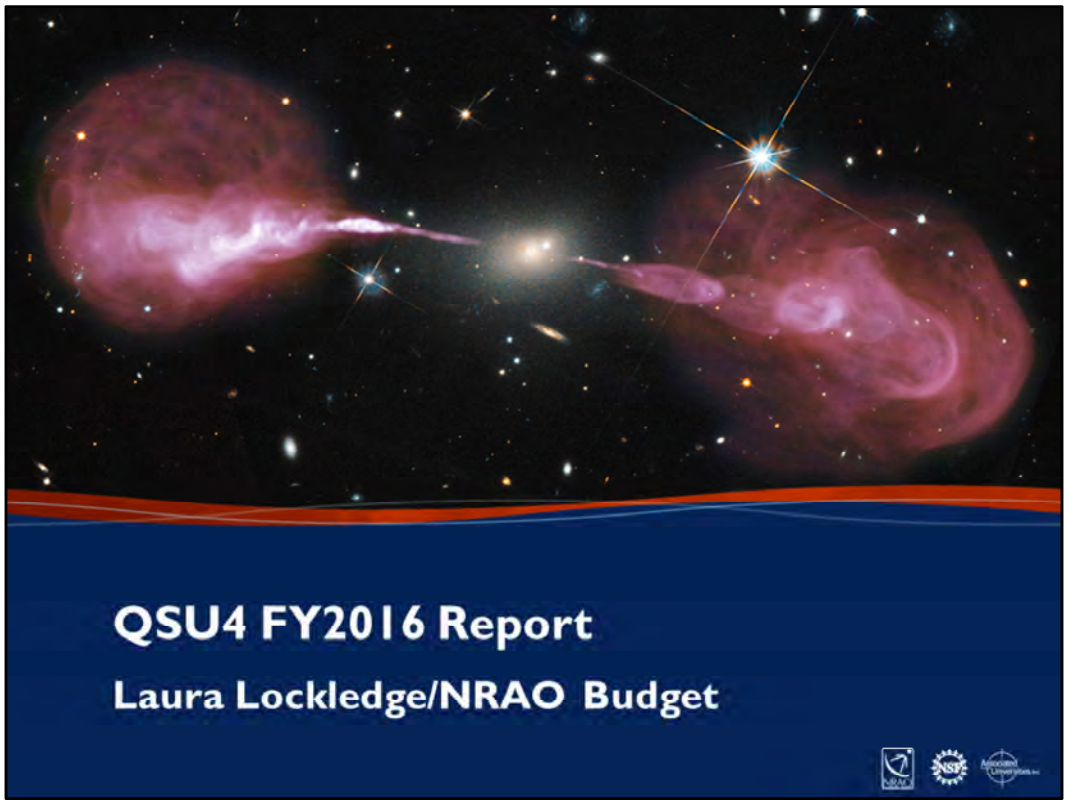
23 QSU4 FY2016

COST: N/A

SCOPE: N/A

SCHEDULE: The ALMA Board has done away with scheduled telecons, and they will be scheduled on an ad hoc basis if necessary. The change was made April 2016. This milestone is cancelled.

RISK & MITIGATION: N/A


QSU4 FY2016 Report
Laura Lockledge/NRAO Budget

Overall Status

Today's information is preliminary.

- Benefits finished the year @ 36.6% vs. budget of 35.6%. Excess costs distributed equitably among the fund sources.
- Met GBO carryforward targets.
- CSA-1 fully exhausted.
- CSA-2 still funds remaining for deobligation/reobligation at end of 90 day closeout period.
- ICC under-recovered.
- Three year ICC closeout being distributed equitably among the fund sources (not reflected in these figures).

FY16 YTD by Major WBS Category

NRAO Ops – Q4

	FY16 POP Budget	FY16 Rev. Budget	FY16 YTD Expenses	YTD % Rev Budget
NSF	41,730	41,730	41,730	100.0%
Telescope Time Sale	3,596	3,596	3,697	102.8%
Carryforward/Other	3,138	4,509	4,555	101.0%
Total CSA-1 Revenues	**48,464**	**49,835**	**49,981**	100.3%
Telescope Ops	18,723	19,916	19,159	96.2%
Development	3,535	3,435	3,297	96.0%
Science Ops	5,860	6,287	5,583	88.8%
Admin Services	15,168	15,233	16,235	106.6%
Director's Office	3,677	3,772	3,718	98.6%
FY16, Total	**46,964**	**48,643**	**47,992**	**98.7%**
FY16 CSA-1 Net	**1,500**	**1,191**	**1,989**	

- Plurality of telescope time sale revenue is associated with the Breakthrough Listen project, time did not begin until January.
- Difference between Carryforward Budget & Revised is open commitments.
- Director's Office includes fund source adjustments of $239K

FY16 YTD by Major WBS Category

ALMA Ops – Q4

	FY16 POP Budget	FY16 Rev. Budget	FY16 YTD Expenses	YTD % Rev Budget
Telescope Ops	22,851	23,424	18,558	79.2%
Development	5,478	8,516	2,420	28.4%
Science Ops	7,204	8,172	7,160	87.6%
Admin Services	5,013	5,029	4,919	97.8%
Director's Office	3,447	3,503	3,159	90.2%
FY16, Total	**43,993**	**48,644**	**36,216**	74.5%
Development Reserve	4,073			
Open Commits	3,521			
C/F for FY16 Fuel	1,800			
C/F for Future Years	231	1,931		
PPS Budget Adjustment	(714)			
JAO Budget Adjustment	(531)			
Development	(1,400)			
NAOJ	136			
Canada (net)	(534)			
August Decommit	(12,385)	(12,385)		
ALL ALMA Resources	38,190	38,190	36,216	94.8%

ALMA Ops – Q4, con't.

- Development awarded $1.1M in studies, Q1
- Telescope Ops rec'd $2.1M credit from NAOJ for FY16 activity.
- Below the line changes result of NSF changes in funding timing vis a vis JAO and designation of use of Canadian funds.
- Director's Office includes fund source adjustments of $90K.
- Deobligation of $12.385M in Q4 – reobligated to FY17, anticipate add'l ~$2.0M.

FY16 YTD by Major WBS Category

ICC – Q4

	FY16 POP Budget	FY16 Rev. Budget	FY16 YTD Expenses	YTD % Rev Budget
Telescope Ops	101	102	91	89.1%
Development	713	726	868	119.7%
Science Ops	1,924	1,951	1,874	96.1%
Admin Services	11,004	11,405	11,381	99.8%
Director's Office	1,514	1,563	1,580	101.1%
FY16, Total	**15,256**	**15,746**	**15,794**	100.3%
Admin Recoveries	**13,938**	**14,428**	**14,259**	98.8%
External Recoveries	**1,318**	**1,318**	**1,354**	102.7%
FY16 ICC Net	**0**	**0**	**180**	

- ICC under-recovered by $180K due to lagging spend in CSA-2, add'l benefits expenses, AD overlaps.
- $90K fund source adjustments shown in Director's Office.

Emerging Issue

Benefits Expenses

- FY16 Benefits overage ($463K) able to be accommodated by CSA's; contributes to under-recovery of ICC.
- FY17 benefits budgeted at 36% - using actuarial estimate. Significant increases to employee costs (increases ranging from 9.7% to 46.1%) to meet this budget.

Closeout Matters

GBO Carryforward

Source	$K
Breakthrough Actual, FY16	1,494
GBO Transition $, Balance	247
GB Open PO's	58
GBO Structural Inspection	175
NanoGrav Shortfall, FY16	(198)
GB Carryforward	1,776

Closeout Matters

ICC Closeout

- NRAO first used the internal common cost (ICC) mechanism in FY14.
- Pool has run for three years (14,15,16).
- Closing out the pool to all open fund sources to enable clean opening for the NICRA version in FY17.
- Total adjustment expected to be <$50K.

FY15 POP Milestones

POP MILESTONE # FY15 3.4.8

NM OPS

Automate Subarray Observing

Cost
Schedule
Scope

COST:

Budget Actual	Budget Planned

There are no changes in budget.

SCOPE:

Observations using multiple VLA subarrays have been done by hand since FY2014.

This mode will be automated and incorporated into the dynamic scheduler for testing by the end of Q1 FY17.

SCHEDULE:

Milestone	Schedule	Target
1 subarray observing "by hand"	3/31/2014	3/31/2014
2 subarray observing automation	9/30/2016	12/31/2016

RISK & MITIGATION:

Risk	Mitigation
1 Slightly reducing user chances to observe priority C (filler projects)	VLA scheduler vigilance
2 Delay other observatory activities caused by effort being used for manual scheduling	Tasks with less urgency will be delayed while automation is not available

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COST: No changes in budget

SCOPE: The VLA can be split up in subarrays. That is, some of the 27 antennas and corresponding baselines can be ordered to do a completely different and independent program than other antennas. Currently, projects requiring multiple subarrays must be handled manually. The goal of this milestone is to enable subarrays to go through the dynamic scheduler.

SCHEDULE: Work on automating subarrays has been slower than planned, mostly because of staffing issues in DMS. The system is now expected to be ready for testing by the end of Q1 FY2017. Note that the full integration of automated, dynamically-scheduled subarray observations into array operations will be carried as a separate goal in FY2017.

RISK & MITIGATION:

1. The risk to users of not having subarray observing automated is a slightly reduced chance of observing for priority C (filler) subarray projects. Mitigation is increased VLA scheduler vigilance, to avoid this happening.
2. The impact on the observatory is that effort is used for manual scheduling that could be used on more important (but less urgent) tasks, while we don't have automation we will continue giving priority to manual scheduling.

POP MILESTONE # FY15 3.4.62

Cost
Schedule
Scope

NM OPS

Renew VLBA lease for SC and OV

COST:

Labor Actuals	Expected
No changes	
Material Actuals	**Expected**
$42,581 /year	$2,750 / year
Travel Actuals	**Expected**
No changes	

SCOPE:

St. Croix, VI site land use lease has been renewed.

Owens Valley, CA site is not renewed yet. NRAO is awaiting lease negotiation outcome by Cal Tech (we sublease from Cal Tech).

SCHEDULE:

Milestone	Schedule	Target
1. St. Croix Lease renewed	12/31/14	12/31/14
2. Owens Valley Lease renewed	03/31/15	TBD

RISK & MITIGATION:

Risk	Mitigation
1. Impact on VLBA operating budget (increase in lease cost)	Adjust VLBA Operating budget.
2. Impact on VLBA operations	Avoid by periodic follow up of Cal Tech negotiation progress.

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COST: St Croix Lease: The lease has been signed by all parties and the increase in the lease cost reported in previous QSUs. Owens Valley Lease: To date, the cost to NRAO for sub-leasing the OV site has been $0/year. Future lease costs are subject to the status of Cal Tech's re-negotiation of the lease with Los Angeles Water and Power.

SCOPE: No changes.

SCHEDULE: Owens Valley Lease: Cal Tech negotiates this lease and it has been expired for 3.4 years. Los Angeles Water and Power is the lease holder. NRAO sub leases from Cal Tech. Progress has been marginal in the last quarter, according to the Cal Tech Owens Valley Radio Observatory Executive Director. The target date is shown as TBD for now, due to the uncertainty regarding when the lease will be signed.

RISK & MITIGATION:

1. Cal Tech has leased Owens Valley, CA for a low yearly fee. The probability of a cost increase is low, but a budget adjustment would be needed if a cost increase occurs.
2. Impacts on other aspects of VLBA Operations are not likely to occur.
3. An interim agreement between Cal Tech and NRAO regarding the sublease during this interim period is under discussion.

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