KEY		On track	Behind schedule	Complete		Ahe	ead	of s	chec	dule)ele	ted c	or c	han	ged		U	Inre	port	ed	
Ric	ala	al Energy	(1)		Ve		1	_	Vα	ar 2		Īν	ear	3		V		_		Vc		5	\neg
			(1	2	_	4			3 4	_		_	4	1	2		4	1		3	4
		9,		L 1: OPTIMIZE E	3101			_				_	<u> </u>	<u> </u>	•	·				<u> </u>			Ť
			(Outdoor Algal Pe	erfo	rma	ance	(N	MSL	J, UI	MM)												\neg
			Evaluate	<i>Galdieria</i> strains																			
	Re	assess biom	nass and lipid productivit																				
Stuc	dy the	responses o	stra of algae through time and	ins in cultivation				4									H			H			
Siuc	лу и пе	responses of	algae tillough tille and	Micro-Photobi	ore	acto	ors	(NIV	IC. I	JNM	<u> </u>	<u>. </u>	<u> </u>										_
	Use I	hydrogels to	encapsulate very high-de					(1411	,			T		П						П			_
			d-state devices and/or fluc				Ш							Ш						Ш		Ш	
Add	dress		of giant quantum dot cel				Ц		_					Ш								Ш	
		Characterize	e mircro-encapsulated a	algal-growth and nass partitioning																			
	Co	mpare photo	synthetic function between		Н									Н							\dashv		_
				lica gel matrices										Ш								Ш	
Con	npare	biomass ac	cumulation between bac	cterial and algae iple gel matrices																			
				gal Community E	Ecol	logy	y (U	NM	, SN	L, N	MSU	J)						!		ш			_
	Eva	luate how div	versity and trophic intera				Ì																
				lipid production				_		4	+												
	Mea	asure photosy	<u>`</u>	gal communities																			
			GO	OAL 2: IMPROVE							ICE	S											
	nalva	Zo Nannochk	oropsis (CCMP1776) an	Outdoor (Juiti	ivat	ion	(NI)	150)		T								П			
			for winter growth in the																				
	E	valuate pote	ntial for using municipal wastewaters in the p																				
				Process Engi	nee	rinç	g (U	NM	, NIV	ISU)											\equiv	\equiv	
	Eval	uate effects o	of lipids on biomass densi selectab	ity as a potential ble characteristic																			
	De	velop agent-	-based models of microl products in p	bes with storage photobioreactors																			
		Access ho	ow industrial, municipal, wastewater affects																				
		GO	AL 3: ENHANCE ENER	RGY RETURN O	N IN	IVE	STN	IEN	T A	ND \	VAS	TEV	/AT	ER (JTII	LIZ/	ATIC	ON					
				Extra	ctic	on (NMS	SU)									_				_	_	_
	ocess	sing concepts	nal, microwave-assisted, s for chemical extraction, ent recycling from proces and i	fuel conversion,																			
			and i	Proce	essi	ng ((NM	SU						لتحر			لت	أأأأ					
			ocessing technology on <i>I</i> and also ecologically stable	Vannochloropsis,																			
				Conv	ers	ion	(UN	IM)															
			on-metal catalyzed deca e-oxygenation of biocrud meet ASTN	arboxylation pro-																			
				Wastewate	r Ut	iliza	atio	า (E	NM	U)							_			_	_	_	
		Tes	st baseline performance	of turf scrubber																			
		C	haracterize wastewater	for turf scrubber																Π	, 7		

On track Behind schedule	Complete		Ahe	ead	of s	che	dule	е		De	elete	ed c	or ch	nang	ged		U	nre	oort	ed
Bioalgal Energy (1)		Vε	ear	1		٧	ar	2		ΙVο	ar	3	T	Ye	ar	_	一	Υc	ar	5
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-Ma	ev	1	2	3	4	1	2	3	4	1		<u>з</u>	4	1	2	3	4	1		3
Test turf scrubber with wastewater, and a		<u> </u>		<u> </u>	_	'		J	7	1	_	J	_	\dashv			┪	Ė	_	J
	CROSS-CUTTI	NG	INF	RA	STF	RUC	TU	RE									_	ш		
NMS	U's Chemical Analy								boı	rato	rv									
	Provide Overall										,									_
Provide centralized analytic prod			,																	
Develop biological standards (new s											╗		╗	П	П		٦	П	٦	
Develop Standard Operating Procedure	<u>-</u>																T			
	Purchase and I	nsta	II E	quip	mei	nt (I	NMS	SU)												
Continuous flow hydrother				Ė		,											\neg			
	0-400 C, 0-400 bar)	<u> </u>									_			\dashv		-	\dashv		\dashv	
	Cultivation Systems																		\dashv	
rial veeling eyelem (Evedee, engin	floatation (DAF))																			
	Purchase and I	nsta	II E	quip	mei	nt (I	ENN	ΛU)												
	Algae turf scrubber																			
Small-sca	le Experimental Ec	olog	gica	al De	esig	ın F	aci	lity	(SE	ED)	(UI	VM))							
	Provide Ov	eral	II Pr	ojed	ct Su	Jpp	ort													
High frequency	chemical analyses																			
Flexible cultiv	vation environments																			
Stable iso	ope measurements																			
	Purchase and Inst	all E	Equ	ipm	ent	(UN	IM,	NM	C)											
	Waters UPC2											_			Ш			Ш		
Water Fraction Collect	or & HP/Agileat 350									Щ	_	_			Ш	\Box		Ш		L
Digital cor	npound microscope														Ш	ightharpoonup	_	Ш		
	Photobioreactors														Ш	ightharpoonup		Ш		
	GC/MS											_	_		Щ		_	Ш		_
	MIMS			_									_		\square	_	_		_	_
	Isotopic laser	_					_					_	_	_	Ш	_	4		_	_
	al imaging upgrades		_	_							_	4		\dashv	$\vdash \vdash$	\dashv	4		\dashv	<u> </u>
Pn	otochemical reactor	<u> </u>	_												Ш		ᆚ	Ш		_
Farm allaharations in NIM array and		rsor	nne	I (AI	I)			ı .				_	_		$\overline{}$	\neg	\neg		\neg	
Form collaborations in NM among grou cultivation and waste	water management																			
·	g and Training Plan														\square	\dashv	_	Ш		_
	culty in engineering											_			\square	\dashv	_	Щ		<u> </u>
	nnician to run UPC2												_		\square	_	_	Ш	\Box	_
UNM/NMC student											_	4	_			_			Щ	
UNM student su	pport (2.5 per year)	_																		
	NMSU Faculty hire								Щ	Щ			_	4			4	Щ		
	MSU student hires								Щ				_	4			4	Щ		
ENMU entry-	evel technician hire										_	_	_	_	\square	_	4	Щ	_	_
	ENMU student hire	ı			1 1			l					1		i l	. 1		1 I		

Solar Energy (2)	Ye	ar	1		Ye	ar	2		Ye	ar	3		Υe	ar	4		Y	ear	5	
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
	1.	Bui	ld s	ola	r te	am	(Al	l)	-	-										
Hire/train graduate students																				
Identify team member at NMSU											Г		Г	Г			Г			Г
Hire physical or inorganic chemist																				
Incorporate new team member's expertise (NMT, NMSU)																				
2. Purchas	e a	nd i	nst	all	equ	ipm	ent	t (N	MT,	UN	M)									
MCD Magnet System																				
Time Resolved Spectroscopy																				
Fluorolog spectrophotometer																				
Raman Microscopy																				
3. Use nanoparticle ZnS to	cata	alyz	e re	du	ctio	n o	f C	02 ((NM	T, L	INM	, N	мн	U, N	IMS	U)				
Obtain preliminary data on ZnS NPs vs. microparticle																				
Explore and develop dye photosensitizers for ZnS catalysts																				
Investigate semiconductor catalysts MoS															Г					
Obtain spectroscopic characterization of NP catalysts																				
4. Develop stable BHJs from	n a	sin	gle	poly	yme	er s	yste	em	(NN	IT, ι	JNN	1, N	МН	U, I	VMS	SU)				
Synthesis of new polymeric systems and characterization																				
Incorporate non-covalent guests/C60 porphyrins																				
Spectroscopic characterization / fluorescence lifetime																				
9. Connections betwee	n E	PSO	CoR	tea	ıms	(NI	MT,	SF	i, Ui	νM,	NN	IHU	, NI	VISI	J)					
Outreach to K-12 students via SFI/GUTC																				
Explore collaboration w/ geoscientist for zeolite carbon capture																				
Explore collaboration w/ biologist using bioalgal carbon capture																				

Comotic Dower (2)	V	ear	<u>_</u>		V.	ar	2		V	ar	2		V.	ear	4		V	ear	_	
Osmotic Power (3)			Ē.	.		_	_			_	·				_	_	-	_		
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May		2	_	4		2	3	4	1	2	_	4	1	2	3	4	1	2	3	4
Purchase and	ins	tall	eq	uipı	mer	ıt (r	najo	or p	iece	es)	(NN	IT)								
Membrane Osmometer																	Ш			L
Pressure Retarded Osmosis (PRO) System																				
SEM-EDS																				
			R	ese	arcl	1														
Identify potential sources of produced water (NMT, UNM)																				
Characterize the compositions of source waters (NMSU, ENMU)																				
Evaluate the achievable trans-membrane pressures (NMT, UNM)																				
Assess the design requirements of membranes and membrane modules (All)																				
Design, construct, and modify bench-scale osmotic power systems (All)																				
Develop new thin film composite (TFC) membranes and modules to maximize power generation (NMT, UNM)																				
Investigate the occurrence, prevention, and mitigation of membrane fouling (All)																				
Perform cost-benefit analysis (NMT, UNM)																				
			Pe	rso	nne	el								-						
Develop Mentoring and Training Plan (All)																				
Hire/train graduate students (NMT)																				
Hire/train post-docs (NMT)																				
Hire/train research chemist (NMSU)																				

Uranium (4)	Υe	ar	1		Ye	ar	2		Ye	ar	3		Υe	ar	4		Υe		5	
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Purchase a	nd	ins	tall	equ	uipr	ner	t (n	najo	or p	iece	es)									
ICP-MS (NMT)																				
Microwave digestion system (NMT)																				
FFF (NMT)																				
HPLC Upgrades (NMT)																				
			Re	esea	arcl	1														
Plan for CI needs (All)																				
Develop and apply methodologies for rapid, sensitive measurement of U speciation (NMT, UNM)																				
Examine the kinetic stability of bio-reduced monomeric and colloidal U(IV) species in solution under anoxic and suboxic conditions (UNM, NMT)																				
Examine the effects of microbial activities on chemical speciation and mobility of U and related contaminants																				
Develop and test novel technologies for U remediation & de-mobilization (UNM, NMT)																				
Locate and characterize a site to study groundwater contamination (UNM, NMT)																				
Assess, delineate, and predict potential in situ mining impacts as well as contaminant plumes from legacy mining operations (UNM, NMT)																				
Perform field-scale mapping and modeling of subsurface U mobility at the field site (UNM, NMT)																				
Evaluate the potential roles of wind-born dust and animal (or human) vectors in the arid tribal lands of the Diné reservation (NMT, UNM)																				
Develop collaborations with the Navajo Nation, Laguna Pueblo, and Sandia National Labs (UNM, NMT)																				
Education and outreach program for Navajo and Puebloan students on the reservation (NMT, UNM)																				
			Pe	rso	nne	el														
Develop Mentoring and Training Plan													L				Ц			
Hire/train graduate students (UNM, NMT)																				

Goothermal Energy (5)	V.	ear	1		V		2		V		3		V		1		V/			\neg
Geothermal Energy (5) 1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2 2	3	4	1	2 2	3	4	1	2	3	4	1	2 2	3	
	rsc	onno			_				_		3	4	1		J	4	'		3	4
Develop Mentoring and Training Plan			or a		<u> </u>		Tuti		Ĺ					Г						一
Recruit students for yrs. 2 & 4 (UNM, NMT)																				
Develop recruiting brochure (UNM, NMT)																				П
Explore wider collaborations across																				
institutions and tribes (UNM, NMT)																				
Develop partnerships with private sector, governmental agencies, and national labs (NMT, UNM)																				
Hire/train graduate students																				
Develop outreach and educational materials (NMT, UNM)																				
Engage with Geothermal Resources Council (NMT, UNM)																				
Develop IWGs for geothermal (UNM, NMT)											Г					Г				П
Purchase a	and	ins	tall	eq	uipr	nen	t (n	najo	r p	iece	es)									
Magneto-telluric system (NMT)																				
Visualization work stations (NMT)																				
Autonomous sensors/field mass spectrometers (UNM)																				
			Re	ese	arcl	1														
Select geothermal systems in New Mexico for analysis (NMT, UNM)																				
Characterize the compositions of waters and gases in these systems using published and new data (UNM, NMT)																				
Assess influence of geothermal systems and systems development on potable water quality (UNM)																				
Measure the magneto-telluric signature and resistivity of the subsurface below the targeted areas (NMT)																				
Determine the temperature of these systems using published and new data and develop new techniques to determine temperatures (NMT, UNM)																				
Determine radiometric dates of geothermal deposits and fault systems (UNM, NMT)																				
Add new data to existing databases and link to other databases (NMT)																				
Make 2D geologic cross sections, 3D geologic block diagrams, and 2D and 3D conceptual model system (NMT, UNM)																				
Develop high performance 2D and 3D hydrothermal computer models (NMT, UNM)																				
Model sustainability of geothermal production over several decades (NMT, UNM)																				
Evaluate & categorize thermal energy in place and potential power sources (NMT, UNM)																				

Social & Natural Science Nexus (6)	Υe	ar	1		Ye	ar	2		Υe	ar	3		Υe	ar	4		Ye	ar	5	\neg
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	_	4	1	2	3	4	1	2	_	4	1	2	3	4
Build an SD infrastructure to integrate social and natural sciences by developing energy, socioeconomic and water budgets (All)																				
Create an infrastructure to collect and use human perceptions data (UNM)																				
Develop experimental data and experimental protocols to help fill data gaps on human perceptions and choices																				
Develop and administer an initial statewide survey to provide baseline data on attitudes about energy/water issues																				
Develop a statewide dynamic water budget that is linkable through the SD model to other science and social data models (NMSU)																				
Merge existing and new water resource data to establish dynamic water budgets that researchers and policymakers can access when they need integrated current status water budgets (NMSU)																				
Develop statewide and regional modules (as applicable) and a statewide model that crosses disciplines, incorporating modules from disparate fields into a decision support system designed with flexible scale and focus (All)																				
Assemble team for data integration and modeling workshops with the CI team and for research team meetings and visits to data repositories (All)																				
Develop database of existing data sources, including socioeconomic, water, energy, legal, environmental, and physical infrastructure (All)																				
Reach out to state agencies that can contrib- ute to the model's relevance, the utilization of our products, and future research (All)																				
Collaborate across EPSCoR research teams to integrate research into database and integrated decision support system (All)																				
Enhance collaboration with policymakers and stakeholders (All)																				
Develop Mentoring and Training Plan																				
Hire/train graduate students (UNM, NMSU)																				
Hire/train post-docs (NMSU)																				

Diversity (7)	Y	ear	1		Ye	ar	2		Υe	ar	3		Υe	ar	4		Υe	ar	5	
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Hire Diversity Coordinator																				
Complete researcher mentoring plans																				П
Diversity IWG																				
Project leadership attends SACNAS/AISES																				
Attend NM LSAMP Student Research Conference																				
Gather project diversity data; report at All Hands Meeting																				

Workforce Development (8)	Ye	ar	1		Ye	ar	2		Ye	ar	3		Υe	ar	4		Ye	ar	5	\neg
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
GUTC Curriculum Units																				П
GUTC Summer Professional Development Workshop (5 days)																				
GUTC Fall Professional Development Workshop (1 day)																				
GUTC Spring Professional Development Workshop (1 day)																				
GUTC Club meeting (13 weeks per semester)																				
Career Connections Conferences																				
Student Roundtables																				
STEMAP web materials developed																				
STEMAP recruitment at PUIs																				
STEMAP summer program																				
STEMAP quarterly webinars																				
Externship program guidelines/application																				
Recruit & select externship students/labs																				
5 graduate students placed in externships																				
Post-doc workshop (4 days)																				
PUI Faculty Leadership and PD Institute																				
Online folow-up learning sessions for PUI faculty																				
Form four colleague research teams (CC/ Univ. Researchers)																				
Training for Undergraduate Faculty Institutional Coordinators (FIC)																				
Create/update ICCE curriculum																				
Host ICCE																				
Host ICCE Fellows in New Mexico																				
On-going ICCE Fellows support/mentoring																				

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Cyberinfrastructure (9)		ear				ar	_	_		ar	Ť-			ar	Ė	_		ar	Ť	
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop Mentoring and Training Plan																				
Integrated Da	ata	Sto	rag	e ar	nd N	/lod	elin	g P	orta	al (l	ואר	/ 1)								
Develop analytic services and client interfaces																				
Provide new capabilities for socioeconomic modeling and analysis																				
Ongoing data acquisition as requested to support project research																				
Expand the systems analytic capabilities																				
Document data products and integrate them into portal																				
Include an education resources section																				
Evolve the current XML document-based data documentation model																				
Modify component services that deliver ISO metadata (Semantic-enabled)																				
Expanding Our Interoperabili	ty v	vith	Nat	tion	al a	ınd	Inte	erna	itioi	nal	Dat	a N	etw	ork	s (L	JNN	l)			
Continue the Western Consortium CI Working Group																				
Expand support for web service protocols used by networks																				
Connect to external geospacial platforms																				
Register project data products with international and national registries																				
Add project data products to LoboVault																				
Enhanc	ing	Too	ols 1	or (Coll	abo	rat	ion	(UN	IM)										
Develop next generation data-centered collaboration capabilities																				
Support an online lab notebook system																				

External Engagement (10)	Y	ear	1		Ye	ar	2		Υe	ar	3		Υe	ar	4		Ye	ear	5	
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ISE Net Annual Metting																				
Researcher/ISE Meetings																				
ISE Regional meetings (3/year)																				
Award museum programming mini grants																				
Exhibit front-end study																				
NMMNHS Exhibit planning and opening																				
¡Explora! Exhibit planning and opening																				
NMNSH Exhibit planning and opening																				
Town Hall																				
EPSCoR Newsletter																				
NM EPSCoR Website revised/updated																				

Evaluation and Assessment (11)	Ye			Ye	ar	2		Υe	ar	3		Υe	ar	4		Ye	ar	5		
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Finalize Evaluation & Assessment (E&A) plan																				
Collect baseline data																				
External E&A Report																				
External Advisory Board meeting																				
AAAS Review																				
Exhibit evaluation																				

Sustainability	Year 1			Year 2				Year 3				Year 4				Year 5				
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
New faculty hires (4)																				
Teacher PD (Exploratorium)																				
ISE-led teacher workshops																				
Follow-up teacher PD																				
NSF Day																				
I-IWGs (3/year)																				
Seed Awards																				

Management (13)	Year 1			Year 2				Year 3				Year 4				Year 5				
1: June-Aug; 2: Sept-Nov; 3: Dec-Feb; 4: Mar-May	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Strategic Plan development and review																				
Subaward fiscal training including Yr. 5 closeout																				
Component budget review																				
Annual CUP presentation																				
State Committee meetings																				
Campus visits (1/quarter)																				
Reverse site visit (estimated)																				
Annual reporting																				
Monthly team meetings																				
Quarterly collaboration meetings (2 teams/ quarter)																				
Quarterly Management Team meetings																				
All Hands Meeting																				