

1.1 MONITORING PLAN
Construction period

Environmenta I item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
Air quality	H ₂ S - CO ₂	Borinquen Hotel and 4 sites (north, south, east and west) on the well base boundary	During testing period (weeks-one month): every three month (quarterly) and permanent monitoring station	Field measurement	ICE

Calidad del Aire - CAMPO GEOTERMICO BORINQUEN								
Sitio	CO2 Min	CO2 Prm	CO2 Max	CO2 Std	H2S Min	H2S Prm	H2S Max	H2S Std
CAÑAS DULCES	252	333	404	5,000	0.000	0.000	0.002	0.010
CASA MAQUINAS BORINQUEN	232	318	389	5,000	0.000	0.000	0.002	0.010
HOTEL BORINQUEN	239	318	381	5,000	0.000	0.000	0.001	0.010
HOTEL BUENA VISTA	244	318	382	5,000	0.000	0.000	0.002	0.010
PLB-02	235	320	378	5,000	0.000	0.001	0.005	0.010
PLB-03	235	317	375	5,000	0.000	0.000	0.003	0.010
PLB-05	235	327	395	5,000	0.000	0.002	0.012	0.010
PLB-09	237	315	374	5,000	0.000	0.000	0.001	0.010
POBLADO BUENA VISTA	234	321	390	5,000	0.000	0.000	0.001	0.010

Environmenta I item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
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Noise	Noise level	Borinquen Hotel, one site on the well pad boundary (in the hotel direction), and 4 sites (north, south, east and west) in the vicinity of the power plant site.	During testing period (weeks-one month): once/week During power plant construction: monthly (with peak time for each construction job taken into account)	Field measurement	ICE
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Ruido - CAMPO GEOTERMICO BORINQUEN				
Sitio	Ruido Min	Ruido Prm	Ruido Max	Ruido Std
CAÑAS DULCES	31	41	46	65
CASA MAQUINAS BORINQUEN	29	37	68	65
HOTEL BORINQUEN	30	35	48	65
HOTEL BUENA VISTA	30	34	39	65
PLB-02	31	47	80	65
PLB-03	31	36	64	65
PLB-05	30	47	88	65
PLB-09	30	36	57	65
POBLADO BUENA VISTA	31	35	39	65

Environmenta l item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
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Attachment 2

<p>Water quality</p>	<p>1) pH, Electric conductivity (EC), Chlorides (Cl-)</p>	<p>Upper and lower streams of the Salitral rivers, upper and lower streams within the project area (AP) of the creek running.</p>	<p>1) During testing period: twice/testing period (weeks-one month)</p>	<p>Laboratory analysis of collected samples</p>	<p>ICE and External laboratory to hire by ICE</p>
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Attachment 2

Geothermal Field	CG-BRQ
Monitored variable	pH Lab.

Site	Max.	Min.	Avg.
CG-BRQ --- NACIENTE DOS QUEBRADAS	7.86	5.99	6.9
CG-BRQ --- NACIENTE NAVARIT	7.83	5.71	6.8
CG-BRQ --- QUEBRADA GATA	8.12	5.36	7.3
CG-BRQ --- QUEBRADA TENCHA (PBR11)	7.81	5.76	6.9
CG-BRQ --- RIO SALITRAL	8.34	6.04	7.5
CG-BRQ --- RIO TIZATE	8.39	6.72	7.8
CG-BRQ --- TERMAL LOS PEDERNALES	7.28	5.95	6.6
CG-BRQ --- TOMA AGUA LAS LILAS	7.01	5.9	6.7
CG-BRQ --- TOMA DE AGUA PLB-02	7.97	4.66	7.3
CG-BRQ --- TOMA DE AGUA PLB-05	8.21	5.8	7.1
CG-BRQ --- LAGUNA DE ALMACENAMIENTO	7.84	3.02	7.1

Geothermal Field	CG-BRQ
Monitored variable	Cond. (µS/cm)

Site	Max.	Min.	Avg.
CG-BRQ --- NACIENTE DOS QUEBRADAS	210.9	97	154.7
CG-BRQ --- NACIENTE NAVARIT	245.4	148.9	183.5
CG-BRQ --- QUEBRADA GATA	348	115.4	214.4
CG-BRQ --- QUEBRADA TENCHA (PBR11)	263	74.5	140.4
CG-BRQ --- RIO SALITRAL	328	80.8	170.4
CG-BRQ --- RIO TIZATE	306.5	127.4	220.3
CG-BRQ --- TERMAL LOS PEDERNALES	189.2	138.7	163.4
CG-BRQ --- TOMA AGUA LAS LILAS	189	141.5	178.1
CG-BRQ --- TOMA DE AGUA PLB-02	432.3	70.6	124.6
CG-BRQ --- TOMA DE AGUA PLB-05	674	78.8	144.8
CG-BRQ --- LAGUNA DE ALMACENAMIENTO	885	92	355.7

Attachment 2

Geothermal Field	CG-BRQ
Monitored variable	Cl- (ppm)

Site	Max.	Min.	Avg.
CG-BRQ --- NACIENTE DOS QUEBRADAS	8	2.46	4.3
CG-BRQ --- NACIENTE NAVARIT	7.8	2	4.2
CG-BRQ --- QUEBRADA GATA	12.2	1.31	5.7
CG-BRQ --- QUEBRADA TENCHA (PBR11)	11.3	1.33	4.5
CG-BRQ --- RIO SALITRAL	27.94	1.35	6.5
CG-BRQ --- RIO TIZATE	16.1	5.2	8.9
CG-BRQ --- TERMAL LOS PEDERNALES	4.72	2.64	3.2
CG-BRQ --- TOMA AGUA LAS LILAS	11.5	3.79	5.6
CG-BRQ --- TOMA DE AGUA PLB-02	7.49	2.75	4.5
CG-BRQ --- TOMA DE AGUA PLB-05	13.1	1.42	4.4
CG-BRQ --- LAGUNA DE ALMACENAMIENTO	8.18	0.97	4.5

<p>Water quality</p>	<p>2) Oils and grease,</p>	<p>Outlet of the settling basin (construction work effluents). Only in the presence of machinery in the project area (AP)</p>	<p>2) Oils and grease, every six months (semester) After 2 years, the continuation of monitoring will be reconsidered based on opinions of professional experts.)</p>	<p>Laboratory analysis of collected samples</p>	<p>ICE and External laboratory to hire by ICE</p>
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Attachment 2

	Site		Oils and grease (mg/L)											
	Standard	50 mg/L	Min	Max										
	Q. Gata Abajo		<0,2	8										
	Q. Gata Arriba		<0,2	<1										
	Río Salitral Abajo		<0,2	4										
	Río Salitral Arriba		<0,2	<1										
	Río Tizate Abajo		<0,2	<1										
	Río Tizate Arriba		<0,2	<1										
	Tencha Abajo		<0,2	<1										
	Tencha Arriba		<0,2	<1										
	Toma PLB-02		<0,2	<1										
	Toma PLB-05		<0,2	<1										
Water quality	3) Hexavalent chrome (Cr+6), and Mercury (Hg) and COD	NOT APPLICABLE (NA)	NOT APPLICABLE (NA)	-----										
Water quality	4) Arsenic (As)	Only in drinking water intakes	every six months (semester) After 2 years, the continuation of monitoring will be reconsidered based on opinions of professional experts.)	Laboratory analysis of collected samples	ICE and External laboratory to hire by ICE									
<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Site</th> <th colspan="2">Arsenic (mg/L)</th> </tr> <tr> <th>Standard</th> <th>Min</th> <th>Max</th> </tr> </thead> <tbody> <tr> <td>Plantel Curubandé</td> <td><1</td> <td><2</td> </tr> </tbody> </table>						Site	Arsenic (mg/L)		Standard	Min	Max	Plantel Curubandé	<1	<2
Site	Arsenic (mg/L)													
Standard	Min	Max												
Plantel Curubandé	<1	<2												
Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge									

Attachment 2

Soil	Complete analysis - Cadmium (Cd), Lead (Pb), As, Cr ⁺⁶ , Hg, etc.	Four points in the vicinity of a representative geothermal field	One year before construction starts, and once five years after operation starts	Laboratory analysis of collected samples	ICE
		Four points in the vicinity of the power plant site	One year before construction starts, and once five years after operation starts		
	Not applicable for this period. Monitoring in 2022.				
Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
Fauna and flora	Plants and animals (birds, amphibians, reptiles, and mammals)	Area in the vicinity of wells and power plant site, the project site side of the national park, and gallery forest along the Salitral river	Monthly (with rainy and dry seasons, breeding seasons, etc. taken into account)	Visual observation records and photographs	ICE

Results of monitoring and state of conservation of species. October, november and december 2021.

Group	State of conservation		
Amphibian	CITES	IUCN	MINAE N° 40548-Regulations
<i>Agalychnis callidryas</i>	II		RP
<i>Cochranella granulosa</i>			
<i>Craugastor bransfordii</i>			
<i>Craugastor fitzingeri</i>			
<i>Craugastor megacephalus</i>			
<i>Craugastor mimus</i>			RP
<i>Diasporus diastema</i>			
<i>Engystomops pustulosus</i>			RP
<i>Incilius luetkenni</i>			
<i>Leptodactylus savagei</i>			
<i>Lithobates forreri</i>			
<i>Lithobates warszewitschii</i>			
<i>Rhinella horribilis</i>			
<i>Smilisca sordida</i>			
<i>Trachycephalus typhonius</i>			
Birds			
<i>Amazilia rutila</i>	II		RP
<i>Amazilia saucerrottei</i>	II		RP
<i>Amazilia tzacatl</i>	II		RP
<i>Amazona albifrons</i>	II		RP
<i>Aramides albiventris</i>			
<i>Archilochus colubris</i>	II		RP
<i>Arremon aurantirostris</i>			
<i>Arremonops rufivirgatus</i>			
<i>Attila spadiceus</i>			
<i>Basileuterus culicivorus</i>			
<i>Basileuterus rufifrons</i>			
<i>Brotogeris jugularis</i>	II		RP
<i>Burhinus bistriatus</i>	III		

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	<i>Buteo plagiatus</i>	II		RP
	<i>Buteo platypterus</i>	II		RP
	<i>Calocitta formosa</i>			
	<i>Campephilus guatemalensis</i>			
	<i>Campylorhynchus rufinucha</i>			
	<i>Cantorchilus modestus</i>			
	<i>Cardellina canadensis</i>			
	<i>Cathartes aura</i>			
	<i>Catharus ustulatus</i>			
	<i>Chiroxiphia linearis</i>			
	<i>Chlorostilbon canivetii</i>	II		RP
	<i>Ciccaba virgata</i>	II		RP
	<i>Columbina talpacoti</i>			
	<i>Coragyps atratus</i>			
	<i>Crax rubra</i>	III	VU	RP
	<i>Crotophaga sulcirostris</i>			
	<i>Crypturellus cinnamomeus</i>			
	<i>Cypseloides niger</i>			
	<i>Dendrocolaptes sanctithomae</i>			
	<i>Empidonax flaviventris</i>			
	<i>Eucometis penicillata</i>			
	<i>Eumomota superciliosa</i>			
	<i>Eupherusa eximia</i>	II		RP
	<i>Euphonia affinis</i>			
	<i>Euphonia hirundinacea</i>			
	<i>Euphonia luteicapilla</i>			
	<i>Eupsittula canicularis</i>	II		RP
	<i>Eurypyga helias</i>			RP
	<i>Falco ruficularis</i>	II		RP
	<i>Geothlypis poliocephala</i>			
	<i>Habia rubica</i>			
	<i>Henicorhina leucophrys</i>			
	<i>Herpetotheres cachinnans</i>	II		RP
	<i>Hylocharis eliciae</i>	II		RP
	<i>Hylocichla mustelina</i>			NT
	<i>Hylomanes momotula</i>			RP
	<i>Hylophylax naevioides</i>			

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		<i>Leiothlypis peregrina</i>			
		<i>Leptotila verreauxi</i>			
		<i>Megarynchus pitangua</i>			
		<i>Melanerpes hoffmannii</i>			
		<i>Micrastur semitorquatus</i>	II		RP
		<i>Mniotilta varia</i>			
		<i>Momotus lessonii</i>			
		<i>Morococcyx erythropygus</i>			
		<i>Myiarchus crinitus</i>			
		<i>Myiarchus nuttingi</i>			
		<i>Myiarchus tuberculifer</i>			
		<i>Myiarchus tyrannulus</i>			
		<i>Myiothlypis fulvicauda</i>			
		<i>Myiozetetes similis</i>			
		<i>Nyctidromus albicollis</i>			
		<i>Pachysylvia decurtatus</i>			
		<i>Parkesia noveboracensis</i>			
		<i>Patagioenas flavirostris</i>			
		<i>Penelope purpurascens</i>	III		RP
		<i>Peucaea ruficauda</i>			
		<i>Phaethornis guy</i>			
		<i>Phaethornis striigularis</i>	II		RP
		<i>Piaya cayana</i>			
		<i>Piranga rubra</i>			
		<i>Pitangus sulphuratus</i>			
		<i>Pseudastur albicollis</i>	II		RP
		<i>Psilorhinus morio</i>			
		<i>Ramphastos ambiguus</i>		NT	
		<i>Ramphastos sulfuratus</i>	II		RP
		<i>Ramphocaenus melanurus</i>			
		<i>Rupornis magnirostris</i>	II		RP
		<i>Setophaga petechia</i>			
		<i>Streptoprocne zonaris</i>			
		<i>Thamnophilus doliatus</i>			
		<i>Thryophilus pleurostictus</i>			
		<i>Thryophilus rufalbus</i>			
		<i>Tityra semifasciata</i>			
		<i>Trogon caligatus</i>			

		<i>Trogon melanocephalus</i>			
		<i>Turdus assimilis</i>			
		<i>Turdus grayi</i>			
		<i>Tyrannus melancholicus</i>			
		<i>Tyto alba</i>			
		<i>Vireo olivaceus</i>			
		<i>Vireo philadelphicus</i>			
		<i>Volatinia jacarina</i>			
		<i>Xiphorhynchus lachrymosus</i>			
		<i>Xiphorhynchus susurrans</i>			
		Mammals (Visual, Sherman, Mist nets and Camera trap)			
		<i>Alouatta palliata</i>	I		EN
		<i>Artibeus aztecus</i>			
		<i>Artibeus jamaicensis</i>			RP
		<i>Artibeus lituratus</i>			
		<i>Artibeus tolteca</i>			
		<i>Artibeus watsoni</i>			
		<i>Ateles geoffroyi</i>	I	EN	EN
		<i>Carollia castanea</i>			
		<i>Carollia perspicillata</i>			
		<i>Carollia sowelli</i>			
		<i>Carollia subrufa</i>			
		<i>Cebus imitator</i>	II		RP
		<i>Chiroderma salvini</i>			
		<i>Dasyprocta punctata</i>	III		
		<i>Desmodus rotundus</i>			
		<i>Didelphis marsupialis</i>			
		<i>Eira barbara</i>	III		
		<i>Glossophaga soricina</i>			
		<i>Marmosa mexicana</i>			
		<i>Micronycteris microtis</i>			
		<i>Myotis elegans</i>			
		<i>Myotis riparius</i>			
		<i>Nasua narica</i>	III		
		<i>Nyctomys sumichrasti</i>			
		<i>Odocoileus virginianus</i>	III		
		<i>Oryzomys couesi</i>			

		<i>Ototylomys phyllotis</i>			
		<i>Platyrrhinus helleri</i>			
		<i>Potos flavus</i>	III		
		<i>Proechimys semispinosus</i>			
		<i>Sciurus variegatoides</i>			
		<i>Sturnira parvidens</i>			
		<i>Sylvilagus floridanus</i>			
		<i>Tapirus bairdii</i>	I	EN	EN
		<i>Trinycteris nicefori</i>			
		<i>Tylomys watsoni</i>			
		<i>Uroderma bilobatum</i>			
		<i>Vampyressa thylene</i>			
		<i>Caluromys derbianus</i>			
		<i>Conepatus semistriatus</i>			
		<i>Nasua narica</i>	III		
		<i>Sciurus deppei</i>			RP
		<i>Cuniculus paca</i>	III		
		<i>Dasybus novemcinctus</i>			
		<i>Tamandua mexicana</i>	III		
		<i>Leopardus pardalis</i>	I		EN
		<i>Pecari tajacu</i>	II		RP
		<i>Puma concolor</i>	I		EN
		<i>Didelphis virginiana</i>			
		Reptiles			
		<i>Basiliscus basiliscus</i>			
		<i>Boa imperator</i>			
		<i>Bothrops asper</i>	II		RP
		<i>Corytophanes cristatus</i>			
		<i>Ctenosaura similis</i>			
		<i>Holcosus festivus</i>			
		<i>Holcosus undulatus</i>			
		<i>Imantodes cenchoa</i>			
		<i>Imantodes gemmistratus</i>			
		<i>Leptodeira rhombifera</i>			
		<i>Micrurus nigrocinctus</i>	III		
		<i>Norops biporcatus</i>			
		<i>Norops cupreus</i>			
		<i>Norops oxylophus</i>			

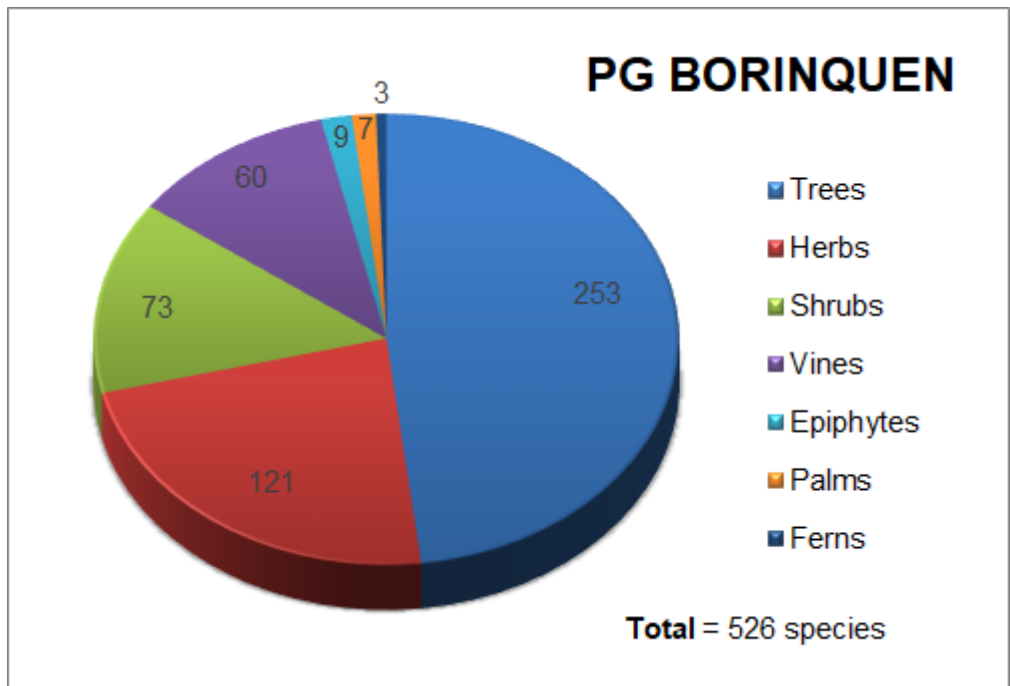
<i>Sceloporus variabilis</i>			
<i>Trimorphodon quadruplex</i>			

I=Appendix I CITES, II=Appendix II CITES, III=Appendix III CITES, IUCN= The International Union for Conservation of Nature, CITES=The Convention on International Trade in Endangered Species of Wild Fauna and Flora, NT= Near Threatened, EN= endangered species, RP= species with reduced or threatened populations, VU= Vulnerable.

Wild animals monitoring. October 2021.
Bat monitoring



Distribution of flora species by habits registered in the Borinquen Geothermal Field.
March 2014 – December 2021.



Attachment 2

Environmental item	Item to be monitored	Monitoring site	Frequency	Method	Party in charge
Waste*	Generated amount	Power plant construction site	Monthly	Total of generated amount (weight or volume)	Construction contractor
	Not applicable for this period. In 2023 starts the construction of plant.				

*Appropriate waste management including disposal of sludge will be implemented in accordance with Law for the Integrated Management of Residues (Law 8839), and in reference to Resolution No. 1948-2008-SETENA17 (page26).