**TechRate** January, 2023

# TECH RATE

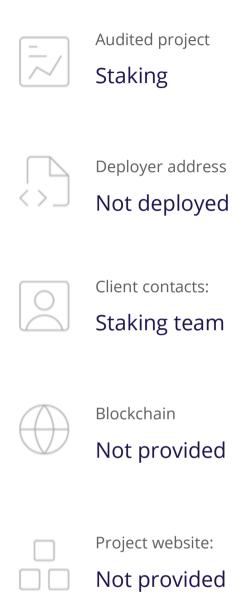
# SMART CONTRACTS SECURITY **AUDIT REPORT**







# **Audit Details**







### Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as at the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against us on the basis of what it says or doesn't say, or how we produced it, and it is important for you to conduct your own independent investigations before making any decisions. We go into more detail on this in the disclaimer below – please make sure to read it in full.

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The analysis of the security is purely based on the smart contracts alone. No applications or operations were reviewed for security. No product code has been reviewed.



# Background

TechRate was commissioned by Staking to perform an audit of smart contracts:

staking.rtf

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.



# **Issues Checking Status**

	Issue description	Checking status
1.	Compiler errors.	Passed
2.	Race conditions and Reentrancy. Cross-function race conditions.	Passed
3.	Possible delays in data delivery.	Passed
4.	Oracle calls.	Passed
5.	Front running.	Passed
6.	Timestamp dependence.	Passed
7.	Integer Overflow and Underflow.	Passed
8.	DoS with Revert.	Passed
9.	DoS with block gas limit.	Low issues
10.	Methods execution permissions.	Passed
11.	Economy model of the contract.	Passed
12.	The impact of the exchange rate on the logic.	Passed
13.	Private user data leaks.	Passed
14.	Malicious Event log.	Passed
15.	Scoping and Declarations.	Passed
16.	Uninitialized storage pointers.	Passed
17.	Arithmetic accuracy.	Passed
18.	Design Logic.	Medium issues
19.	Cross-function race conditions.	Passed 1780
20.	Safe Open Zeppelin contracts implementation and usage.	Passed
21.	Fallback function security.	Passed

### **Security Issues**

No high severity issues found.

- Medium Severity Issues
  - 1. Abuse of authority

#### Issue:

 Main address can call removeStakers() function and remove user's stakes.

#### **Recommendation:**

Do not allow anybody to access users balances.

- Low Severity Issues
  - 2. Out of gas

#### Issue:

• The function removeStakers() uses the loop to remove stakers from the list. Function will be aborted with OUT\_OF\_GAS exception if there will be a long addresses list.

#### **Recommendation:**

Check that the array length is not too big.

#### Notes:

Previous never set.

# Owner privileges (In the period when the owner is not renounced)

- Owner can transfer ownership.
- Owner can update staking limits.
- Owner can change maxTotal, maxWallets and minimumStakeTime.
- Owner can change resetTime.
- Owner can change emergencyRate.
- Owner can enable/disable emergencyRateEnabled.
- Owner can reset the contract.
- Owner can change TOKEN and REWARD addresses.
- Owner can enable/disable open value.
- Owner can start and finish distribution.
- Owner can top up contract reward balance.
- Owner can withdraw contract ERC20 and native tokens.
- Owner can change distribution period.
- Owner can change minPeriod.

## Testnet deployment

Contracts Description Table

Contra	ict Type	Bases		
L	Function Name	Visibility	Mutability	Modifiers
BCBStal	<b>king</b> Implementation	IDistributor, ReentrancyGuard		
L	<u>updateStakeLimits</u>	External <b>[</b>		onlyMain
L	<u>updateMaxTotal</u>	External <b>!</b>		onlyMain
L	<u>updateMaxWallets</u>	External <b>!</b>		onlyMain
L	<u>updateMinStakeTime</u>	External <b>[</b>		onlyMain
L	<u>updateResetTime</u>	External <b>!</b>		onlyMain
L	<u>updateEmergencyRate</u>	External <b>!</b>		onlyMain
L	<u>enableEmergencyRate</u>	External <b>[</b>		onlyMain
L	<u>setToken</u>	External <b>[</b>		onlyMain
L	<u>setReward</u>	External <b>[</b>		onlyMain
L	<u>setOpen</u>	External <b>[</b>		onlyMain
L	startDistribution	External <b>[</b>		initialization onlyMain
L	<u>topUp</u>	External <b>!</b>		onlyMain
L	<u>setDistributionPeriod</u>	External <b>!</b>		onlyMain
L	<u>setDistributionParameters</u>	External <b>!</b>		onlyMain
L	<u>relock</u>	External <b>!</b>		nonReentrant
L	<u>stake</u>	External <b>!</b>		nonReentrant
L	<u>claimReward</u>	External <b>!</b>		nonReentrant
L	<u>emergencyUnstake</u>	External <b>[</b>		nonReentrant
Legend				
Symbol	Meaning			
	Function can modify state			
<u>u</u>	Function is payable			

#### Conclusion

Smart contracts contain medium severity issues! The further transfers and operations with the funds raise are not related to this particular contract.

Security score: 73.

#### TechRate note:

Please check the disclaimer above and note, the audit makes no statements or warranties on business model, investment attractiveness or code sustainability. The report is provided for the only contract mentioned in the report and does not include any other potential contracts deployed by Owner.