



**TechRate**

AUDIT COMPANY

# Smart Contract Security Audit

TechRate

June, 2021

# Audit Details



Audited project

**PolyVertex**



Deployer address

**0xbd73a24FDab28ab44080b3766f24877A7e8BB177**



Client contacts:

**PolyVertex team**



Blockchain

**Polygon**



Project website:

**<https://polyvertex.finance/>**

# 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 below 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 PolyVertex to perform an audit of smart contracts:

<https://polygonscan.com/address/0x8be82ab9b6179be6eb88431e3e4e0fd93b9e607c#code>

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.

# Contracts Details

Token contract details for 22.06.2021

Contract name	PolyVertex
Contract address	0x8bE82Ab9B6179bE6EB88431E3E4E0fd93b9E607C
Bonus multiplier	1
Total alloc point	43250
Start block	15751269
Pool length	12
Fee address	0x8847a75c52dc68cae2594b12e143e960df17a9b1
Egg	0x72572ccf5208b59f4bcc14e6653d8c31cd1fc5a0
Egg per block	5000000000000000000
Contract deployer address	0xbd73a24FDab28ab44080b3766f24877A7e8BB177
Contract's current owner address	0x8ec313cfbc877a9e0559c8e80763a9a058c28c69

# MasterChef functions details

## + [Lib] SafeMath

- [Int] add
- [Int] sub
- [Int] sub
- [Int] mul
- [Int] div
- [Int] div
- [Int] mod
- [Int] mod

## + [Int] IERC20

- [Ext] totalSupply
- [Ext] balanceOf
- [Ext] transfer #
- [Ext] allowance
- [Ext] approve #
- [Ext] transferFrom #

## + [Lib] Address

- [Int] isContract
- [Int] sendValue #

## + [Lib] SafeERC20

- [Int] safeTransfer #
- [Int] safeTransferFrom #
- [Int] safeApprove #
- [Int] safeIncreaseAllowance #
- [Int] safeDecreaseAllowance #
- [Prv] \_callOptionalReturn #

## + Context

- [Int] \_msgSender
- [Int] \_msgData

## + Ownable (Context)

- [Int] <Constructor> #
- [Pub] owner
- [Pub] renounceOwnership #
  - modifiers: onlyOwner
- [Pub] transferOwnership #
  - modifiers: onlyOwner

## + ReentrancyGuard

- [Int] <Constructor> #

## + ERC20 (Context, IERC20)

- [Pub] <Constructor> #
- [Pub] name
- [Pub] symbol
- [Pub] decimals
- [Pub] totalSupply



- [Pub] balanceOf
  - [Pub] transfer #
  - [Pub] allowance
  - [Pub] approve #
  - [Pub] transferFrom #
  - [Pub] increaseAllowance #
  - [Pub] decreaseAllowance #
  - [Int] \_transfer #
  - [Int] \_mint #
  - [Int] \_burn #
  - [Int] \_approve #
  - [Int] \_setupDecimals #
  - [Int] \_beforeTokenTransfer #
- + VertexToken (ERC20, Ownable)
- [Pub] mint #
    - modifiers: onlyOwner
  - [Ext] delegates
  - [Ext] delegate #
  - [Ext] delegateBySig #
  - [Ext] getCurrentVotes
  - [Ext] getPriorVotes
  - [Int] \_delegate #
  - [Int] \_moveDelegates #
  - [Int] \_writeCheckpoint #
  - [Int] safe32
  - [Int] getChainId
- + MasterChefV2 (Ownable, ReentrancyGuard)
- [Pub] <Constructor> #
  - [Ext] poolLength
  - [Pub] add #
    - modifiers: onlyOwner, nonDuplicated
  - [Pub] set #
    - modifiers: onlyOwner
  - [Pub] getMultiplier
  - [Ext] pendingEgg
  - [Pub] massUpdatePools #
  - [Pub] updatePool #
  - [Pub] deposit #
    - modifiers: nonReentrant
  - [Pub] withdraw #
    - modifiers: nonReentrant
  - [Pub] emergencyWithdraw #
    - modifiers: nonReentrant
  - [Int] safeEggTransfer #
  - [Pub] dev #
  - [Pub] setFeeAddress #
  - [Pub] updateEmissionRate #
    - modifiers: onlyOwner

(\$ ) = payable function

# = non-constant function

# 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.	Passed
19.	Cross-function race conditions.	Passed
20.	Safe Open Zeppelin contracts implementation and usage.	Passed
21.	Fallback function security.	Passed



# Security Issues

## ✓ High Severity Issues

No high severity issues found.

## ✓ Medium Severity Issues

No medium severity issues found.

## ✓ Low Severity Issues

### 1. Block gas limit

Issue:

`add(uint256 _allocPoint, ...)`, `set(uint256 _pid, ...)` and `updateEmissionRate()` could invoke `massUpdatePools()` function, that can fail due to block gas limit if the pool size is too big.

# Conclusion

Smart contracts do not contain high severity issues.

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## *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.*