

# 0xNINJA AUDITS



Security Assessment  
**GhostPad Token**

October 25, 2022



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# Assessment Summary

This report has been prepared for GhostPad Token on the Binance Smart Chain network. CFGNINJA provides both client-centered and user-centered examination of the smart contracts and their current status when applicable. This report represents the security assessment made to find issues and vulnerabilities on the source code along with the current liquidity and token holder statistics of the protocol.

A comprehensive examination has been performed, utilizing Cross Referencing, Static Analysis, In-House Security Tools, and line-by-line Manual Review.






The auditing process pays special attention to the following considerations:

- Testing the smart contracts against both common and uncommon attack vectors.
- Inspecting liquidity and holders statistics to inform the current status to both users and client when applicable.
- Assessing the codebase to ensure compliance with current best practices and industry standards.
- Verifying contract functions that allow trusted and/or untrusted actors to mint, lock, pause, and transfer assets.
- Cross referencing contract structure and implementation against similar smart contracts produced by industry leaders
- Thorough line-by-line manual review of the entire codebase by industry experts.








# Technical Findings Summary

## Classification of Risk

Severity	Description
 Critical	Risks are those that impact the safe functioning of a platform and must be addressed before launch. Users should not invest in any project with outstanding critical risks.
 Major	Risks can include centralization issues and logical errors. Under specific circumstances, these major risks can lead to loss of funds and/or control of the project.
 Medium	Risks may not pose a direct risk to users' funds, but they can affect the overall functioning of a platform
 Minor	Risks can be any of the above but on a smaller scale. They generally do not compromise the overall integrity of the Project, but they may be less efficient than other solutions.
 Informational	Errors are often recommended to improve the code's style or certain operations to fall within industry best practices. They usually do not affect the overall functioning of the code.

## Findings

Severity	Found	Pending	Resolved
 Critical	0	0	0
 Major	0	0	0
 Medium	0	0	0
 Minor	1	1	0
 Informational	0	0	0
Total	1	0	0



# Project Overview

## Token Summary

Parameter	Result
Address	0x8A5E29bD75F11231c700D19F22ee644036F822ff
Name	GhostPad
Token Tracker	GhostPad (GTP)
Decimals	18
Supply	111,111,111
Platform	Binance Smart Chain
compiler	v0.8.17+commit.8df45f5f
Contract Name	GhostPad
Optimization	Yes with 200 runs
LicenseType	MIT
Language	Solidity
Codebase	<a href="https://bscscan.com/address/#code">https://bscscan.com/address/#code</a>
Payment Tx	0xc275f3bc016310b717c4ecd88dee75c58eb5d8dc25fe64accf2de4941e20805e



# Project Overview

## Risk Analysis Summary

Parameter	Result
Buy Tax	0%
Sale Tax	3%
Is honeypot?	Clean
Can edit tax?	Yes
Is anti whale?	No
Is blacklisted?	No
Is whitelisted?	No
Holders	Clean
Security Score	97/100
Auditor Score	97/100
Confidence Level	High

The following quick summary it's added to the project overview; however, there are more details about the audit and its results. Please read every detail.





## Main Contract Assessed Contract Name

Name	Contract	Live
GhostPad	0x8A5E29bD75F11231c700D19F22ee644036F822ff	No

## TestNet Contract Assessed Contract Name

Name	Contract	Live
GhostPad	00x2B56fB59fB8fC3Dd7237d92E19C4b6d044F83AAF	No

## Solidity Code Provided

SolID	File Sha-1	FileName
ghostpad	57522780cba216e3d628684345639a4f7433a03a	ghostpad.sol



# Mint Check

**The project owners of GhostPad do not have a mint function in the contract, owner cannot mint tokens after initial deploy.**

**The Project has a Total Supply of 111,111,111 and cannot mint any more than the Max Supply.**

Mint Notes:

Auditor Notes:

Project Owner Notes:





# Fees Check

**The project owners of GhostPad do not have the ability to set fees higher than 25% .**

**The team May have fees defined; however, they can't set those fees higher than 25% or may not be able to configure the same.**

**Tax Fee Notes:**

**Auditor Notes:** The contract currently has 5% buy and 5% sale taxes, and cannot be set higher than 10%

**Project Owner Notes:** .



**Fees can be changed up to a maximum of 25%**



# Blacklist Check

**The project owners of GhostPad do not have a blacklist function their contract.**

**The Project allow owners to transfer their tokens without any restrictions.**

**Token owner cannot blacklist the contract: Malicious or compromised owners can trap contracts relying on tokens with a blacklist.**

Blacklist Notes:

Auditor Notes:

Project Owner Notes: undefined



# MaxTx Check

**The Project Owners of GhostPad cannot set max tx amount**

**The Team allows any investors to swap, transfer or sell their total amount if needed.**

MaxTX Notes:

Auditor Notes:

Project Owner Notes:

**Project Has No MaxTX**



# Pause Trade Check

**The Project Owners of GhostPad don't have the ability to stop or pause trading.**

**The Team has done a great job to avoid stop trading, and investors has the ability to trade at any given time without any problems**

Pause Trade Notes:

Auditor Notes: .

Project Owner Notes:



Owner can't pause trading



# Contract Ownership

The contract ownership of GhostPad is not currently renounced. The ownership of the contract grants special powers to the protocol creators, making them the sole addresses that can call sensible ownable functions that may alter the state of the protocol.

The current owner is the address  
0x13c92077772ea92c67e45e7d22f63593cf9f8471  
which can be viewed:  
[HERE](#)

The owner wallet has the power to call the functions displayed on the privileged functions chart below, if the owner's wallet is compromised, they could exploit these privileges.

We recommend the team renounce ownership at the right time, if possible, or gradually migrate to a timelock with governing functionalities regarding transparency and safety considerations.

We recommend the team use a Multisignature Wallet if the contract is not going to be renounced; this will give the team more control over the contract.



# Liquidity Ownership

The token does not have liquidity at the moment of the audit, block 22279180

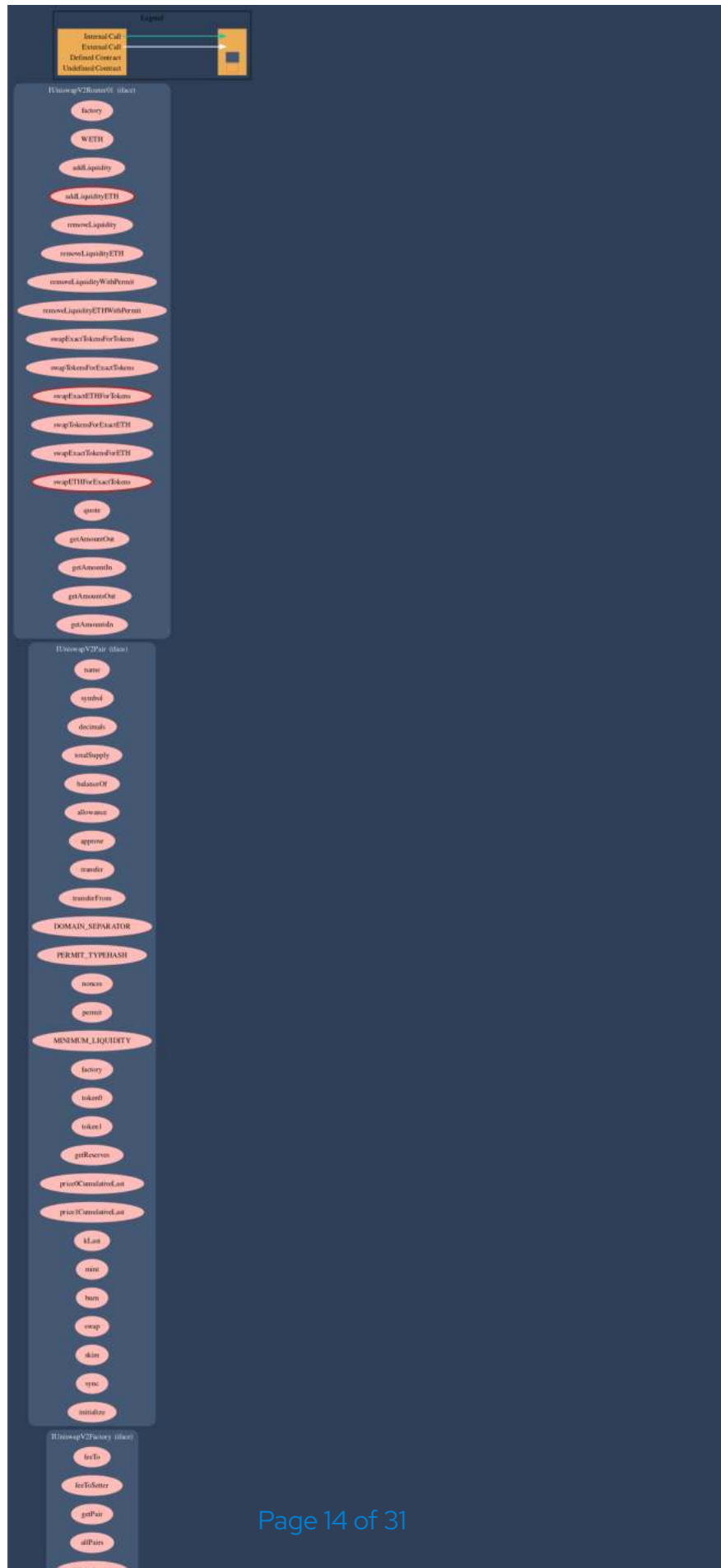
If liquidity is unlocked, then the token developers can do what is infamously known as 'rugpull'. Once investors start buying token from the exchange, the liquidity pool will accumulate more and more coins of established value (e.g., ETH or BNB or Tether). This is because investors are basically sending these tokens of value to the exchange, to get the new token. Developers can withdraw this liquidity from the exchange, cash in all the value and run off with it. Liquidity is locked by renouncing the ownership of liquidity pool (LP) tokens for a fixed time period, by sending them to a time-lock smart contract. Without ownership of LP tokens, developers cannot get liquidity pool funds back. This provides confidence to the investors that the token developers will not run away with the liquidity money. It is now a standard practice that all token developers follow, and this is what really differentiates a scam coin from a real one.

[Read More](#)



# Call Graph

The contract for GhostPad has the following call graph structure.





# KYC Information

**The Project Owners of GhostPad is not KYC.**

KYC Information Notes:

Auditor Notes: No KYC Provided

Project Owner Notes:



# Smart Contract Vulnerability Checks

ID	Severity	Name	File	location
SWC-100	Pass	Function Default Visibility	ghostpad.sol	L: 0 C: 0
SWC-101	Pass	Integer Overflow and Underflow.	ghostpad.sol	L: 0 C: 0
SWC-102	Pass	Outdated Compiler Version file.	ghostpad.sol	L: 0 C: 0
SWC-103	Low	A floating pragma is set.	ghostpad.sol	L: 3 C: 0
SWC-104	Pass	Unchecked Call Return Value.	ghostpad.sol	L: 0 C: 0
SWC-105	Pass	Unprotected Ether Withdrawal.	ghostpad.sol	L: 0 C: 0
SWC-106	Pass	Unprotected SELFDESTRUCT Instruction	ghostpad.sol	L: 0 C: 0
SWC-107	Pass	Read of persistent state following external call.	ghostpad.sol	L: 0 C: 0
SWC-108	Low	State variable visibility is not set..	ghostpad.sol	L: 101 C: 30,L: 152 C: 9
SWC-109	Pass	Uninitialized Storage Pointer.	ghostpad.sol	L: 0 C: 0
SWC-110	Pass	Assert Violation.	ghostpad.sol	L: 0 C: 0
SWC-111	Pass	Use of Deprecated Solidity Functions.	ghostpad.sol	L: 0 C: 0
SWC-112	Pass	Delegate Call to Untrusted Callee.	ghostpad.sol	L: 0 C: 0



ID	Severity	Name	File	location
SWC-113	Pass	Multiple calls are executed in the same transaction.	ghostpad.sol	L: 0 C: 0
SWC-114	Pass	Transaction Order Dependence.	ghostpad.sol	L: 0 C: 0
SWC-115	Low	Authorization through tx.origin.	ghostpad.sol	L: 455 C: 15
SWC-116	Pass	A control flow decision is made based on The block.timestamp environment variable.	ghostpad.sol	L: 0 C: 0
SWC-117	Pass	Signature Malleability.	ghostpad.sol	L: 0 C: 0
SWC-118	Pass	Incorrect Constructor Name.	ghostpad.sol	L: 0 C: 0
SWC-119	Pass	Shadowing State Variables.	ghostpad.sol	L: 0 C: 0
SWC-120	Low	Potential use of block.number as source of randomness.	ghostpad.sol	L: 582 C: 49
SWC-121	Pass	Missing Protection against Signature Replay Attacks.	ghostpad.sol	L: 280 C: 31
SWC-122	Pass	Lack of Proper Signature Verification.	ghostpad.sol	L: 0 C: 0
SWC-123	Low	Requirement Violation.	ghostpad.sol	L: 280 C: 31, L: 142 C: 0
SWC-124	Pass	Write to Arbitrary Storage Location.	ghostpad.sol	L: 0 C: 0
SWC-125	Pass	Incorrect Inheritance Order.	ghostpad.sol	L: 0 C: 0
SWC-126	Pass	Insufficient Gas Griefing.	ghostpad.sol	L: 0 C: 0



ID	Severity	Name	File	location
SWC-127	Pass	Arbitrary Jump with Function Type Variable.	ghostpad.sol	L: 0 C: 0
SWC-128	Pass	DoS With Block Gas Limit.	ghostpad.sol	L: 0 C: 0
SWC-129	Pass	Typographical Error.	ghostpad.sol	L: 0 C: 0
SWC-130	Pass	Right-To-Left-Override control character (U+202E).	ghostpad.sol	L: 0 C: 0
SWC-131	Pass	Presence of unused variables.	ghostpad.sol	L: 0 C: 0
SWC-132	Pass	Unexpected Ether balance.	ghostpad.sol	L: 0 C: 0
SWC-133	Pass	Hash Collisions with Multiple Variable Length Arguments.	ghostpad.sol	L: 0 C: 0
SWC-134	Pass	Message call with hardcoded gas amount.	ghostpad.sol	L: 0 C: 0
SWC-135	Pass	Code With No Effects (Irrelevant/Dead Code).	ghostpad.sol	L: 0 C: 0
SWC-136	Pass	Unencrypted Private Data On-Chain.	ghostpad.sol	L: 0 C: 0

We scan the contract for additional security issues using MYTHX and industry-standard security scanning tools.



# Smart Contract Vulnerability Details

## SWC-103 - Floating Pragma.

### CWE-664: Improper Control of a Resource Through its Lifetime.

#### References:

#### Description:

Contracts should be deployed with the same compiler version and flags that they have been tested with thoroughly. Locking the pragma helps to ensure that contracts do not accidentally get deployed using, for example, an outdated compiler version that might introduce bugs that affect the contract system negatively.

#### Remediation:

Lock the pragma version and also consider known bugs (<https://github.com/ethereum/solidity/releases>) for the compiler version that is chosen.

Pragma statements can be allowed to float when a contract is intended for consumption by other developers, as in the case with contracts in a library or EthPM package. Otherwise, the developer would need to manually update the pragma in order to compile locally.

#### References:

Ethereum Smart Contract Best Practices - Lock pragmas to specific compiler version.



# Smart Contract Vulnerability Details

## SWC-108 - State Variable Default Visibility

### CWE-710: Improper Adherence to Coding Standards

#### Description:

Labeling the visibility explicitly makes it easier to catch incorrect assumptions about who can access the variable.

#### Remediation:

Variables can be specified as being public, internal or private. Explicitly define visibility for all state variables.

#### References:

Ethereum Smart Contract Best Practices - Explicitly mark visibility in functions and state variables



# Smart Contract Vulnerability Details

## SWC-115 - Authorization through tx.origin

### CWE-477: Use of Obsolete Function

#### Description:

tx.origin is a global variable in Solidity which returns the address of the account that sent the transaction. Using the variable for authorization could make a contract vulnerable if an authorized account calls into a malicious contract. A call could be made to the vulnerable contract that passes the authorization check since tx.origin returns the original sender of the transaction which in this case is the authorized account.

#### Remediation:

tx.origin should not be used for authorization. Use msg.sender instead.

#### References:

Solidity Documentation - tx.origin

Ethereum Smart Contract Best Practices - Avoid using tx.origin

SigmaPrime - Visibility.





# Smart Contract Vulnerability Details

## SWC-120 – Weak Sources of Randomness from Chain Attributes

### CWE-330: Use of Insufficiently Random Values

#### Description:

Solidity allows for ambiguous naming of state variables when inheritance is used. Contract A with a variable x could inherit contract B that also has a state variable x defined. This would result in two separate versions of x, one of them being accessed from contract A and the other one from contract B. In more complex contract systems this condition could go unnoticed and subsequently lead to security issues.

Shadowing state variables can also occur within a single contract when there are multiple definitions on the contract and function level.

#### Remediation:

Using commitment scheme, e.g. RANDAO. Using external sources of randomness via oracles, e.g. Oraclize. Note that this approach requires trusting in oracle, thus it may be reasonable to use multiple oracles. Using Bitcoin block hashes, as they are more expensive to mine.

#### References:

How can I securely generate a random number in my smart contract?)

When can BLOCKHASH be safely used for a random number? When would it be unsafe?

The Run smart contract.



# Smart Contract Vulnerability Details

## SWC-123 - Requirement Violation

### CWE-573: Improper Following of Specification by Caller

#### Description:

The Solidity `require()` construct is meant to validate external inputs of a function. In most cases, such external inputs are provided by callers, but they may also be returned by callees. In the former case, we refer to them as precondition violations. Violations of a requirement can indicate one of two possible issues:

- A bug exists in the contract that provided the external input.
- The condition used to express the requirement is too strong.

#### Remediation:

If the required logical condition is too strong, it should be weakened to allow all valid external inputs. Otherwise, the bug must be in the contract that provided the external input and one should consider fixing its code by making sure no invalid inputs are provided.

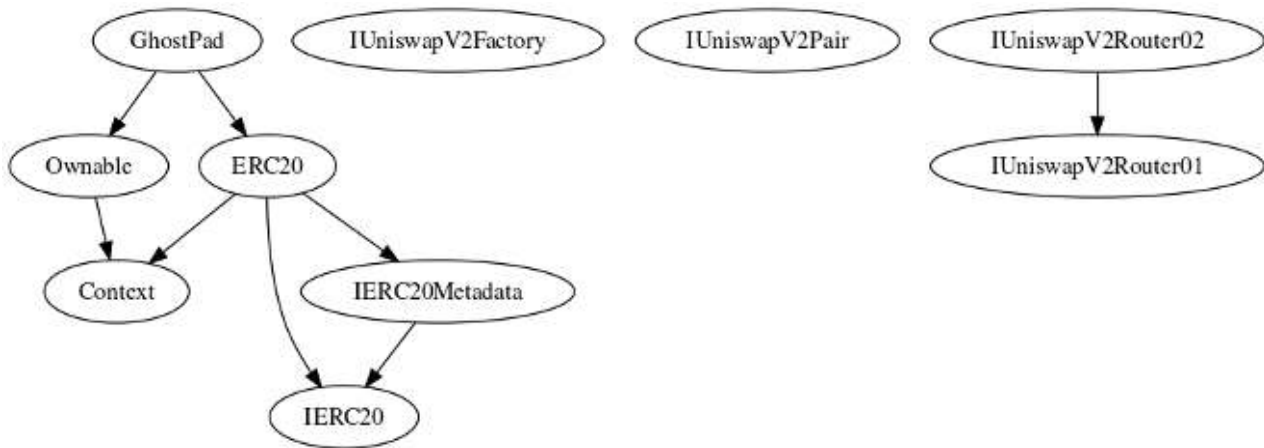
#### References:

The use of `revert()`, `assert()`, and `require()` in Solidity, and the new REVERT opcode in the EVM



# Inheritance

The contract for GhostPad has the following inheritance structure.



## Privileged Functions (onlyOwner)

Function Name	Parameters	Visibility
renounceOwnership		public
transferOwnership	account (address)	external
claimStuckTokens		external
excludeFromFees		external
changeMarketingWallet		external
setSwapTokensAtAmount		external



## Assessment Results

- The contract was developed by Roman Candles and has been peer-reviewed by Bladepool.
- The contract has 0% buy and Sale and can be increased up to 3%, the fees are only for marketing purposes.
- Security Vulnerabilities have not been found and no major issues during the advance check and testing of the contract.
- No high-risk Exploits/Vulnerabilities Were Found in the Source Code.

## Audit Passed





# Smart Contract Advance Checks

ID	Severity	Name	Result	Status
GTP-01	Minor	Potential Sandwich Attacks.	Fail	Acknowledged
GTP-02	Informational	Function Visibility Optimization	Pass	Acknowledged
GTP-03	Minor	Lack of Input Validation.	Pass	Pending
GTP-04	Major	Centralized Risk In addLiquidity.	Pass	Resolved
GTP-05	Major	Missing Event Emission.	Pass	Pending
GTP-06	Minor	Conformance with Solidity Naming Conventions.	Pass	Pending
GTP-07	Major	State Variables could be Declared Constant.	Pass	Pending
GTP-08	Major	Dead Code Elimination.	Pass	Pending
GTP-09	Major	Third Party Dependencies.	Pass	Pending
GTP-10	Major	Initial Token Distribution.	Pass	Pending
GTP-11	Major	Modification of Math Library	Pass	Pending
GTP-12	Major	Centralization Risks In The X Role	Pass	Pending
GTP-13	Informational	Extra Gas Cost For User..	Pass	Pending

During our assessment review, we manually check against the following test cases, this help us identify potential missing items from any automated tools. Is an additional safety measure to ensure the contract is safe and follow industry standards.



## GTP-01 | Potential Sandwich Attacks.

Category	Severity	Location	Status
Security	 Minor	ghostpad.sol: 601,13	 Acknowledged

### Description

A sandwich attack might happen when an attacker observes a transaction swapping tokens or adding liquidity without setting restrictions on slippage or minimum output amount. The attacker can manipulate the exchange rate by frontrunning (before the transaction being attacked) a transaction to purchase one of the assets and make profits by back running (after the transaction being attacked) a transaction to sell the asset. The following functions are called without setting restrictions on slippage or minimum output amount, so transactions triggering these functions are vulnerable to sandwich attacks, especially when the input amount is large:

- swapExactTokensForETHSupportingFeeOnTransferTokens()
- addLiquidityETH()

### Remediation

We recommend setting reasonable minimum output amounts, instead of 0, based on token prices when calling the aforementioned functions.

### References:

What Are Sandwich Attacks in DeFi – and How Can You Avoid Them?.





# Social Media Checks

Social Media	URL	Result
Twitter		Pending
Other		Pending
Website	<a href="https://ghostpad.app/#">https://ghostpad.app/#</a>	Pass
Telegram		Pending

We recommend to have 3 or more social media sources including a completed working websites.

**Social Media Information Notes:**

**Auditor Notes:** undefined

**Project Owner Notes:**



# Appendix

## Finding Categories

### Centralization / Privilege

Centralization / Privilege findings refer to either feature logic or implementation of components that act against the nature of decentralization, such as explicit ownership or specialized access roles in combination with a mechanism to relocate funds.

### Gas Optimization

Gas Optimization findings do not affect the functionality of the code but generate different, more optimal EVM opcodes resulting in a reduction on the total gas cost of a transaction.

### Logical Issue

Logical Issue findings detail a fault in the logic of the linked code, such as an incorrect notion on how block.timestamp works.

### Control Flow

Control Flow findings concern the access control imposed on functions, such as owner-only functions being invoke-able by anyone under certain circumstances.

### Volatile Code

Volatile Code findings refer to segments of code that behave unexpectedly on certain edge cases that may result in a vulnerability.

### Coding Style

Coding Style findings usually do not affect the generated byte-code but rather comment on how to make the codebase more legible and, as a result, easily maintainable.

### Inconsistency

Inconsistency findings refer to functions that should seemingly behave similarly yet contain different code, such as a constructor assignment imposing different requirements on the input variables than a setter function.

### Coding Best Practices

ERC 20 Coding Standards are a set of rules that each developer should follow to ensure the code meets a set of criteria and is readable by all the developers.



# Disclaimer

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