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**Blockchain Security | Smart Contract Audits | KYC
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MADE IN GERMANY

NeutroSwap Audit

**Security Assessment
14. April, 2023**

For

 neutroswap



SolidProof_io



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Version	Date	Description
1.0	12. April 2023 - 14. April 2023	<ul style="list-style-type: none">• Layout project• Automated- /Manual-Security Testing• Summary

Network

EOS

Website

<https://neutroswap.io/>

Medium

<https://medium.com/@Neutroswap>

Twitter

<https://mobile.twitter.com/Neutroswap>

Discord

<https://discord.com/invite/xM9dkUv>



Description

Neutroswap is a community-driven automated market-maker (AMM) operating on the EOS EVM blockchain, providing users with the lowest fees for swapping assets. The platform offers some of the most profitable rewards for staking and yield farming in the entire EOS EVM ecosystem, making it an attractive option for those looking to earn returns on their assets.

Project Engagement

During the 11th of April 2023, **NeutroSwap Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

Logo



Contract Links

v1.0

Provided as Files

Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
Critical	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
High	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
Medium	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
Low	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
Informational	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
 - i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
 - ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
 - iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.
2. Testing and automated analysis that includes the following:
 - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
 - ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

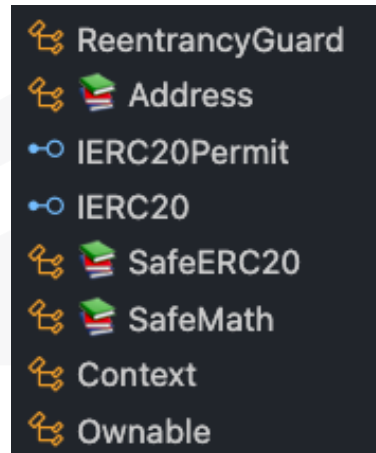
Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

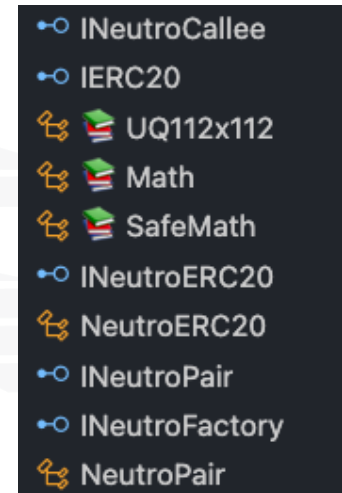
NeutroChef



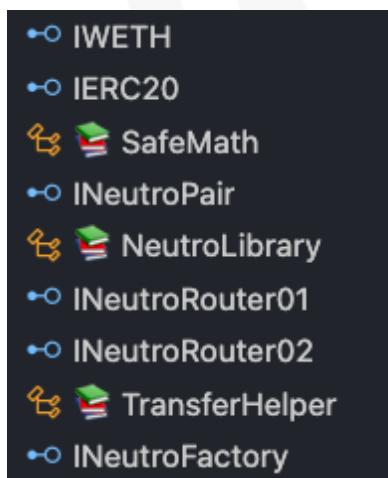
NeutroEarn



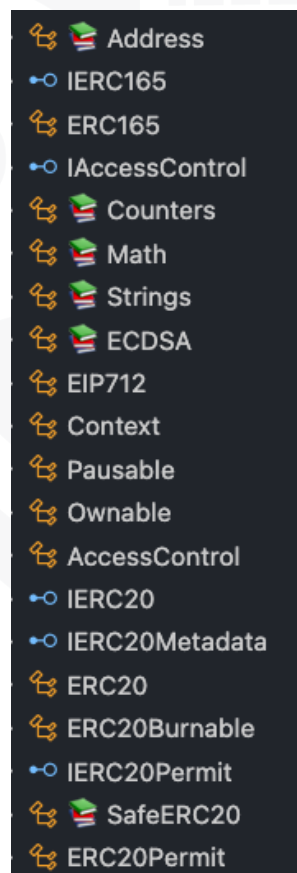
NeutroFactory



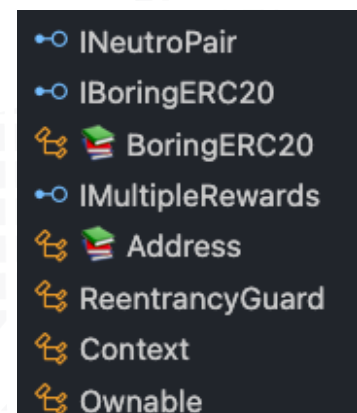
NeutroRouter



NeutroToken



NeutroVault



Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

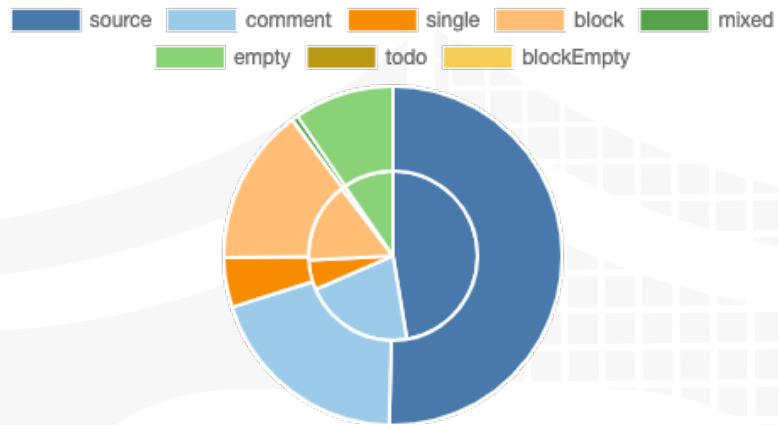
A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.

v1.0

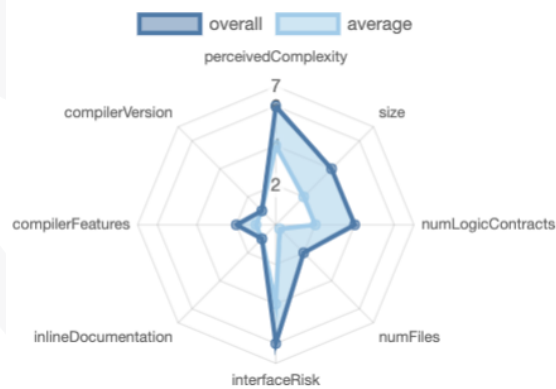
File Name	SHA-1 Hash
contracts/ NeutroFactory.sol	eaae3fbba2fb362508a16e34b9dfdcc59b350 e9d
contracts/ NeutroChef.sol	961706aac4cbe59a0d640544ec4bb9af1183 e5d1
contracts/ NeutroToken.sol	1215ddda26c0cf181e0a815782b5e9bbcb26 4551
contracts/ NeutroEarn.sol	70f93a104c86fee5d0f60c990b198b6c75bfb d0d
contracts/ NeutroRouter.sol	3535fe85aff20755a50e91bc46bc7de6600a9 c50
contracts/ NeutroVault.sol	1cbf7fcc31488eda0632a78aaf1e1013e1cdc 34a

Metrics

Source Lines v1.0



Risk Level v1.0



Capabilities

Components

 Contracts	 Libraries	 Interfaces	 Abstract
9	19	24	17

Exposed Functions

This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.





 Public	 Payable
319	10







External	Internal	Private	Pure	View
235	469	19	88	168



StateVariables

Total	 Public
119	68

Capabilities

Solidity Versions observed	 Experimental Features	 Can Receive Funds	 Uses Assembly	 Has Destroyable Contracts
<div><div>>=0.5.0</div><div>=0.5.16</div><div>0.8.16</div><div>^0.8.1</div><div>^0.8.0</div><div>=0.6.6</div><div>>=0.6.2</div><div>>=0.6.0</div></div>		<div>yes</div>	<div>yes</div> <div>(12 asm blocks)</div>	

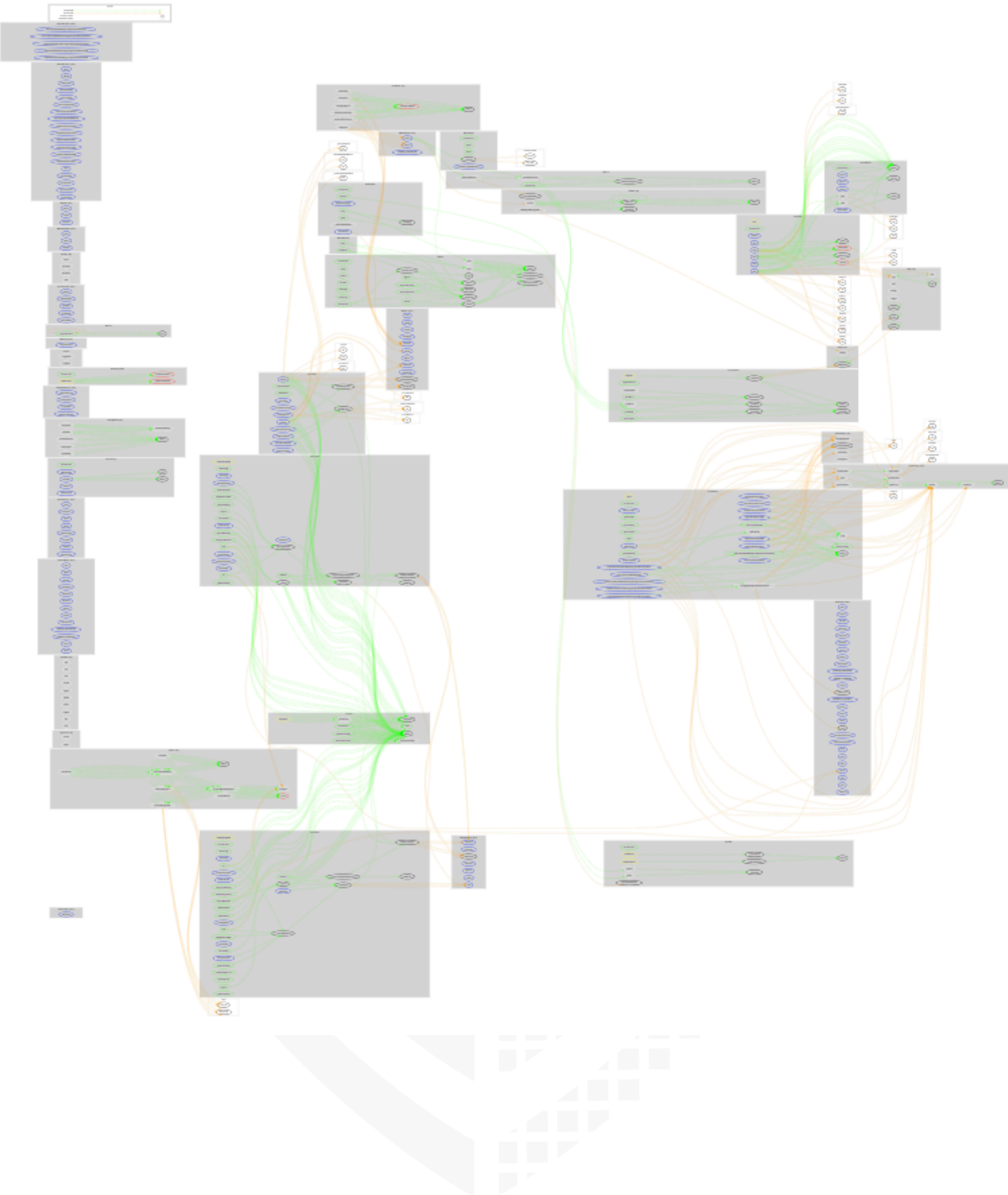
 Transfers ETH	 Low-Level Calls	 DelegateCall	 Uses Hash Functions	 ECRcover	 New/Create/Create2
<div>yes</div>		<div>yes</div>	<div>yes</div>	<div>yes</div>	<div>yes</div> <div>→ AssemblyCall:Name:create2</div>

 TryCatch	 Unchecked
	<div>yes</div>

Inheritance Graph

v1.0





Scope of Work/Verify Claims

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Overall checkup (Smart Contract Security)



Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	⚠
Unverified / Not checked	✗
Not available	—

Modifiers and public functions v1.0

NeutroChef

- ⚡ **startFarming**
- Ⓜ onlyOwner
- ⚡ **add**
- Ⓜ onlyOwner
- ⚡ **set**
- Ⓜ onlyOwner
- Ⓜ validatePoolByPid
- ⚡ **massUpdatePools**
- Ⓜ nonReentrant
- ⚡ **updatePool**
- Ⓜ nonReentrant
- ⚡ **depositWithPermit**
- Ⓜ nonReentrant
- Ⓜ validatePoolByPid
- ⚡ **deposit**
- Ⓜ nonReentrant
- ⚡ **withdraw**
- Ⓜ nonReentrant
- Ⓜ validatePoolByPid
- ⚡ **emergencyWithdraw**
- Ⓜ nonReentrant
- ⚡ **updateAllocPoint**
- Ⓜ onlyOwner
- ⚡ **updateEmissionRate**
- Ⓜ onlyOwner
- ⚡ **harvestMany**
- Ⓜ nonReentrant
- ⚡ **setMarketingAddress**
- Ⓜ onlyOwner
- ⚡ **setTeamAddress**
- Ⓜ onlyOwner
- ⚡ **setMarketingPercent**
- Ⓜ onlyOwner
- ⚡ **setTeamPercent**
- Ⓜ onlyOwner
- ⚡ **setFeeAddress**
- Ⓜ onlyOwner

NeutroEarn

- ⚡ **deposit**
- Ⓜ nonReentrant
- ⚡ **addRewardToken**
- Ⓜ onlyOwner
- ⚡ **removeRewardToken**
- Ⓜ onlyOwner
- ⚡ **setDepositFeePercent**
- Ⓜ onlyOwner
- ⚡ **withdraw**
- Ⓜ nonReentrant
- ⚡ **updateReward**
- ⚡ **changeCooldown**
- Ⓜ onlyOwner

NeutroToken

- ⚡ **mint**
- Ⓜ onlyRole
- ⚡ **pause**
- Ⓜ onlyRole
- ⚡ **unpause**
- Ⓜ onlyRole
- ⚡ **rescueTokens**
- Ⓜ onlyRole

NeutroVault

- ⚡ **startFarming**
- Ⓜ onlyOwner
- ⚡ **add**
- Ⓜ onlyOwner
- ⚡ **set**
- Ⓜ onlyOwner
- Ⓜ validatePoolByPid
- ⚡ **massUpdatePools**
- Ⓜ nonReentrant
- ⚡ **updatePool**
- Ⓜ nonReentrant
- ⚡ **depositWithPermit**
- Ⓜ nonReentrant
- Ⓜ validatePoolByPid
- ⚡ **deposit**
- Ⓜ nonReentrant
- ⚡ **withdraw**
- Ⓜ nonReentrant
- Ⓜ validatePoolByPid
- ⚡ **emergencyWithdraw**
- Ⓜ nonReentrant
- ⚡ **updateAllocPoint**
- Ⓜ onlyOwner
- ⚡ **updateEmissionRate**
- Ⓜ onlyOwner
- ⚡ **harvestMany**
- Ⓜ nonReentrant

Note:

- General fork from ZyberSwap
 - Contracts inside are the same as the zyberSwap contracts
 - Differences between Neutroswap and ZyberSwap contracts are the following:
 - Only Name changes in the cotntracts

Ownership Privileges

- [NeutroToken.sol](#)
 - The addresses with the minter role can mint tokens until the maximum supply is reached
 - Pauser role address can pause/unpause the token contract
- [NeutroChef.sol](#)
 - Add a new pool
 - Start farming in the farm contract, add new LP to the pool
 - Set deposit fees, harvest interval, and allocation point
 - Update allocation points, emission rate to any arbitrary value.
 - Set marketing address, team address, and fee address.
 - Set marketing and team percentage in fees but not more than 20%
 - Update pool/pools
- [NeutroChef.sol](#)
- The contracts are identical fork from zyberswap and have the same ownership Privileges

Please check if an OnlyOwner or similar restrictive modifier has been forgotten.

Source Units in Scope v1.0

File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score
contracts/NeutroFactory.sol	6	5	819	540	440	59	434
contracts/NeutroChef.sol	6	3	1449	1229	778	308	543
contracts/NeutroToken.sol	16	5	2538	2219	943	1238	655
contracts/NeutroEarn.sol	7	2	1351	1153	532	587	303
contracts/NeutroRouter.sol	4	6	1278	628	543	38	577
contracts/NeutroVault.sol	6	3	1388	1165	729	309	513
Totals	45	24	8823	6934	3965	2539	3025

Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalised lines of the source unit (e.g. normalises functions spanning multiple lines)
nSLOC	normalised source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

Audit Results

Critical issues

No critical issues

High issues

No high issues

Medium issues

No medium issues

Low issues

Issue	File	Type	Line	Description
#1	All	Multiple pragma is set	—	Some of the contracts contain different pragma versions which is not recommended for deployment. We recommend to have the same pragma in all contracts and also to update the old pragma versions to the new ones.

Informational issues

Issue	File	Type	Line	Description
#1	All	Contract doesn't import npm packages from source (like OpenZeppelin etc.)	—	We recommend importing all packages from npm directly without flattening the contract. Functions could be modified or can be susceptible to vulnerabilities

Audit Comments

We recommend you to use the special form of comments (NatSpec Format, Follow link for more information <https://docs.soliditylang.org/en/latest/natspec-format.html>) for your contracts to provide rich

documentation for functions, return variables and more. This helps investors to make clear what that variables, functions etc. do.

14. April 2023:

- This project consists of the following forks
 - ZyberSwap
- Read whole report and modifiers section for more information
- The low issues that exist in the ZyberSwap codebase still exist in the forked code.
- We recommend using a multisig wallet for the owner address to prevent any risk of the loss of private key
- Do your own research here



SWC Attacks

ID	Title	Relationships	Status
SW C-1 36	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SW C-1 35	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SW C-1 34	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SW C-1 33	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SW C-1 32	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SW C-1 31	Presence of unused variables	CWE-1164: Irrelevant Code	PASSED
SW C-1 30	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SW C-1 29	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SW C-1 28	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED

SW C-1 27	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SW C-1 25	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SW C-1 24	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SW C-1 23	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SW C-1 22	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SW C-1 21	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SW C-1 20	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
SW C-11 9	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	PASSED
SW C-11 8	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
SW C-11 7	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED

SW C-11 6	Timestamp Dependence	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SW C-11 5	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
SW C-11 4	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
SW C-11 3	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
SW C-11 2	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SW C-11 1	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
SW C-11 0	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
SW C-1 09	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SW C-1 08	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED
SW C-1 07	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
SW C-1 06	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED

SW C-1 05	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
SW C-1 04	Unchecked Call Return Value	CWE-252: Unchecked Return Value	PASSED
SW C-1 03	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	NOT PASSED
SW C-1 02	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
SW C-1 01	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
SW C-1 00	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED

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