Blockchain Security & Audits

Seculite

Blockchain Security Company

ETCMC Audit

Security Assessment

10 December 2023

For

ETCMC

Seculite.net

SeculiteAudits

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Version	Date	Description
1.0	05 December 2023 - 10 December 2023	• Layout project • Automated- /Manual-Security Testing • Summary

Network

Ethereum Classic (ETC)

Website

https://etc-mc.com

Description

ETCMC is aiming to be one of the decentralised exchanges (DEX) with an automated market-maker (AMM) on the Ethereum Classic Blockchain.

Project Engagement

During the Date of 05 December 2023, **ETCMC Team** engaged Seculite 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 Seculite with access to their code repository.

Logo

ETCMC

Contract Link

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	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 pen testers 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:
   a. Review of the specifications, sources, and instructions provided to Seculite Solution to make sure we understand the size, scope, and functionality of the smart Contract.
   b. Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
   c. Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to Seculite Solution describe.
2. Testing and automated analysis that includes the following:
   a. 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.
   b. 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, itemised, actionable recommendations to help you take steps to secureyour smart contracts.

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

Imported Packages:

Dependency / Import Path	Count
@uniswap/lib/contracts/libraries/Babylonian.sol	2
@uniswap/lib/contracts/libraries/FixedPoint.sol	3
@uniswap/lib/contracts/libraries/FullMath.sol	1
@uniswap/lib/contracts/libraries/TransferHelper.sol	4
@uniswap/v2-core/contracts/interfaces/IUniswapV2Callee.sol	1
@uniswap/v2-core/contracts/interfaces/IUniswapV2Factory.sol	5
@uniswap/v2-core/contracts/interfaces/IUniswapV2Pair.sol	6

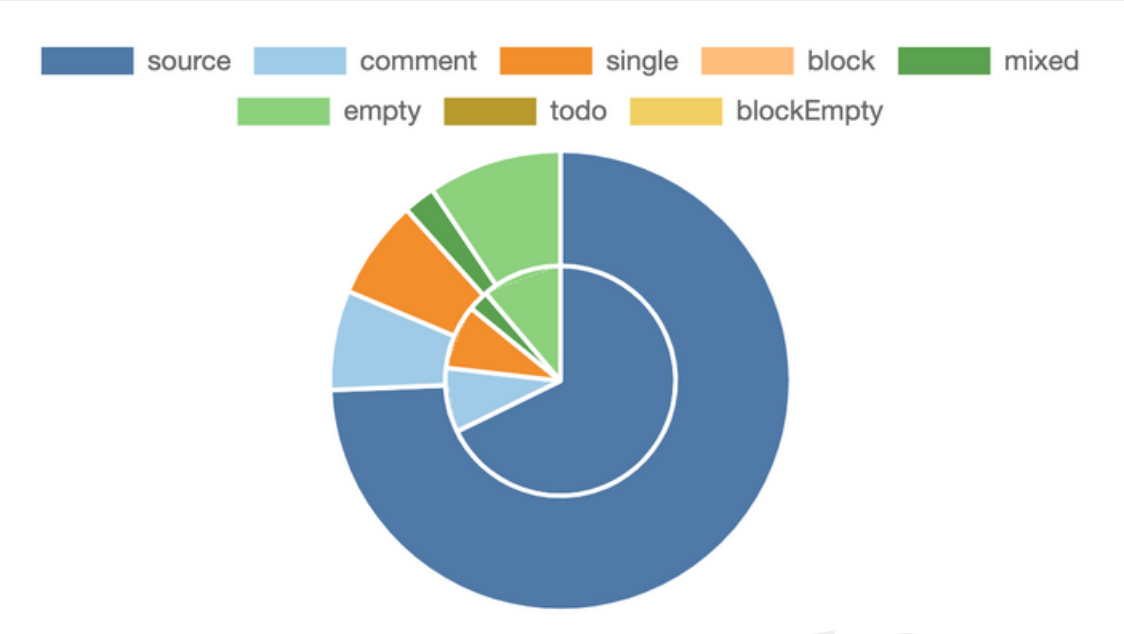
Tested Contract Files

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.

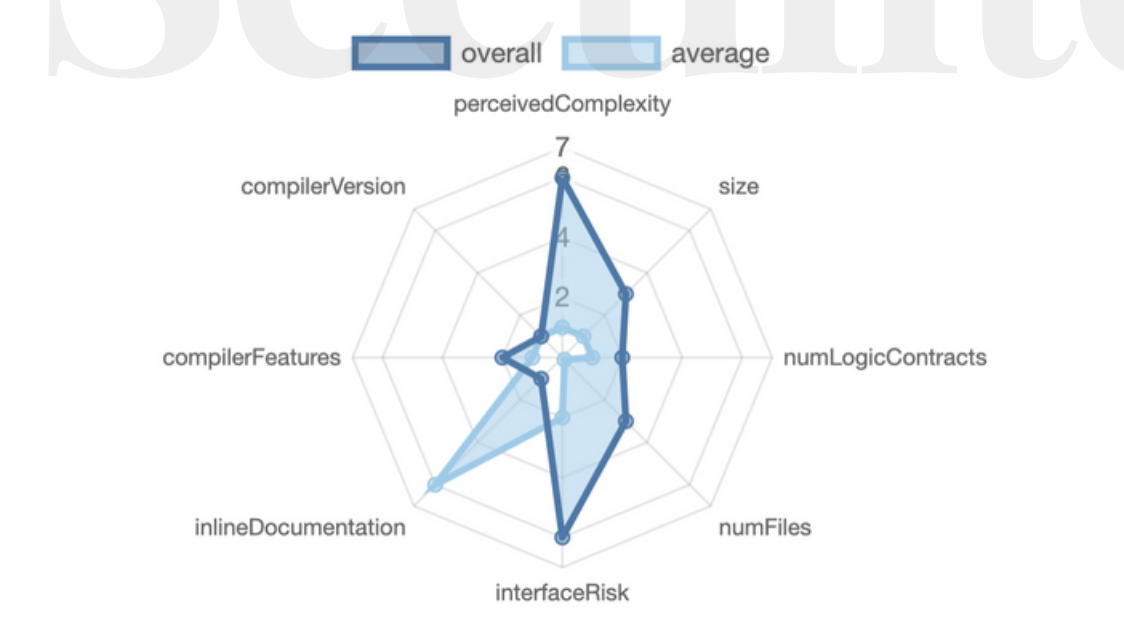
File Name	SHA-1 Hash
/v2-core/contracts/ETCMCV2ERC20.sol	ca6c7570818250030da10753fc6da7e34eda08df
/v2-core/contracts/interfaces/IUniswapV2ERC20.sol	a881fff951a6284f2fa04849ebda57783de3f02a
/v2-core/contracts/libraries/SafeMath.sol	97a5b17b0fd90ece89930aeff76cc32fef1a6f14
/v2-core/contracts/ETCMCV2Pair.sol	3009d94b5ec4bd6bb71aebd8fc6bd8a1c3b3d537
/v2-core/contracts/interfaces/IUniswapV2Pair.sol	e20da54f1aa3841c2b532d81cd6cbe2d251a6768
/v2-core/contracts/libraries/Math.sol	e6f63d883294ea708b0ab5ecee646f9fcac6722c
/v2-core/contracts/libraries/UQ112x112.sol	5c0f96357914f9f80b6d616b79ece099d5f91ec4
/v2-core/contracts/interfaces/IERC20.sol	b7d011aaabd34898ee60760996cb702e7b2ca855
/v2-core/contracts/interfaces/IUniswapV2Factory.sol	2c3596510104c4168977f19ff32c728982acf6f1
/v2-core/contracts/interfaces/IUniswapV2Callee.sol	c7e224344966e0cfad73f086da1a105cc8f24902
/v2-core/contracts/ETCMCV2Factory.sol	f333cfb986e620e2223d7325002d5779055a8740
/v2-periphery/contracts/ETCMCV2Router02.sol	ba9d01a09068bf370aafe5280496fc2c2d3433a1
/v2-periphery/contracts/interfaces/IUniswapV2Router02.sol	0d2ae53fa0c621cbc7e0e46e506c562068037f6c
/v2-periphery/contracts/interfaces/IUniswapV2Router01.sol	f150379f2a39f6d992f9a0aa35915ea1f64658d9
/v2-periphery/contracts/libraries/UniswapV2Library.sol	8768120636ff80c8e2b0dfc3329027c8dd1ba3a8
/v2-periphery/contracts/libraries/SafeMath.sol	123c932c8701c1178d049c82339bc68cd3c61d18
/v2-periphery/contracts/interfaces/IERC20.sol	b7d011aaabd34898ee60760996cb702e7b2ca855
/v2-periphery/contracts/interfaces/IWETH.sol	6a25dd53c8494e3aef3a520f17e00608b529f061
/v2-periphery/contracts/UniswapV2Migrator.sol	2dc1b4329313afcf4a68f6f240f8908652070a26
/v2-periphery/contracts/interfaces/IUniswapV2Migrator.sol	fe1d2218375f45b535aaed1e75809db201d7eaf6
/v2-periphery/contracts/interfaces/V1/IUniswapV1Factory.sol	41777838b683a6861b8f41d91a9b418eafd42526
/v2-periphery/contracts/interfaces/V1/IUniswapV1Exchange.sol	ba992548a32038fcca1cebdcfd4b11f81f726391
/v2-periphery/contracts/UniswapV2Router01.sol	0e67ac06da88be0fa56fe2fbf73be3cdd3580cb9

Metrics

Source Lines: v1.0



Risk Level: v1.0



Capabilities

Components

Version	📝 Contracts	📚 Libraries	🔍 Interfaces	🎨 Abstract
1.0	11	7	12	0

Exposed Functions

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

Version	🌐 Public	💰 Payable
1.0	182	17

Version	External	Internal	Private	Pure	View
1.0	153	136	9	38	60

State Variables

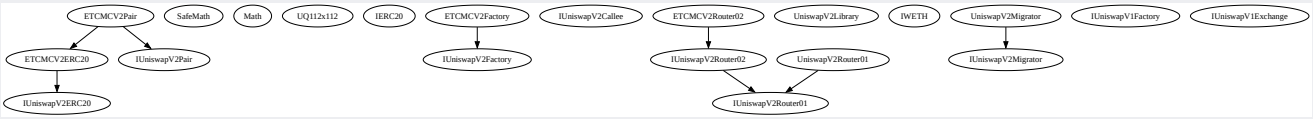
Version	Total	🌐 Public
1.0	53	41

Capabilities

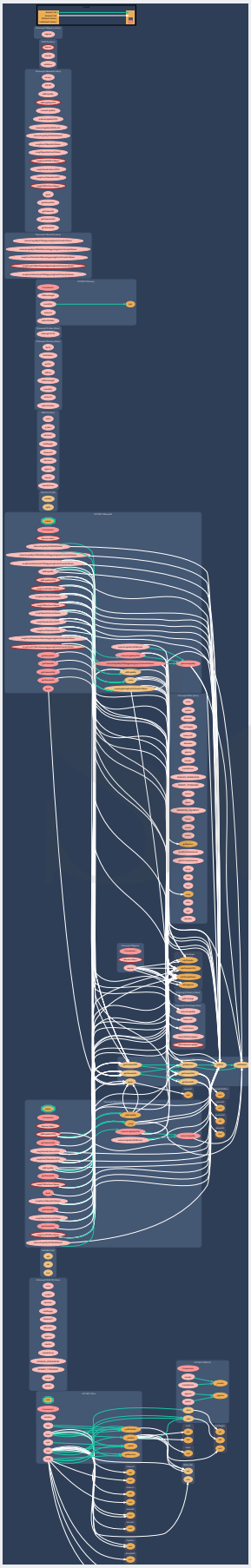
Solidity Versions observed	🧪 Experimental Features	💰 Can Receive Funds	🖥️ Uses Assembly	💣 Has Destroyable Contracts
`=0.6.6, =0.5.16, >=0.5.0, >=0.6.2`		yes	yes, (2 asm blocks)	

💸 Transfers ETH	⚡ Low-Level Calls	👥 DelegateCall	🧮 Uses Hash Functions	🧹 ECRecover	🌀 New/Create/Create2
yes			yes	yes	yes → AssemblyCall:Name:create2

Inheritance Graph



CallGraph



Scope of Work/Verify Claims

The above token Team provided us with the files that needs to be tested(Github, Bscscan, Etherscan, les, 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	✓
Parity Verified	⚑
Unverified / Not Verified	✗
Not available	-

Modifiers and public functions

ETCMCV2Factory.sol

- createPair
- setFeeTo
- setFeeToSetter

ETCMCV2ERC20.sol

- approve
- transfer
- transferFrom
- permit

ETCMCV2Pair.sol

- initialize
- mint
  - lock
- burn
  - lock
- swap
  - lock
- skim
  - lock
- sync
  - lock

ETCMCV2Router02.sol

- addLiquidity
  - ensure
- addLiquidityETH
  - ensure
- removeLiquidity
  - ensure
- removeLiquidityETH
  - ensure
- removeLiquidityWithPermit
- removeLiquidityETHWithPermit
- removeLiquidityETHSupportingFeeOnTransferTokens
  - ensure
- removeLiquidityETHWithPermitSupportingFeeOnTransferTokens
- swapExactTokensForTokens
  - ensure
- swapTokensForExactTokens
  - ensure
- swapExactETHForTokens
  - ensure
- swapTokensForExactETH
  - ensure
- swapExactTokensForETH
  - ensure
- swapETHForExactTokens
  - ensure
- swapExactTokensForTokensSupportingFeeOnTransferTokens
  - ensure
- swapExactETHForTokensSupportingFeeOnTransferTokens
  - ensure
- swapExactTokensForETHSupportingFeeOnTransferTokens
  - ensure

Note:

- General fork from uniswap/pancakeswap
- Dex/lib
  - Folders inside are the same as the uniswap-lib

Ownership Privileges:

- The owner can mint tokens in the 'BEP20.sol' and ZyberPair contracts.
- The "feeToSetter" address is able to set the fees receiving address.
- The owner is also able to burn tokens if the "unlocked" value is set to 1

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

Source Units in Scope v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
🔍	v2-core/contracts/interfaces/IUniswapV2Callee.sol	—	1	5	4	3	—	3	—
🔍	v2-core/contracts/interfaces/IUniswapV2Pair.sol	—	1	52	7	5	—	55	—
🔍	v2-core/contracts/interfaces/IUniswapV2Factory.sol	—	1	17	6	4	—	17	—
🔍	v2-core/contracts/interfaces/IUniswapV2ERC20.sol	—	1	23	7	5	—	27	—
🔍	v2-core/contracts/interfaces/IERC20.sol	—	1	17	7	5	—	19	—
📝	v2-core/contracts/ETCMCV2Factory.sol	1	—	51	51	41	2	53	🖥️🧮🌀
📝	v2-core/contracts/ETCMCV2ERC20.sol	1	—	94	94	79	1	61	🖥️🧮🧪
📚	v2-core/contracts/libraries/Math.sol	1	—	23	23	18	2	5	—
📚	v2-core/contracts/libraries/UQ112x112.sol	1	—	20	20	10	6	4	—
📚	v2-core/contracts/libraries/SafeMath.sol	1	—	17	17	12	1	4	—
📝	v2-core/contracts/ETCMCV2Pair.sol	1	—	201	201	167	34	184	🧮
🔍	v2-periphery/contracts/interfaces/IUniswapV2Migrator.sol	—	1	5	4	3	—	3	—
🔍	v2-periphery/contracts/interfaces/IWETH.sol	—	1	7	4	3	—	10	💰
🔍	v2-periphery/contracts/interfaces/IUniswapV2Router02.sol	—	1	44	6	4	—	16	💰
🔍	v2-periphery/contracts/interfaces/IUniswapV2Router01.sol	—	1	95	4	3	—	48	💰
🔍	v2-periphery/contracts/interfaces/IERC20.sol	—	1	17	7	5	—	19	—
🔍	v2-periphery/contracts/interfaces/V1/IUniswapV1Exchange.sol	—	1	9	4	3	—	14	💰
🔍	v2-periphery/contracts/interfaces/V1/IUniswapV1Factory.sol	—	1	5	4	3	—	3	—
📝	v2-periphery/contracts/UniswapV2Router01.sol	1	—	280	191	172	9	210	💰🔹
📝	v2-periphery/contracts/examples/ExampleComputeLiquidityValue.sol	1	—	90	61	49	4	18	—
📝	v2-periphery/contracts/examples/ExampleFlashSwap.sol	1	—	67	67	56	16	86	💰🔹
📚	v2-periphery/contracts/libraries/UniswapV2LiquidityMathLibrary.sol	1	—	139	106	72	15	54	—
📚	v2-periphery/contracts/libraries/SafeMath.sol	1	—	17	17	12	1	4	—
📚	v2-periphery/contracts/libraries/UniswapV2Library.sol	1	—	82	82	63	9	71	🧮
📚	v2-periphery/contracts/libraries/UniswapV2OracleLibrary.sol	1	—	35	33	20	8	14	—
📝	v2-periphery/contracts/examples/ExampleSlidingWindowOracle.sol	1	—	125	122	75	29	41	—
📝	v2-periphery/contracts/examples/ExampleSwapToPrice.sol	1	—	77	68	50	7	32	—
📝	v2-periphery/contracts/examples/ExampleOracleSimple.sol	1	—	67	67	49	10	37	—
📝	v2-periphery/contracts/ETCMCV2Router02.sol	1	—	446	286	258	14	310	💰🔹
📝	v2-periphery/contracts/UniswapV2Migrator.sol	1	—	49	46	37	4	33	💰
📝📚🔍	**Totals**	**18**	**12**	**2176**	**1616**	**1286**	**172**	**1455**	🖥️💰🔹🧮🧪🌀

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; nocomments, 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		Contract doesn't import npm packages from source (like OpenZeppelin etc.)	-	We recommend to import all packages from npm directly without flatten the contract. Functions could be modified or can be susceptible to vulnerabilities
#2	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.
#3	ETCMCV 2Pair.sol	Missing Zero Address Validation (missingzero-check)	66	Check that the address is not zero otherwise the amount will be lost
#4	ETCMCV 2Ro uter.sol	Missing Events Arithmetic	All	Emit an event for critical parameter changes

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.

SWC Attacks

ID	TITLE	RELATIONSHIPS	STATUS
SWC-136	Unencrypted Private Data On-Chain	CWE-767: Access to Critical Private Variable via Public Method	PASSED
SWC-135	Code With No Effects	CWE-1164: Irrelevant Code	PASSED
SWC-134	Message call with hardcoded gas amount	CWE-655: Improper Initialization	PASSED
SWC-133	Hash Collisions With Multiple Variable Length Arguments	CWE-294: Authentication Bypass by Capture-replay	PASSED
SWC-132	Unexpected Ether balance	CWE-667: Improper Locking	PASSED
SWC-131	Presence of unused variables	CWE-1164: Irrelevant Code	NOT PASSED
SWC-130	Right-To-Left-Override control character (U+202E)	CWE-451: User Interface (UI) Misrepresentation of Critical Information	PASSED
SWC-129	Typographical Error	CWE-480: Use of Incorrect Operator	PASSED
SWC-128	DoS With Block Gas Limit	CWE-400: Uncontrolled Resource Consumption	PASSED
SWC-127	Arbitrary Jump with Function Type Variable	CWE-695: Use of Low-Level Functionality	PASSED
SWC-126	Insufficient Gas Griefing	CWE-691: Insufficient Control Flow Management	PASSED
SWC-125	Incorrect Inheritance Order	CWE-696: Incorrect Behavior Order	PASSED
SWC-124	Write to Arbitrary Storage Location	CWE-123: Write-what-where Condition	PASSED
SWC-123	Requirement Violation	CWE-573: Improper Following of Specification by Caller	PASSED
SWC-122	Lack of Proper Signature Verification	CWE-345: Insufficient Verification of Data Authenticity	PASSED
SWC-121	Missing Protection against Signature Replay Attacks	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SWC-120	Weak Sources of Randomness from Chain Attributes	CWE-330: Use of Insufficiently Random Values	PASSED
SWC-119	Shadowing State Variables	CWE-710: Improper Adherence to Coding Standards	PASSED
SWC-118	Incorrect Constructor Name	CWE-665: Improper Initialization	PASSED
SWC-117	Signature Malleability	CWE-347: Improper Verification of Cryptographic Signature	PASSED
SWC-116	Block values as a proxy for time	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SWC-115	Authorization through tx.origin	CWE-477: Use of Obsolete Function	PASSED
SWC-114	Transaction Order Dependence	CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')	PASSED
SWC-113	DoS with Failed Call	CWE-703: Improper Check or Handling of Exceptional Conditions	PASSED
SWC-112	Delegatecall to Untrusted Callee	CWE-829: Inclusion of Functionality from Untrusted Control Sphere	PASSED
SWC-111	Use of Deprecated Solidity Functions	CWE-477: Use of Obsolete Function	PASSED
SWC-110	Assert Violation	CWE-670: Always-Incorrect Control Flow Implementation	PASSED
SWC-109	Uninitialized Storage Pointer	CWE-824: Access of Uninitialized Pointer	PASSED
SWC-108	State Variable Default Visibility	CWE-710: Improper Adherence to Coding Standards	NOT PASSED
SWC-107	Reentrancy	CWE-841: Improper Enforcement of Behavioral Workflow	PASSED
SWC-106	Unprotected SELFDESTRUCT Instruction	CWE-284: Improper Access Control	PASSED
SWC-105	Unprotected Ether Withdrawal	CWE-284: Improper Access Control	PASSED
SWC-104	Unchecked Call Return Value	CWE-252: Unchecked Return Value	PASSED
SWC-103	Floating Pragma	CWE-664: Improper Control of a Resource Through its Lifetime	NOT PASSED
SWC-102	Outdated Compiler Version	CWE-937: Using Components with Known Vulnerabilities	PASSED
SWC-101	Integer Overflow and Underflow	CWE-682: Incorrect Calculation	PASSED
SWC-100	Function Default Visibility	CWE-710: Improper Adherence to Coding Standards	PASSED

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