

Smart Contract Security Audit V1

LP Staking Smart Contract Audit

Jun 27, 2025



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Background

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.

Project Information

- **Platform:** Binance Smart Chain
- **Name:** LPStaking
- **Language :** Solidity
- **Contract Address:** 0x36fbb2f0fabf9faef2cc9ab182caa03e9f7252fa, 0xc7055816c1c70785667cee051bc7d207e6ffb633
- **Code Source:** <https://github.com/TerraDharitri/drt-pREWA/tree/main/contracts>

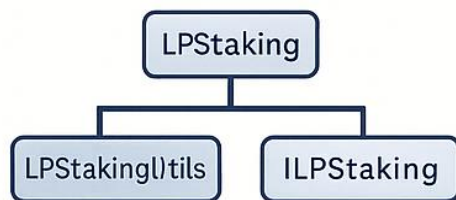
LPStaking: Earn Rewards by Staking LP Tokens



Overview

Stake LP tokens in customizable tiers to earn pREWA rewards, Sectre, upgradeable, and integrated with emergency controls.

Core Components



```
stakeLPTokens(address  
ipoken, uint256 amount,  
uint25 tierid)
```

Stake LP tokens in a pool and tier to start earning rewards.

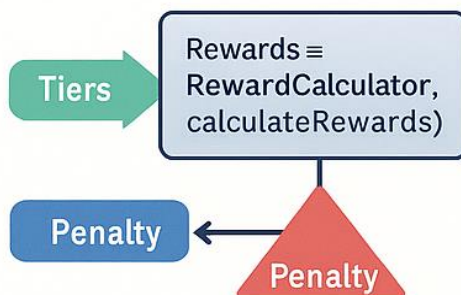
Main Functions



Safety & Governance



Staking Mechanics



Events

Usage Flow



Executive Summary

According to our assessment, the customer's solidity smart contract is **Well-Secured**.

Well Secured	✓
Secured	
Poor Secured	
Insecure	

Automated checks are with remix IDE. All issues were performed by the team, which included the analysis of code functionality, manual audit found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the audit overview section. The general overview is presented in the Project Information section and all issues found are located in the audit overview section.

Team found 0 critical, 0 high, 0 medium, 2 low, 0 very low-level issues and 2 notes in all solidity files of the contract

The files:

LPStaking.sol

Audit Score:

99% secure



File and Function Level Report

File in Scope:

Contract Name	SHA 256 hash	Contract Address
LPStaking.sol	b16b8c870fbab06a1ffdb a4c5564d2e1b0bf5271	0x36fbb2f0fabf9faef2cc9ab182caa03e9f7252fa , 0xc7055816c1c70785667cee051bc7d207e6ffb6 33

- Contract: LPStaking
- Inherit: Initializable, LPStakingUtils, ILPStaking
- Observation: All passed including security check
- Test Report: passed
- Score: passed
- Conclusion: passed

Function	Test Result	Type / Return Type	Score
accessControl	✓	Read / public	Passed
calculateLPRewards	✓	Read / public	Passed
getLiquidityManagerAddresses	✓	Read / public	Passed
checkEmergencyState	✓	Read / public	Passed
emergencyController	✓	Read / public	Passed
getEmergencyController	✓	Read / public	Passed
getLPPositionCount	✓	Read / public	Passed
getLPStakingPosition	✓	Read / public	Passed
getPoolInfo	✓	Read / public	Passed
getRewardTokenAddress	✓	Read / public	Passed
getTierInfo	✓	Read / public	Passed
isLPToken	✓	Read / public	Passed
isEmergencyPaused	✓	Read / public	Passed
pasued	✓	Read / public	Passed

claimLPRewards	✓	Write / public	Passed
renounceOwnership	✓	Write / public	Passed
transferOwnership	✓	Write / public	Passed
addTier	✓	Write / public	Passed
initialize	✓	Write / public	Passed
addPool	✓	Write / public	Passed
emergencyWithdrawLP	✓	Write / public	Passed
recoverTokens	✓	Write / public	Passed
setLPEmergencyWithdrawal	✓	Write / public	Passed
setEmergencyController	✓	Write / public	Passed
emergencyShutdown	✓	Write / public	Passed
stakeLPTokens	✓	Write / public	Passed
unstakeLPTokens	✓	Write / public	Passed
updatePool	✓	Write / public	Passed
updateTier	✓	Write / public	Passed

Issues Checking Status

SWC Attack Analysis

The Smart Contract Weakness Classification Registry (SWC Registry) is an implementation of the weakness classification scheme proposed in EIP-1470. It is loosely aligned to the terminologies and structure used in the Common Weakness Enumeration (CWE) for more info check

<https://swcregistry.io/>

No.	Issue Description	Checking Status
136	Unencrypted Private Data On-Chain	Passed
135	Code With No Effects	Passed
134	Message call with hardcoded gas amount	Passed
133	Hash Collisions With Multiple Variable Length Arguments	Passed
132	Unexpected Ether balance	Passed
131	Presence of unused variables	Passed
130	Right-To-Left-Override control character (U+202E)	Passed
129	Typographical Error	Passed
128	DoS with block gas limit.	Passed
127	Arbitrary Jump with Function Type Variable	Passed
126	Insufficient Gas Griefing	Passed
125	Incorrect Inheritance Order	Passed
124	Write to Arbitrary Storage Location	Passed
123	Requirement Violation	Passed
122	Lack of Proper Signature Verification	Passed
121	Missing Protection against Signature Replay Attacks	Passed
120	Weak Sources of Randomness from Chain Attributes	Passed
119	Shadowing State Variables	Passed

118	Incorrect Constructor Name	Passed
117	Signature Malleability	Passed
116	Block values as a proxy for time	Not Passed
115	Authorization through tx.origin	Passed
114	Transaction Order Dependence	Passed
113	DoS with Failed Call	Passed
112	Delegatecall to Untrusted Callee	Passed
111	Use of Deprecated Solidity Functions	Passed
110	Assert Violation	Passed
109	Uninitialized Storage Pointer	Passed
108	State Variable Default Visibility	Passed
107	Reentrancy	Passed
106	Unprotected SELFDESTRUCT Instruction	Passed
105	Unprotected Ether Withdrawal	Passed
104	Unchecked Call Return Value	Passed
103	Floating Pragma	Not Passed
102	Outdated Compiler Version	Passed
101	Integer Overflow and Underflow	Passed
100	Function Default Visibility	Passed

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to tokens loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have significant impact on execution
Note	Lowest-level vulnerabilities, code style violations and info statements can't affect smart contract execution and can be ignored.

Audit Findings

Critical:

No Critical severity vulnerabilities were found.

High:

No High severity vulnerabilities were found.

Medium:

No Medium severity vulnerabilities were found.

Low:

#Clarity in `getPoolInfo` Revert for Inactive Pools

Description

In `getPoolInfo`, the check `if (pool.lpTokenAddress == address(0)) { revert LPS_PoolNotActive(lpToken); }` uses `LPS_PoolNotActive` which is also used if `!pool.active`. This is slightly confusing as `lpTokenAddress == address(0)` implies the pool *doesn't exist*, not just that it's inactive

Recommendation

Create a new custom error, e.g., `LPS_PoolDoesNotExist(address lpToken)`, for cases where `pool.lpTokenAddress == address(0)`. This clearly distinguishes between a non-existent pool and an existing but inactive one. (no need in large project)

Status: [Acknowledged](#).

#Hardcoded 50000 in `addPool` and `updatePool`

Description

The magic number 50000 (for 500% APR) is hardcoded. It would be better practice to use a named constant from `Constants.sol` for clarity and easier modification.

Remediation

Define `Constants.MAX_APR_BPS_ALLOWED` in `Constants.sol` and use that instead of the literal 50000.

P.S: This issue is common to the majority of those smart contracts.

Status: [Acknowledged](#).

Very Low:

No Very Low severity vulnerabilities were found.

Notes:

#Pragma version not fixed

Description

It is a good practice to lock the solidity version for a live deployment (use 0.8.28 instead of ^0.8.28). contracts should be deployed with the same compiler version and flags that they have been tested the most with. Locking the pragma helps ensure that contracts do not accidentally get deployed using, for example, the latest compiler which may have higher risks of undiscovered bugs. Contracts may also be deployed by others and the pragma indicates the compiler version intended by the original authors. And avoid Solidity compiler Bugs check here

<https://sepolia.etherscan.io/solcbuginfo>

Remediation

Remove the ^ sign to lock the pragma version.

Use of block.timestamp for comparisons

The value of block.timestamp can be manipulated by the miner. And conditions with strict equality is difficult to achieve - block.timestamp.

```
Tier storage tier = _tiers[tierId];
    if (!tier.active) revert LPS_TierNotActive(tierId);

    uint256 startTime = block.timestamp;
    uint256 endTime = startTime + tier.duration;
```

Recommendation

Avoid use of block.timestamp.

Automatic Testing

1- SOLIDITY STATIC ANALYSIS

The screenshot displays the Solidity Static Analysis tool interface, which is divided into two main sections. The left section contains two expandable categories: 'Security' and 'Gas & Economy'. The right section contains two expandable categories: 'ERC' and 'Miscellaneous'. Each category is expanded, showing a list of checked items with their descriptions.

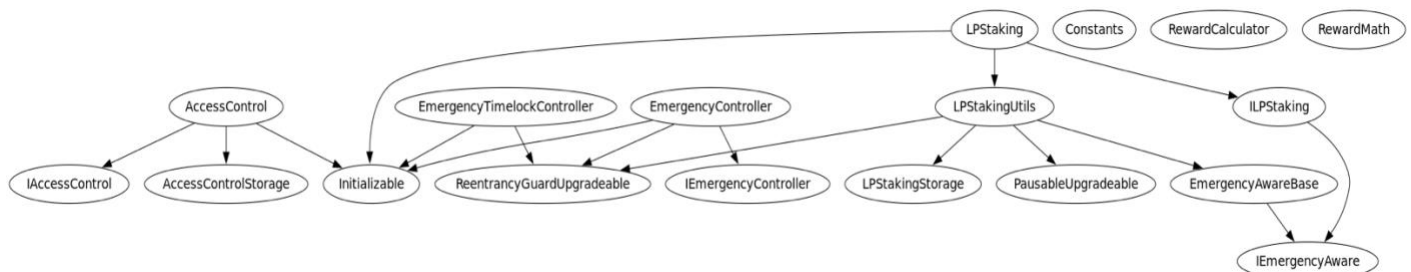
Left Panel:

- Security**
 - ☒ Select Security
 - ☒ **Transaction origin:**
'tx.origin' used
 - ☒ **Check-effects-interaction:**
Potential reentrancy bugs
 - ☒ **Inline assembly:**
Inline assembly used
 - ☒ **Block timestamp:**
Can be influenced by miners
 - ☒ **Low level calls:**
Should only be used by experienced devs
 - ☒ **Block hash:**
Can be influenced by miners
 - ☒ **Selfdestruct:**
Contracts using destructed contract can be broken
- Gas & Economy**
 - ☒ Select Gas & Economy
 - ☒ **Gas costs:**
Too high gas requirement of functions
 - ☒ **This on local calls:**
Invocation of local functions via 'this'
 - ☒ **Delete dynamic array:**
Use require/assert to ensure complete deletion
 - ☒ **For loop over dynamic array:**
Iterations depend on dynamic array's size
 - ☒ **Ether transfer in loop:**
Transferring Ether in a for/while/do-while loop

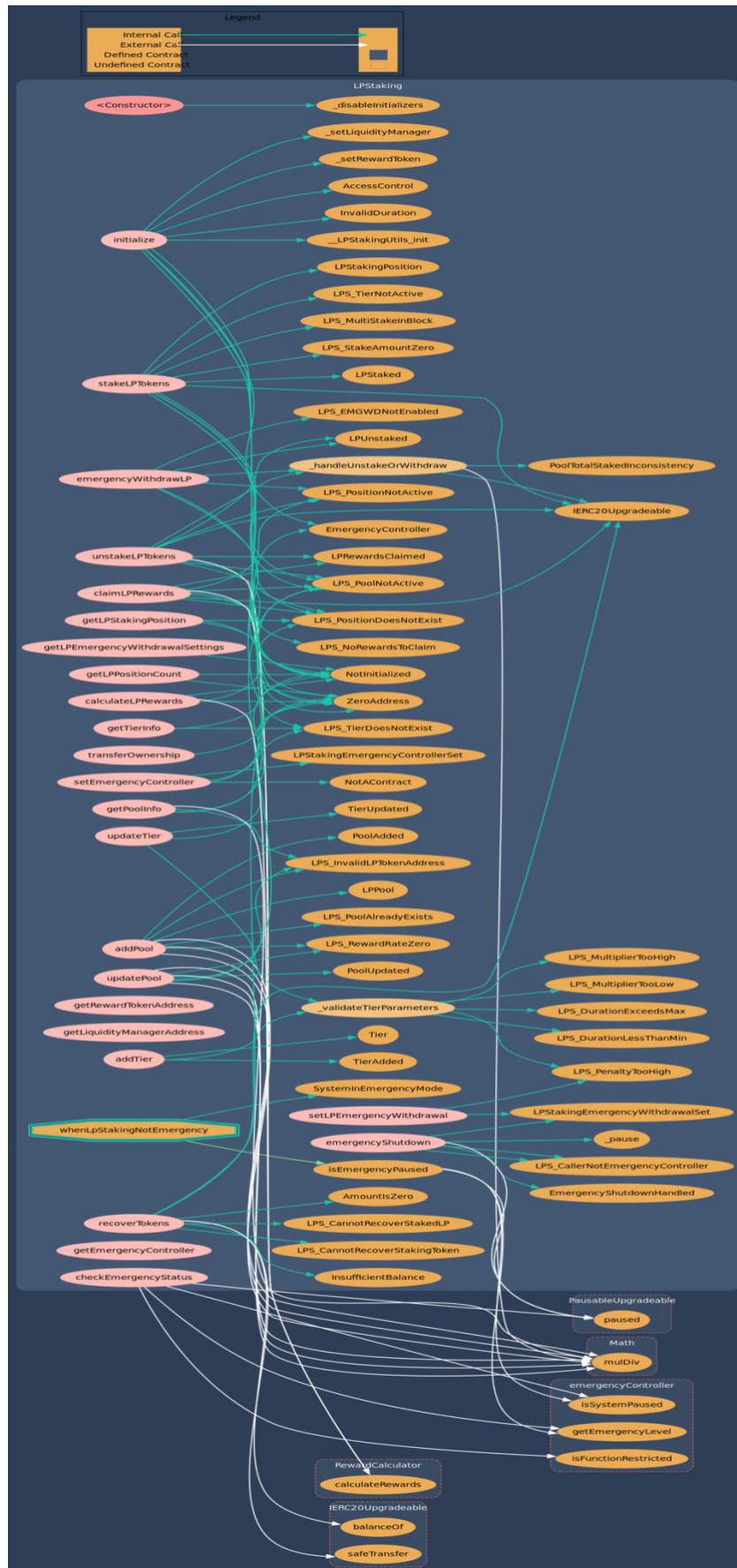
Right Panel:

- ERC**
 - ☒ Select ERC
 - ☒ **ERC20:**
'decimals' should be 'uint8'
- Miscellaneous**
 - ☒ Select Miscellaneous
 - ☒ **Constant/View/Pure functions:**
Potentially constant/view/pure functions
 - ☒ **Similar variable names:**
Variable names are too similar
 - ☒ **No return:**
Function with 'returns' not returning
 - ☒ **Guard conditions:**
Ensure appropriate use of require/assert
 - ☒ **Result not used:**
The result of an operation not used
 - ☒ **String length:**
Bytes length != String length
 - ☒ **Delete from dynamic array:**
'delete' leaves a gap in array
 - ☒ **Data truncated:**
Division on int/uint values truncates the result

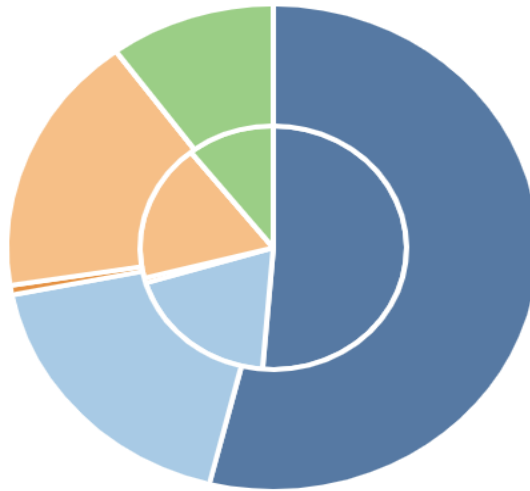
2- Inheritance graph



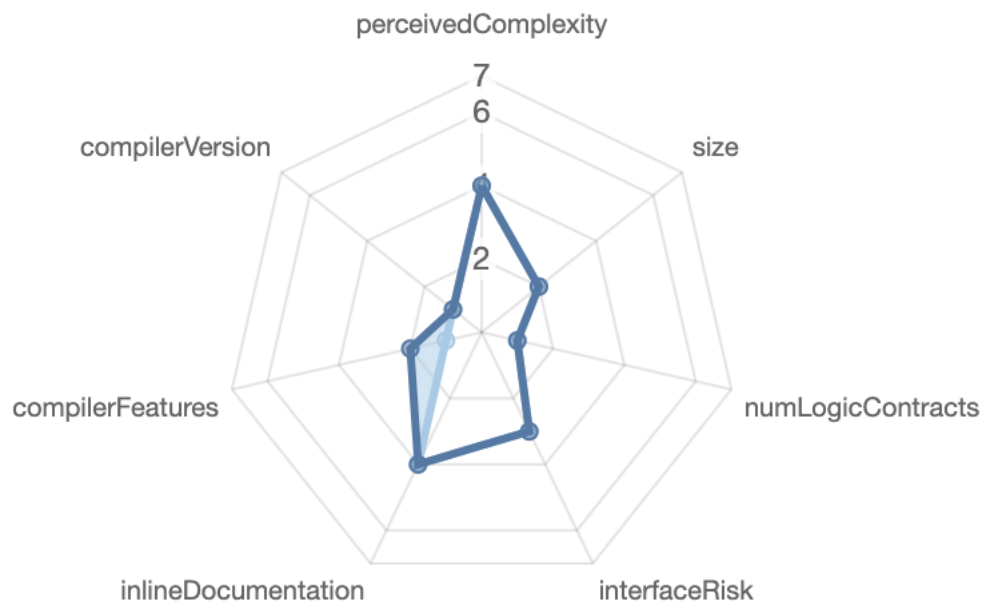
3- Call graph



Source lines



Risk level



Source units in scope

Source Units in Scope

Source Units Analyzed: 1
Source Units in Scope: 1 (100%)

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/liquidity/LPStaking.sol	1	—————	668	625	396	147	352	
	Totals	1	—————	668	625	396	147	352	

Legend: [—]

- **Lines**: total lines of the source unit
- **nLines**: normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
- **nSLOC**: normalized 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, ...)

Capabilities

Components

 Contracts	 Libraries	 Interfaces	 Abstract
1	0	0	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.

 Public	 Payable
25	0

External	Internal	Private	Pure	View
24	22	0	0	12

StateVariables

Total	 Public
4	0

Capabilities

Solidity Versions observed	 Experimental Features	 Can Receive Funds	 Uses Assembly	 Has Destroyable Contracts	
^0.8.28			yes (1 asm blocks)		
 Transfers ETH	 Low-Level Calls	 DelegateCall	 Uses Hash Functions	 ECRrecover	 New/Create/Create2

Unified Modeling Language (UML)



Functions signature

Function Name	Sighash	Function Signature
initialize	32b5a1b3	initialize(address,address,address,uint256,address,address)
stakeLPTokens	0d73eac5	stakeLPTokens(address,uint256,uint256)
unstakeLPTokens	76301350	unstakeLPTokens(uint256)
emergencyWithdrawLP	28a95ee4	emergencyWithdrawLP(uint256)
claimLPRewards	9e0ffc09	claimLPRewards(uint256)
addPool	32a9caba	addPool(address,uint256)
updatePool	76d2847f	updatePool(address,uint256,bool)
addTier	6358ec57	addTier(uint256,uint256,uint256)
updateTier	6edb9e3c	updateTier(uint256,uint256,uint256,uint256,bool)
setLPEmergencyWithdrawal	c02152f1	setLPEmergencyWithdrawal(bool,uint256)
getLPStakingPosition	79d77b42	getLPStakingPosition(address,uint256)
calculateLPRewards	babc177e	calculateLPRewards(address,uint256)
getPoolInfo	06bfa938	getPoolInfo(address)
getTierInfo	cc9d7519	getTierInfo(uint256)
getLPPositionCount	9bdc8cf5	getLPPositionCount(address)
getLPEmergencyWithdrawalSettings	4724f98f	getLPEmergencyWithdrawalSettings()
getRewardTokenAddress	99e117a0	getRewardTokenAddress()
getLiquidityManagerAddress	649f184a	getLiquidityManagerAddress()
recoverTokens	069c9fae	recoverTokens(address,uint256)
transferOwnership	f2fde38b	transferOwnership(address)
checkEmergencyStatus	8aed668a	checkEmergencyStatus(bytes4)
emergencyShutdown	eb1676c1	emergencyShutdown(uint8)
getEmergencyController	c993cc9d	getEmergencyController()
setEmergencyController	6ca7dc89	setEmergencyController(address)
isEmergencyPaused	290d10c4	isEmergencyPaused()

Automatic general report

Files Description Table

File Name	SHA-1 Hash
/Users/macbook/Desktop/drt-pREWA/contracts/liquidity/LPStaking.sol	b16b8c870fbab06a1ffdba4c5564d2e1b0bf5271
/Users/macbook/Desktop/drt-pREWA/contracts/liquidity/LPStakingUtils.sol	7a911bbd47adf0dea8a6f15682baca0315dd624d
/Users/macbook/Desktop/drt-pREWA/contracts/liquidity/storage/LPStakingStorage.sol	e47a8a8093d56ea9d91e40f0da0daa37e9eca488
/Users/macbook/Desktop/drt-pREWA/contracts/access/AccessControl.sol	40163fa249f10365c03cf1fa9ddd26e2f6eb1005
/Users/macbook/Desktop/drt-pREWA/contracts/access/storage/AccessControlStorage.sol	2a1f4c3d6956a89011b090a62b15254b1d720d65
/Users/macbook/Desktop/drt-pREWA/contracts/access/interfaces/IAccessControl.sol	540ec54eaade1c05a650af086ebf959654ec6322
/Users/macbook/Desktop/drt-pREWA/contracts/libraries/Errors.sol	0974f6f49e3b655fa93a2792154f1b506ec03c74
/Users/macbook/Desktop/drt-pREWA/contracts/controllers/EmergencyController.sol	8e73765eaa98f95db8f5eb7a40cd13b0dc845266
/Users/macbook/Desktop/drt-pREWA/contracts/interfaces/IEmergencyAware.sol	be6e0a371b0a5f62d5c7dc06e5c0c4121dcc7ca1
/Users/macbook/Desktop/drt-pREWA/contracts/interfaces/IEmergencyController.sol	40bc149ec8a1da85c0e4c6170b06f3a0f3b77f3b
/Users/macbook/Desktop/drt-pREWA/contracts/controllers/EmergencyTimelockController.sol	94735e88ad7f750ead488b7ad618b1486cbdb483
/Users/macbook/Desktop/drt-pREWA/contracts/libraries/Constants.sol	62835a8af9d7ab21c0cad9ca03abff6cf4e8e68f
/Users/macbook/Desktop/drt-pREWA/contracts/utils/EmergencyAwareBase.sol	528be04847c5d3cf03edd961c878359eb3cafc6a
/Users/macbook/Desktop/drt-pREWA/contracts/liquidity/RewardCalculator.sol	1d401552a8f819cb277657b7fa2c5d86f5cd6928
/Users/macbook/Desktop/drt-pREWA/contracts/libraries/RewardMath.sol	364dab3e9f83972a6b43d70f4c87cbf95548b475
/Users/macbook/Desktop/drt-pREWA/contracts/liquidity/interfaces/ILPStaking.sol	1d6ac7c073fd6eaf9ec371c2bdd3ce42cf4037c8

Contracts Description Table

Contract	Type	Bases
:-----: :-----: :-----: :-----:		
:-----:		
L	**Function Name**	**Visibility** **Mutability**
Modifiers		
LPStaking Implementation Initializable, LPStakingUtils, ILPStaking		
L	<Constructor> Public !	NO !
L	initialize External !	initializer
L	stakeLPTokens External !	nonReentrant
whenLpStakingNotEmergency		
L	_handleUnstakeOrWithdraw Internal	
L	unstakeLPTokens External !	nonReentrant
L	emergencyWithdrawLP External !	nonReentrant
L	claimLPRewards External !	nonReentrant
whenLpStakingNotEmergency		
L	addPool External !	onlyParameterRole nonReentrant
L	updatePool External !	onlyParameterRole nonReentrant
L	_validateTierParameters Internal	
L	addTier External !	onlyParameterRole nonReentrant
L	updateTier External !	onlyParameterRole nonReentrant
L	setLPEmergencyWithdrawal External !	onlyOwner
nonReentrant		
L	getLPStakingPosition External !	NO !
L	calculateLPRewards External !	NO !
L	getPoolInfo External !	NO !
L	getTierInfo External !	NO !
L	getLPPositionCount External !	NO !
L	getLPEmergencyWithdrawalSettings External !	NO !
L	getRewardTokenAddress External !	NO !
L	getLiquidityManagerAddress External !	NO !
L	_setRewardToken Internal	
L	_setLiquidityManager Internal	
L	recoverTokens External !	onlyOwner nonReentrant
L	transferOwnership External !	onlyOwner nonReentrant
L	checkEmergencyStatus External !	NO !
L	emergencyShutdown External !	NO !
L	getEmergencyController External !	NO !
L	setEmergencyController External !	onlyOwner
L	isEmergencyPaused Public !	NO !
LPStakingUtils Implementation LPStakingStorage, PausableUpgradeable, ReentrancyGuardUpgradeable, EmergencyAwareBase		
L	__LPStakingUtils_init Internal	onlyInitializing
LPStakingStorage Implementation		

```

| **AccessControl** | Implementation | Initializable,
AccessControlStorage, IAccessControl |||
| L | <Constructor> | Public ! |  | NO! |
| L | initialize | External ! |  | initializer |
| L | hasRole | External ! | | NO! |
| L | getRoleAdmin | External ! | | NO! |
| L | grantRole | External ! |  | NO! |
| L | revokeRole | External ! |  | NO! |
| L | renounceRole | External ! |  | NO! |
| L | setRoleAdmin | External ! |  | NO! |
| L | getRoleMember | External ! | | NO! |
| L | getRoleMemberCount | External ! | | NO! |
| L | getRoleMembersPaginated | External ! | | NO! |
| L | _grantRole | Internal  |  | |
| L | _revokeRole | Internal  |  | |
| L | _setRoleAdmin | Internal  |  | |
|||||
| **AccessControlStorage** | Implementation | |||
|||||
| **IAccessControl** | Interface | |||
| L | hasRole | External ! | | NO! |
| L | getRoleAdmin | External ! | | NO! |
| L | grantRole | External ! |  | NO! |
| L | revokeRole | External ! |  | NO! |
| L | renounceRole | External ! |  | NO! |
| L | getRoleMember | External ! | | NO! |
| L | getRoleMemberCount | External ! | | NO! |
| L | getRoleMembersPaginated | External ! | | NO! |
|||||
| **EmergencyController** | Implementation | Initializable,
ReentrancyGuardUpgradeable, IEmergencyController |||
| L | <Constructor> | Public ! |  | NO! |
| L | initialize | External ! |  | initializer |
| L | setRequiredApprovals | External ! |  | onlyAdminRole |
| L | setLevel3TimelockDuration | External ! |  | onlyAdminRole |
| L | setRecoveryAdminAddress | External ! |  | onlyAdminRole |
| L | approveLevel3Emergency | External ! |  | onlyEmergencyRole
nonReentrant |
| L | cancelLevel3Emergency | External ! |  | onlyEmergencyRole
nonReentrant |
| L | executeLevel3Emergency | External ! |  | onlyEmergencyRole
nonReentrant |
| L | setEmergencyLevel | External ! |  | onlyEmergencyRole
nonReentrant |
| L | enableEmergencyWithdrawal | External ! |  | onlyEmergencyRole
nonReentrant |
| L | pauseSystem | External ! |  | onlyPauserRole nonReentrant |
| L | unpauseSystem | External ! |  | onlyPauserRole nonReentrant |
| L | recoverTokens | External ! |  | onlyEmergencyRole nonReentrant
|

```

```

| L | registerEmergencyAwareContract | External ! | 🔒 |
onlyEmergencyRole |
| L | removeEmergencyAwareContract | External ! | 🔒 |
onlyEmergencyRole |
| L | processEmergencyForContract | External ! | 🔒 | nonReentrant |
| L | updateFunctionRestriction | External ! | 🔒 | onlyEmergencyRole |
| L | getEmergencyLevel | External ! | |NO! |
| L | getEmergencyWithdrawalSettings | External ! | |NO! |
| L | isSystemPaused | External ! | |NO! |
| L | getEmergencyAwareContractsPaginated | External ! | |NO! |
| L | getApprovalStatus | External ! | |NO! |
| L | isFunctionRestricted | External ! | |NO! |
| L | _resetApprovals | Internal 🔓 | 🔒 |
|||||
| **IEmergencyAware** | Interface | |||
| L | checkEmergencyStatus | External ! | |NO! |
| L | emergencyShutdown | External ! | 🔒 |NO! |
| L | getEmergencyController | External ! | |NO! |
| L | setEmergencyController | External ! | 🔒 |NO! |
| L | isEmergencyPaused | External ! | |NO! |
|||||
| **IEmergencyController** | Interface | |||
| L | setEmergencyLevel | External ! | 🔒 |NO! |
| L | enableEmergencyWithdrawal | External ! | 🔒 |NO! |
| L | pauseSystem | External ! | 🔒 |NO! |
| L | unpauseSystem | External ! | 🔒 |NO! |
| L | recoverTokens | External ! | 🔒 |NO! |
| L | getEmergencyLevel | External ! | |NO! |
| L | getEmergencyWithdrawalSettings | External ! | |NO! |
| L | isSystemPaused | External ! | |NO! |
| L | getEmergencyAwareContractsPaginated | External ! | |NO! |
|||||
| **EmergencyTimelockController** | Implementation | Initializable,
ReentrancyGuardUpgradeable |||
| L | <Constructor> | Public ! | 🔒 |NO! |
| L | initialize | External ! | 🔒 | initializer |
| L | setAllowedTarget | External ! | 🔒 | onlyEmergencyRole |
| L | setAllowedFunctionSelector | External ! | 🔒 | onlyEmergencyRole
|
| L | proposeEmergencyAction | External ! | 🔒 | onlyEmergencyRole
nonReentrant |
| L | executeEmergencyAction | External ! | 🔒 | onlyEmergencyRole
nonReentrant |
| L | cancelEmergencyAction | External ! | 🔒 | onlyEmergencyRole
nonReentrant |
| L | updateTimelockDuration | External ! | 🔒 | onlyEmergencyRole |
| L | getActionStatus | External ! | |NO! |
| L | getAllActionIds | External ! | |NO! |
| L | getActionDetails | External ! | |NO! |
| L | isFunctionSelectorAllowed | External ! | |NO! |
| L | isTargetAllowed | External ! | |NO! |

```

```

||||| |
| **Constants** | Library | |||
|||||
| **EmergencyAwareBase** | Implementation | IEmergencyAware |||
| L | _isEffectivelyPaused | Internal 🔒 | | |
|||||
| **RewardCalculator** | Library | |||
| L | calculateRewards | Public ⚠️ | | NO⚠️ |
|||||
| **RewardMath** | Library | |||
| L | calculateReward | Internal 🔒 | | |
| L | calculateAPR | Internal 🔒 | | |
|||||
| **ILPStaking** | Interface | IEmergencyAware |||
| L | initialize | External ⚠️ | 🔒 | NO⚠️ |
| L | stakeLPTokens | External ⚠️ | 🔒 | NO⚠️ |
| L | unstakeLPTokens | External ⚠️ | 🔒 | NO⚠️ |
| L | claimLPRewards | External ⚠️ | 🔒 | NO⚠️ |
| L | emergencyWithdrawLP | External ⚠️ | 🔒 | NO⚠️ |
| L | addPool | External ⚠️ | 🔒 | NO⚠️ |
| L | updatePool | External ⚠️ | 🔒 | NO⚠️ |
| L | addTier | External ⚠️ | 🔒 | NO⚠️ |
| L | updateTier | External ⚠️ | 🔒 | NO⚠️ |
| L | setLPEmergencyWithdrawal | External ⚠️ | 🔒 | NO⚠️ |
| L | getLPStakingPosition | External ⚠️ | | NO⚠️ |
| L | calculateLPRewards | External ⚠️ | | NO⚠️ |
| L | getPoolInfo | External ⚠️ | | NO⚠️ |
| L | getTierInfo | External ⚠️ | | NO⚠️ |
| L | getLPPositionCount | External ⚠️ | | NO⚠️ |
| L | getLPEmergencyWithdrawalSettings | External ⚠️ | | NO⚠️ |

```

Legend

Symbol	Meaning
:-----:	-----
🔒	Function can modify state
💰	Function is payable

Conclusion

The contracts are written systematically. Team found no critical issues. So, it is good to go for production.

Since possible test cases can be unlimited and developer level documentation (code flow diagram with function level description) not provided, for such an extensive smart contract protocol, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan Everything.

Security state of the reviewed contract is “Well Secured”.

- ✓ No volatile code.
- ✓ No high severity issues were found.

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of 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 the team on the basis of what it says or doesn't say, or how team produced it, and it is important for you to conduct your own independent investigations before making any decisions. team go into more detail on this in the below disclaimer below – please make sure to read it in full.

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